

Flood Risk Management (Scotland) Act 2009:

Shetland Local Plan District

Local Flood Risk Management Plan



Delivering sustainable flood risk management is important for Scotland's continued economic success and well-being. It is essential that we avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities.



This is the first local flood risk management plan for the Shetland Local Plan District, describing the actions which will make a real difference to managing the risk of flooding and recovering from any future flood events.

The task now for us – Shetland Islands Council, Scottish Water, the Scottish Environment Protection Agency (SEPA), the Scottish Government and all other Responsible Authorities and public bodies – is to turn our plan into action.



Foreword

The impacts of flooding experienced by individuals, communities and businesses can be devastating and long lasting. It is vital that we continue to reduce the risk of any such future events and improve Scotland's ability to manage and recover from any events which do occur.

The publication of this Plan is an important milestone in implementing the Flood Risk Management (Scotland) Act 2009 and improving how we cope with and manage floods in the Shetland Local Plan District. The Plan translates this legislation into actions to reduce the damage and distress caused by flooding over the first planning cycle from 2016 to 2022.

The Plan has been developed by the Shetland Local Plan District Partnership, which is comprised of the Shetland Islands Council, Scottish Water and SEPA. The partnership is led by the Shetland Islands Council, who have published this Plan.

In summary, three Potentially Vulnerable Areas have been identified across the Shetland Local Plan District. These include 18 residential and 18 non-residential properties at risk of flooding. The estimated Annual Average Damage from this flood risk is £181,000.

This Plan presents actions to avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities within these Potentially Vulnerable Areas and across the Local Plan District. These actions include 3 flood protection studies, to gather more information in areas of potential flood risk, as well as a Surface Water Management Plan and awareness raising. The delivery of many of these actions may be dependent on the availability of funding, however, we can all play our part in managing flood risk as we are able.

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. The publication of this Plan shows that the coordinated and collaborative efforts of public bodies can be brought together to deliver sustainable outcomes. However, the actions in this Plan can only be delivered with the support of all the public bodies, The Scottish Government, and most importantly you and your communities.

This Plan therefore provides the blueprint upon which the Council, SEPA and Scottish Water will deliver their flood risk management responsibilities and, in particular, ensures that all steps should be taken to manage flooding in a sustainable manner.

I would like to thank all those who contributed to the development of this Plan which will help shape the way in which floods and their impacts are managed across the Shetland Local Plan District.

Cllr Billy Fox
Shetland LPDP Elected member representative

Contents

List of Acronyms and Abbreviations	5
1: Flood Risk Management in the Shetland Local Plan District.....	7
1.1 The Shetland Local Flood Risk Management Plan	7
1.2 How to read this plan	8
1.3 How we have developed the Plan?	9
1.4 Links with other plans, policies, strategies and legislative requirements	13
1.5 Next steps and monitoring progress	15
1.6 Licensing acknowledgements	15
2: Managing Flood Risk in the Shetland Local Plan District	16
2.1 Understanding of flooding within the Shetland Local Plan District	16
2.2 Local Plan District Summary	17
2.3 Local Plan District Overview	20
2.4 Potentially Vulnerable Areas	29
2.5 Flood risk, objectives, actions and prioritisation for Shetland North Mainland (PVA 04/01).....	30
2.6 Flood risk, objectives, actions and prioritisation for Shetland West Mainland (PVA 04/02).....	44
2.7 Flood risk, objectives, actions and prioritisation for Shetland Central and South Mainland (PVA 04/03).....	58
Annex 1: Shetland LFRMP Actions.....	80
Annex 2: LPD roles & responsibilities.....	82
Annex 3: Consultation and engagement	85
Annex 4: Links to other plans, policies, strategies and legislative requirements	87
Annex 5: Land Use Planning.....	88
Annex 6: Supporting information	90
Annex 7: Licensing information.....	94
Glossary	96

List of Acronyms and Abbreviations

AAD - Annual Average Damages

BCR - Benefit Cost Ratio

CoSLA - Convention of Scottish Local Authorities

EIA - Environmental Impact Assessment

FPS - Flood Prevention Scheme / Flood Protection Scheme

FRA - Flood Risk Assessment

FRM Act - Flood Risk Management (Scotland) Act 2009

FRMP - Flood Risk Management Plans

FRM LAG - Flood Risk Management Local Advisory Group

FRMS - Flood Risk Management Strategy

HRA – Habitat Regulations Appraisal

LUP - Land Use Planning

LLA - Lead Local Authority

LFRMP - Local Flood Risk Management Plans

LNR - Local Nature Reserve

LPD - Local Plan District

LPDP - Local Plan District Partnerships

NFMAG - National Flood Management Advisory Group

NFRA - National Flood Risk Assessment

NFM - Natural Flood Management

PVA - Potentially Vulnerable Areas

PLP - Property Level Protection

Q&S - Quality and Standards (Q&S) is the process, governing costs and outputs, through which the planning and delivery of improvements to the public drinking water and sewerage services in Scotland is carried out.

RBMP - River Basin Management Planning

SAIFF - Scottish Advisory and Implementation Forum for Flooding

SMP - Shoreline Management Plan

SSSI - Site of Special Scientific Interest

SAC - Special Area of Conservation

SPA - Special Protection Areas

SoP - Standard of Protection

SEA - Strategic Environmental Assessment

SEPA – Scottish Environment Protection Agency

SEPF - Shetland Emergency Planning Forum

SFRA - Strategic Flood Risk Assessment

SIC – Shetland Islands Council

SNH – Scottish Natural Heritage

SWMP - Surface Water Management Plan

SuDS - Sustainable Drainage Systems

UKCP09 - UK Climate Change Projections

1: Flood Risk Management in the Shetland Local Plan District

1.1 The Shetland Local Flood Risk Management Plan

The Shetland Local Flood Risk Management Plan (the 'Plan') has been developed to detail the actions adopted to reduce the devastating and costly impact of flooding in the Shetland Local Plan District. The Plan supplements the Shetland Flood Risk Management Strategy (the 'Strategy'), which coordinates the efforts of all organisations that tackle flooding, whether it is in our towns, villages or rural areas and whether it is from rivers, the sea or from surface water. The Strategy identifies where the risk of flooding and benefits of investment are greatest: the Plan also details the prioritised actions that will be delivered with this investment.

By publishing the Plan, individuals and communities have the information to better manage their own responsibilities. Everyone can take action with the confidence of what others are doing and with the clear knowledge when they are doing it.

The Plan details how and when the actions to deliver the goals set in the Strategy are to be delivered in the first six-year planning cycle, from 2016 to 2022. The Plan therefore describes the short-term direction of flood risk management in the Shetland Local Plan District, adding local detail to the information in the Strategy. The actions in this Plan are based on agreed objectives for tackling floods in highest risk areas. They rely on the best evidence available on the causes and consequences of flooding and make clear the practical ambition of Responsible Authorities, including the Shetland Islands Council, SEPA and Scottish Water.

It is through this risk-based and plan-led approach that flood management will improve for the individuals, communities and businesses at risk in the Shetland Local Plan District.

The Plan is published by Shetland Islands Council, lead authority for the Shetland Local Plan District. The Plan has been prepared in collaboration with SEPA and Scottish Water. The Plan is a requirement under the Flood Risk Management (Scotland) Act 2009 and fulfils requirements within the European Union's Floods Directive.

1.2 How to read this plan

The Shetland Local Flood Risk Management Plan has three sections:

Part 1 contains background information on the approach taken in Scotland to manage flooding. It explains the duties and aims of relevant organisations, including how they work together and how flood risk management planning is linked to other government policies and initiatives. Most importantly it details how flood risk management planning is delivered to each Local Plan District through a Local Flood Risk Management Plan.

Part 2 is the most important section for those individuals and communities seeking to understand their flood risk and its management. For priority communities (called Potentially Vulnerable Areas) there is a short description of the causes and consequences of flooding. The agreed goals or objectives are clearly set out, and, most importantly, the actions that will deliver progress against these goals over the first six-year planning cycle from 2016 to 2022 are described, including when they will be implemented, which organisation is responsible, and how they are to be funded.

Annexes to the Plan provide supporting documents and references, and present more detailed information in various formats. A glossary of terms is also available.

The Plan should be read alongside the Strategy for the Shetland Local Plan District. The Strategy has been developed in parallel and provides additional background information and national context. The publication date of the Strategy was December 2015. Both the Plan and the Strategy will be updated every six years – see chapter 1.5 of the Plan.

1.3 How we have developed the Plan?

Coordination, collaboration and partnership working

Many organisations and individuals are involved in helping to improve flood management in Scotland. A piecemeal approach to tackle flooding does not work. Flooding is too complex, and the causes and impacts too complicated for any single organisation to address alone. Flooding cuts across the responsibilities of organisations such as the Shetland Islands Council, SEPA, Scottish Water and emergency responders and flood management requires the coordination set out in this Plan (and parallel Strategy) to be successful. A willingness to collaborate by those responsible for flood management is essential.

The Plan has been developed in partnership. Those organisations responsible are working more closely together than ever before. In local partnerships, here and throughout Scotland, SEPA has provided the technical analysis and ensured a consistent national approach is taken. It has provided the evidence upon which to make sensible, informed decisions. The Shetland Islands Council and Scottish Water have made sure that local knowledge and expertise has informed the decision-making.

The Plan has been developed by:

- Shetland Islands Council (lead authority)
- Scottish Water
- SEPA

Roles and responsibilities for Flood Risk Management Planning

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life.

However, the responsibility for planning flood risk management in the Shetland LPD falls in the main to the Shetland Islands Council, SEPA and Scottish Water.

Shetland Islands Council has the responsibility to produce a Local Flood Risk Management Plan. It is the responsibility of Shetland Islands Council to implement the range of different flood protection actions agreed within the Plan. During severe flooding, Shetland Islands Council will work with the emergency services and coordinate shelter for people evacuated from their homes.

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. SEPA has a statutory duty to produce Scotland's Flood Risk Management Strategies. They work closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to

ensure that a nationally consistent approach to flood risk management is adopted. SEPA also has a responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced.

Scottish Water is a Responsible Authority for flood risk management and is working closely with SEPA, local authorities and others to coordinate plans to manage flood risk. Scottish Water has the public drainage duty and is responsible for foul drainage and the drainage of rainwater run-off from roofs and any paved ground surface from the boundary of properties. Additionally, Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. Scottish Water is not responsible for private pipework or guttering within the property boundary.

Further detailed on some of the key roles are outlined in Annex 2.

Consultation, engagement and advice

Shetland Islands Council and SEPA have been keen to hear from the people and communities that live under the threat of flooding, to ensure that our technical analysis of the risks is accurate and that efforts to manage flooding are targeted to where most can be achieved. Two statutory public consultations were held during the development of the Strategies and Plans. The first, by SEPA, was on the general approach to flood risk management planning and the identification of priority areas (2011); the second, held jointly with SEPA and the Council, was on better understanding flooding in these priority areas and on the objectives and actions needed to manage flooding (2015). The views and representations of the respondents to the second consultation were taken account of in developing and finalising the Plan.

Further advice has been sought from relevant organisations at key stages. The Strategies (and Plans) have benefitted from input from the Shetland Local Advisory Group, providing important area-based knowledge on both the causes and consequences of flooding and on the appropriate actions for future management. Advice was also taken from a National Flood Management Advisory Group consisting of over 50 member organisations, reflecting the national importance and impact of flooding on our communities, economy, environment and cultural heritage.

Some of the work carried out has been complex and technical in nature for which professional advice was sought from across Scotland and beyond. Working together, SEPA, The Scottish Government, Shetland Islands Council, Scottish Water and other key interested organisations have assisted each other and developed industry best practice guidance for flood risk management planning.

Identification of objectives, appraisal and prioritisation of actions

Nationally the identification of objectives and appraisal of actions to reduce flood risk has been led by SEPA with significant local input from local authorities and Scottish Water. The setting of objectives and selecting the most sustainable actions to reduce flood risk in each Local Plan District will provide the long-term vision for Flood Risk Management in Scotland. Objectives set focus on the main sources and impacts of flooding identified for each Potentially Vulnerable Area in every Local Plan District. A wide range of actions were appraised, including flood protection works and schemes, flood protection studies, flood warning schemes, surface water management plans, and natural flood management studies and works.

To prioritise future actions across Scotland, as required in flood risk management planning, SEPA separated the technical, risk-based assessment of priorities from aspects of local, practical deliverability. In this way the data on the costs and impacts of actions is used alongside information from delivery and funding bodies to jointly agree priorities and identify indicative delivery dates for actions. A National Prioritisation Advisory Group was established to provide guidance to SEPA on the priority of flood risk management actions, having considered both the technical ranking prepared by SEPA and issues of local priority. This group was made up of representatives from SEPA, local authorities, CoSLA and Scottish Water.

The Strategy provides the list of prioritised actions for the first six-year flood risk management planning cycle, 2016 to 2022. The Plan identifies who will be responsible for each of the actions, a timetable of when they will be undertaken and the funding arrangements – see part 2.

The Act requires Scottish Government to have regard to the Strategy and Local Flood Risk Management Plan when allocating funding to SEPA and Responsible Authorities. The delivery of the actions in the first Flood Risk Management Plan cycle from 2016-2022, as detailed in the Local Flood Risk Management Plan, is therefore subject to revenue and capital funding allocations from Scottish Government to SEPA and Responsible Authorities; and to revenue and capital budget setting by councils and other Responsible Authorities over the period 2016-2022.

Strategic Environmental Assessment and Habitats Regulations Appraisal

A Strategic Environmental Assessment has been undertaken for the Flood Risk Management Strategy which has informed the Plan. A SEA screening of the LFRMP was submitted to ascertain whether further assessment was required. The consultation responses agreed with the Council's view that the actions detailed in the Plan did not exceed the scope of proposals already considered in the SEA of the Strategy. Project level impact assessments will be undertaken if this is required for works resulting from the Plan to comply with planning and environmental regulations.

Shetland Islands Council also undertook a Habitats Regulations Appraisal to ensure that the Plan will not have a likely significant effect on the integrity of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Scottish Natural Heritage was consulted on the Appraisal and their views have been taken into account. Mitigation will be applied where required to ensure that the actions in Plan will not adversely affect the integrity or conservation objectives of any SPA or SAC.

Post-consultation communication and engagement

Feedback was received in early 2015 during public consultation on draft versions of the Flood Risk Management Strategy documents. The issues raised then were in regard to areas being covered under this Shetland Flood Risk Management Plan, with some of the specific concerns highlighted being particular issues which are to be addressed in the Surface Water Management Plan (SWMP).

Both the Flood Risk Management Strategy and the Local Flood Risk Management Plan documents were developed through the Shetland Local Plan District Partnership working group, with close coordination with the local Shetland Flood Risk Management Local Advisory Group.

1.4 Links with other plans, policies, strategies and legislative requirements

The Plan does not stand in isolation. As far as is practicable, an integrated approach to land and water management has been pursued. When developing the Strategy and the Plan, early links were made with other relevant aspects of water and land management including Local Development Plans, River Basin Management Plans and Emergency plans. In turn, the Responsible Authorities will work proactively to ensure the findings from these Flood Risk Management Plans and Strategies will influence other planning initiatives in an interactive and iterative cycle. Making these links has helped identify opportunities to deliver multiple benefits from flood risk management goals, objectives and actions.

River Basin Management Planning

Reducing flood risk in Scotland through the development of Flood Risk Management Strategies has provided an opportunity to connect with plans to improve the quality of Scotland's water environment at the same time. For example, coordination between river basin management and flood risk management can reduce flood risk, whilst improving water quality and biodiversity.

SEPA is leading the delivery of River Basin Management Plans and Flood Risk Management Strategies, and local authorities for Local Flood Risk Management Plans, and they have worked to ensure that there is integration and coordination between them. This coordination, particularly in regard to consultation and engagement, will be important for stakeholders many of whom have an interest in the objectives of both Plans and Strategies.

Scottish Water Business Plan 2015-2021

Scottish Water's investment programme is set out in their business plan 2015-2021, which can be found on their website [<https://www.scottishwater.co.uk/about-us/publications/strategic-projections>].

Scottish Water's customers have told them that reducing internal property flooding from sewers is a high priority and this is reflected in Scottish Water's Business Plan commitments for the period 2015-21. Addressing sewer flooding is of the highest importance to Scottish Water, as highlighted by our customers who have helped shape the investment plans for 2015-21.

In recognition of this high priority, within the period 2015-2021, Scottish Water will invest c£115m to improve the hydraulic capability of the sewer network so that they can remove all customers from the high risk internal sewer flooding register (greater than 10% chance per annum) as quickly as possible, typically within four years of their problem being confirmed. Scottish Water has made a commitment to those customers on the register on 31 March 2015 that they will no longer be on the register by 31 March 2021.

Scottish Water Customers have also highlighted external flooding is an important issue. As a result, within the period 2015-2021, they are investing c£40m to develop and to begin to implement solutions to reduce the flood risk for 400 high priority external sewer flooding areas suffering from frequent repeat flooding events.

As a Responsible Authority under the Flood Risk Management (Scotland) Act 2009, Scottish Water is also working collaboratively with third parties such as SEPA and Local Authorities through the Flood Risk Management Planning process which will assess the risk of flooding into the future.

As part of that work, Scottish Water has allocated investment to undertake further modelling and assessment in sewer catchments within PVA's to improve knowledge and understanding of flood risk from the sewers in these areas, as required under Section 16 of the Flood Risk Management (Scotland) Act 2009. Work carried out under these Flood Risk Management (Scotland) Act 2009 duties will continue to inform future investment requirements for Scottish Water.

Surface Water Management Planning

Surface water flooding is experienced in all Plan areas and is a key component of the flood risk assessment that has led to the development of this Plan. Many of the actions in the Plan seek to reduce general surface water flood risks but specific Surface Water Plans will be produced to look in more detail at locally specific problems in Lerwick and Scalloway.

Shetland Islands Council proposes to undertake a Surface Water Management Plan over the period of the first FRM cycle. This is in PVA 04/03, the Shetland South Mainland area, and has two priority areas, Lerwick and Scalloway, which are described in more detail in section 2.7, which covers the proposed actions for that PVA.

1.5 Next steps and monitoring progress

The Plan runs for six years from June 2016. Over this period the Shetland LPD partnership will continue to meet periodically to monitor progress towards implementing the actions detailed in Chapter 2 and Annex 1 of the Plan.

Between years 2 and 3 of the FRM cycle (i.e. before June 2019), Shetland Islands Council, as lead authority will publish a report on the conclusions of a review of the Plan, including information on the progress that has been made towards implementing the measures identified in the implementation part of the Plan.

Between years 5 and 6 of the FRM cycle (i.e. before June 2022), Shetland Islands Council, as lead authority will publish a report on the Plan containing an assessment of the progress made towards implementing the current measures, a summary of the current measures which were not implemented, with reasons for their non-implementation, and a description of any other measures implemented since the plan was finalised which the Council considers have contributed to the achievement of the objectives summarised in the Plan.

The Shetland Islands Council will make these reports available for public inspection.

1.6 Licensing acknowledgements

Full licensing acknowledgements can be found in Annex 7 of this Plan.

2: Managing Flood Risk in the Shetland Local Plan District

2.1 Understanding of flooding within the Shetland Local Plan District

This part of the plan presents the summaries of flooding for the Shetland Local Plan District and for the 3 Potentially Vulnerable Areas (PVAs). Planned actions to gather more information on how to manage flooding that have been prioritised for delivery between 2016 and 2022 across the whole of the LPD area and in each PVA are detailed. It identifies who will be responsible for the delivery and implementation of the actions, along with a timetable of when the actions will be undertaken and the funding arrangements.

This part of the plan summarises the characteristics and impacts of flooding from river, coastal and surface water sources on the Shetland Local Plan District and how flooding from these mechanisms are to be managed, which are described in more detail in the Strategy.

Sections 2.2 and 2.3 present a LPD summary and overview respectively. Sections 2.4 to 2.7 present actions by PVA, while section 2.8 describes other flood risk activities undertaken the Shetland Islands Council in this Local Plan District. Together these provide as full a picture as possible of how flood risk is managed in the Shetland LPD.

2.2 Local Plan District Summary



Figure 2.1: The Shetland catchment group
 Reproduced from *Shetland Flood Risk Management Strategy*, SEPA (December 2015)

In the Shetland Local Plan District, reports for river, coastal and surface water cover the whole Local Plan District.

A summary of the number of properties and Annual Average Damages from river, coastal and surface water flooding is outlined in Table 2.1.

Table 2.1: Summary of flood risk from various sources within the Shetland Local Plan District

	Total number of properties at risk ¹	Annual Average Damages
Shetland Islands, river catchments	10	£55,000
Shetland Islands, coastal areas	50	£350,000
Shetland Islands, surface water flooding	20	£30,000

¹ Total number of residential and non-residential properties at risk of flooding

There are approximately 30 residential properties and 50 non-residential properties at risk of flooding within the Local Plan District. This is less than 1% of all properties in Shetland.

The 3 PVAs within the Shetland LPD contain approximately 20 of the 30 residential properties at flood risk, and approximately 20 of the 50 non-residential properties at flood risk. The PVAs cover approximately £180,000 of the approximately £430,000 Annual Average Damages for the entire Shetland Local Plan District.

The main source of flooding is from coastal flooding which contributes around 80% of the estimated Annual Average Damages (Figure 2.2). The Annual Average Damages caused by coastal floods are approximately £350,000 with those caused by river and surface water floods being approximately £55,000 and £30,000 respectively.

Table 2.2 summarises the headline actions to manage flood risk over the six year plan period. A full list of actions to manage flood risk over the six year plan period including details of the standard of protection, costs and benefits, and coordination and funding arrangements are included in Annex 1 of the Plan. These details are also provided for the LPD and each PVA in sections 2.3 and 2.4 to 2.6 respectively.

Table 2.2: Summary of actions in the LFRMP

LPD-wide / PVA	Selected Action	Location	Objective	Proposed delivery period
PVA 04/01	Vidlin Flood Protection Study (4001010005)	Vidlin coastal area	Reduce risk of coastal flooding in Vidlin (400101)	Survey and analysis in 2017-2018, with any resulting further work then subject to prioritisation and funding
PVA 04/02	Walls Flood Protection Study (4002010005)	Walls coastal area	Reduce risk of coastal flooding in Shetland Mainland West (400201)	Survey and analysis in 2018-2019, with any resulting further work then subject to prioritisation and funding
PVA 04/03	Cunningsburgh Flood Protection Study (4003010005)	Cunningsburgh - Burn of Mail and Burn of Voxter	Reduce risk in the Cunningsburgh area from river and surface water flooding (400301)	Survey and analysis in 2019-2020, with any resulting further work then subject to prioritisation and funding
PVA 04/03	Surface Water Plan/Study covering Lerwick and Scalloway (4003050018)	Lerwick South Burn of Gremista. Scalloway Burn Beach	Reduce risk from surface water flooding in Lerwick and Scalloway (400305)	Survey and outline design work in 2017-2020 for specific works in the priority areas with any resulting construction works then subject to prioritisation and possible third party agreement / contribution
PVA 04/03	Strategic mapping and modelling (4000020019)	Lerwick DOA/Maa Ness DOA	Reduce overall flood risk (400002)	2016-2019
LPD Wide	Flood Forecasting (4000020009)	LPD Wide	Reduce overall flood risk. (400002)	On-going
LPD Wide	Self Help (4000020011)	LPD Wide	Reduce overall flood risk. (400002)	On-going
LPD Wide	Awareness Raising (4000020013)	PVA 04/01	Reduce overall flood risk. (400002)	On-going
LPD Wide	Maintenance (4000020007)	LPD Wide	Reduce overall flood risk. (400002)	On-going
LPD Wide	Emergency Response (4000020014)	LPD Wide	Reduce overall flood risk. (400002)	On-going
LPD Wide	Planning policy (4000010001)	LPD Wide	Avoid an overall increase in flood risk. (400001) Reduce overall flood risk (400002)	On-going

2.3 Local Plan District Overview

This Local Plan District comprises all the islands which are part of the Shetland Islands. It has an area of approximately 1,500 km² and a coastline with a length of approximately 2,700km.

There are three Potentially Vulnerable Areas in the Shetland Local Plan District.

Flood Risks in Shetland

There are approximately 30 residential properties and 50 non-residential properties at risk of flooding within the Local Plan District.

Figure 2.2 and Table 2.3 show the number of properties at risk and the Annual Average Damages caused by flooding in the main areas within the Local Plan District. This includes damages to residential properties, non-residential properties, transport and agriculture. Please note that economic damages to airports are not included as information on damages at this scale is not available.

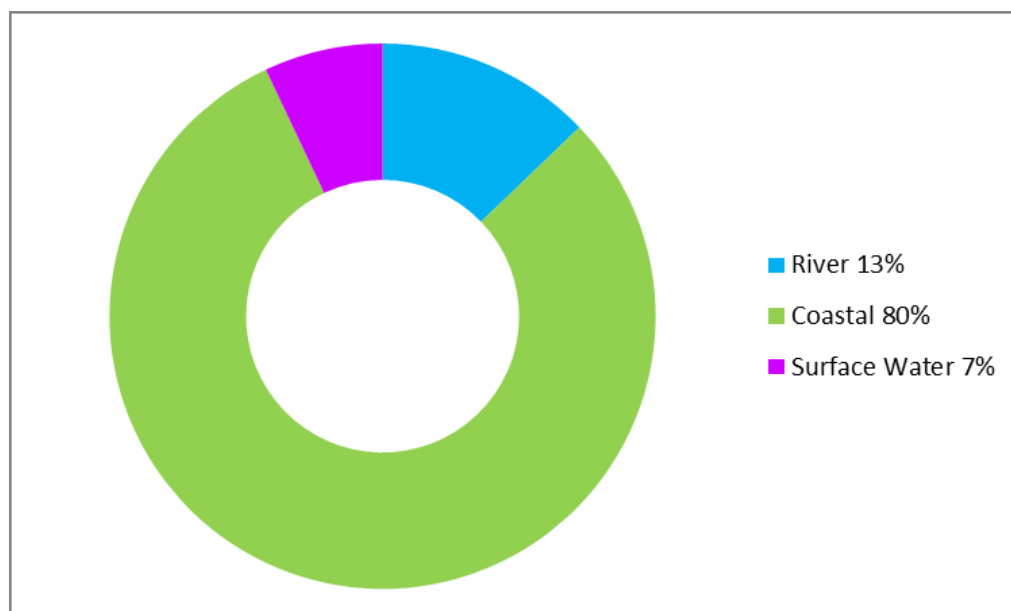


Figure 2.2: Annual Average Damages by flood source

Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

Table 2.3: Potentially Vulnerable Areas at risk of flooding

	Residential and Non-residential Properties at risk of flooding	Average Annual Damages
Shetland Mainland North	<10	£47,000
Shetland Mainland West	20	£88,000
Shetland Mainland South	20	£43,000

Objectives and actions in the Shetland Local Plan District

The objectives are the shared aims for managing flooding. Actions describe where and how flood risk will be managed. Objectives and actions have been set by SEPA and agreed by flood risk management Responsible Authorities following consultation.

These objectives and actions apply to all areas of the Local Plan District, including the Potentially Vulnerable Areas. There are more specific actions that apply within Potentially Vulnerable Areas, in addition to those listed in the boxes below. Further detail can be found in the relevant Potentially Vulnerable Area chapter.

Table 2.4: Objectives for the whole Shetland LPD

Target area	Objective(s)	ID	Indicators (numbers affected)
Applies across the Shetland Local Plan District	Avoid an overall increase in flood risk	400001	<ul style="list-style-type: none"> • 30 residential properties • 50 non-residential properties • 70 people
Applies across the Shetland Local Plan District	Reduce overall flood risk	400002	<ul style="list-style-type: none"> • 30 residential properties • 50 non-residential properties • 70 people

Action (ID):	FLOOD FORECASTING (4000020009)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	SEPA		
Status:	Existing	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.</p> <p>The flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding.</p> <p>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 Areas are within the 'Shetland' flood alert area.</p>		
Coordination:	<p>SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.</p> <p>Warnings received are circulated to the Council's Severe Weather email list as it the possibility of flooding is usually linked to high winds in a particular direction together with high tides / storm surge.</p>		
Funding:	<p>SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.</p> <p>Council involvement is funded from existing SIC revenue budgets</p>		

Action (ID):	SELF HELP (4000020011)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:			
Status:	Existing	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.		
Coordination:	Where premises are subject to historical flooding the owners are aware of their responsibilities and that flood damage can be reduced by suitable provision and maintenance of drainage and flood protection infrastructure, including property level protection.		
Funding:	<p>General information is made available as part of existing Shetland Islands Council awareness raising activities.</p> <p>There are no existing specific Council budgets for funding self help works.</p> <p>Funding of physical works will fall to owners/occupiers.</p>		

Action (ID):	AWARENESS RAISING (4000020013)		
Objective (ID):	Reduce overall flood risk. (400002)		
Delivery lead:	Responsible Authorities		
Status:	Ongoing	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>Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Shetland Islands Council will seek to improve communication with the public over flood risk, including how risks can be avoided or mitigated, how warnings of potential flooding events are given and how the council can raise public understanding of actions they can take to protect themselves.</p> <p>A Scottish Government initiative on awareness raising in Schools is planned, with input from SIC services.</p> <p>Scottish Water will support SEPA and Responsible Authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>More general information and flooding guidance will be available on the website at: https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information</p>		
Coordination	<p>The Shetland Islands Council, SEPA and Scottish Water will co-ordinate awareness raising activities with other Responsible Authorities, through the regular Local Plan District Partnerships and Flood Risk Management Local Area Group meetings.</p> <p>More information on the roles of these groups is given in Annex 3</p>		
Funding:	<p>Council involvement is funded from existing SIC revenue budgets</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Action (ID):	MAINTENANCE (4000020007)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Shetland Islands Council, asset / land managers		
Status:	Existing	Delivery:	On-going
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. The Shetland Islands Council Roads Service carry out inspections of Roads bridges and culverts and associated sections of watercourses and produce a schedule of clearance and repair works for priority locations, which is made available for public inspection.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p> <p>Other 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>		
Coordination:	<p>Shetland Islands Council will publish a schedule of planned watercourse inspection, clearance and repair works.</p> <p>Awareness of third party works impacts on watercourses or flood protection infrastructure will be raised with authorities through the required planning permission and/or other required licensing processes and discussions at LPDP and FRM LAG group meetings.</p> <p>Scottish Water will keep Responsible Authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.</p>		
Funding:	Roads Service inspections are funded from existing SIC revenue budgets.		

Action (ID):	EMERGENCY PLANS/RESPONSE (4000020014)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Delivery:	On-going
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA.</p> <p>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 the Shetland Emergency Planning Forum (SEPF) and regional and local resilience partnerships. This response may be supported by the work of Scottish Water and voluntary organisations.</p>		
Coordination:	The Shetland Islands Council have a Major Emergency Plan which is a generic contingency plan to enable the Council's response to a major emergency, including flooding.		
Funding:	Emergency Planning and other Council service actions are funded from existing SIC revenue budgets.		

Action (ID):	PLANNING POLICIES (4000010001)		
Objective (ID):	Avoid an overall increase in flood risk. (400001) Reduce overall flood risk. (400002)		
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.</p> <p>For further information on the application of national planning policies see Annex 5 of the LFRMP.</p> <p>Areas in Shetland identified for development in the Local Development Plan have had initial flood risk assessments carried out as part of their consideration.</p> <p>Applications for developments have requirements to address flooding and drainage in a suitable way, and a local Supplementary Guidance document gives advice. Applications which fall under the 5m contour (for coastal flood risk) or within the 1 in 200 year flood risk areas on SEPA's flood maps (for surface water and river flood risks) are required to provide more detail to confirm the flood risks have been considered and dealt with.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act.</p> <p>Further information about how SEPA engage in the planning system,</p>		

	<p>including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by Shetland Islands Council.</p>
<p>Coordination:</p>	<p>Production of the Shetland Local Development Plan and specifically the "Call for Sites" process included a multi-stage consultation with public and other stakeholders.</p> <p>There are consultations with Council and Non-Council stakeholders as part of consideration of planning applications.</p> <p>SEPA's land use planning activities will be co-ordinated with the activities of other Responsible Authorities as required.</p>
<p>Funding:</p>	<p>Development Planning and other Council service input funded from existing revenue budgets</p> <p>SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>

2.4 Potentially Vulnerable Areas

The table below summarises the actions to manage flood risk in the Potentially Vulnerable Areas of this Local Plan District. Further detail is provided in sections 2.6 to 2.8 for each Potentially Vulnerable Area.

Table 2.5: Proposed flood actions for each PVA

PVA	Flood protection scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
04/01				✓				N/A	N/A	✓			✓	✓	✓		✓	✓
04/02				✓				N/A	N/A	✓			✓	✓	✓		✓	✓
04/03				✓		✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓

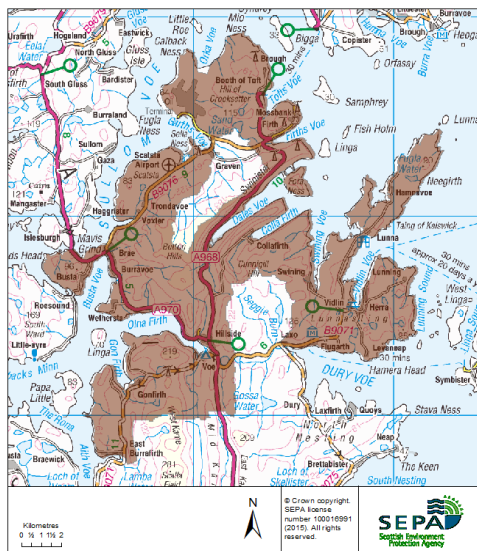
* Note: N/A is used where there is no formal Flood Protection Scheme or flood warning scheme present

2.5 Flood risk, objectives, actions and prioritisation for Shetland North Mainland (PVA 04/01)

Background

This Potentially Vulnerable Area is located in the north of Mainland Shetland (shown below). It is approximately 150km².

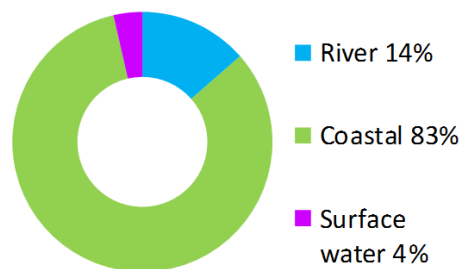
The area is predominately rural with many small burns and lochs. The coastline is characterised by bays, inlets and voes.



There are several communities including Voe, Mossbank, Brae and Vidlin located in this Potentially Vulnerable Area. The A968 and A970, Scatsta Airport and the Sullom Voe Oil Terminal are also located in this area.

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

The Annual Average Damages are £47,000 with the majority caused by coastal flooding.



Annual Average Damages by flood source

Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

Summary of flooding impacts

Coastal flood risk in the area is focused at the head of the voe in Vidlin. Flooding from wave action is not fully represented in the assessment of flood risk and both the number of properties at risk and the stated damages from coastal flooding may be underestimated as a result.

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 2.6.

Significant lengths of road are at risk of flooding, including the access road to Sullom Voe Oil Terminal. This may lead to disruption in linking the terminal, towns and

villages to services and may reduce access to the airport and ports. Lunnasting Primary School in Vidlin is also identified as at risk of flooding.

There are 10 designated cultural heritage sites and small areas of designated environmental sites at risk within this area. These include Special Areas of Conservation at “Yell Sound Coast”, “The Vadills” and “Mousa”, and Sites of Special Scientific Interest at “Sullom Voe”, “Dales Voe”, “Laxo Burn”, “Voxter Voe” and “Valayre Quarry”.

The damages associated with floods of different likelihood are shown in Figure 2.3. For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to roads. The locations of the impacts of flooding are shown in Figure 2.4.

Table 2.6: Summary of flooding impacts

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
Residential properties (total of 1,200)	<10	<10	<10
Non-residential properties (total of 220)	<10	<10	<10
People	<10	<10	<10
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 30 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km²)	0.6	0.7	0.7
Designated cultural heritage sites	1	10	10
Agricultural land (km²)	0.6	0.7	0.8

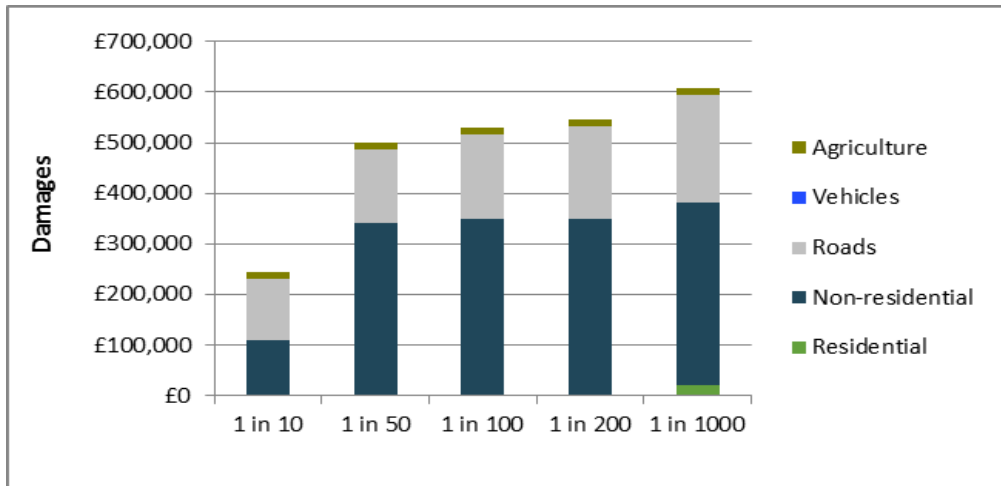


Figure 2.3: Damages by flood likelihood
 Reproduced from *Shetland Flood Risk Management Strategy, SEPA (December 2015)*

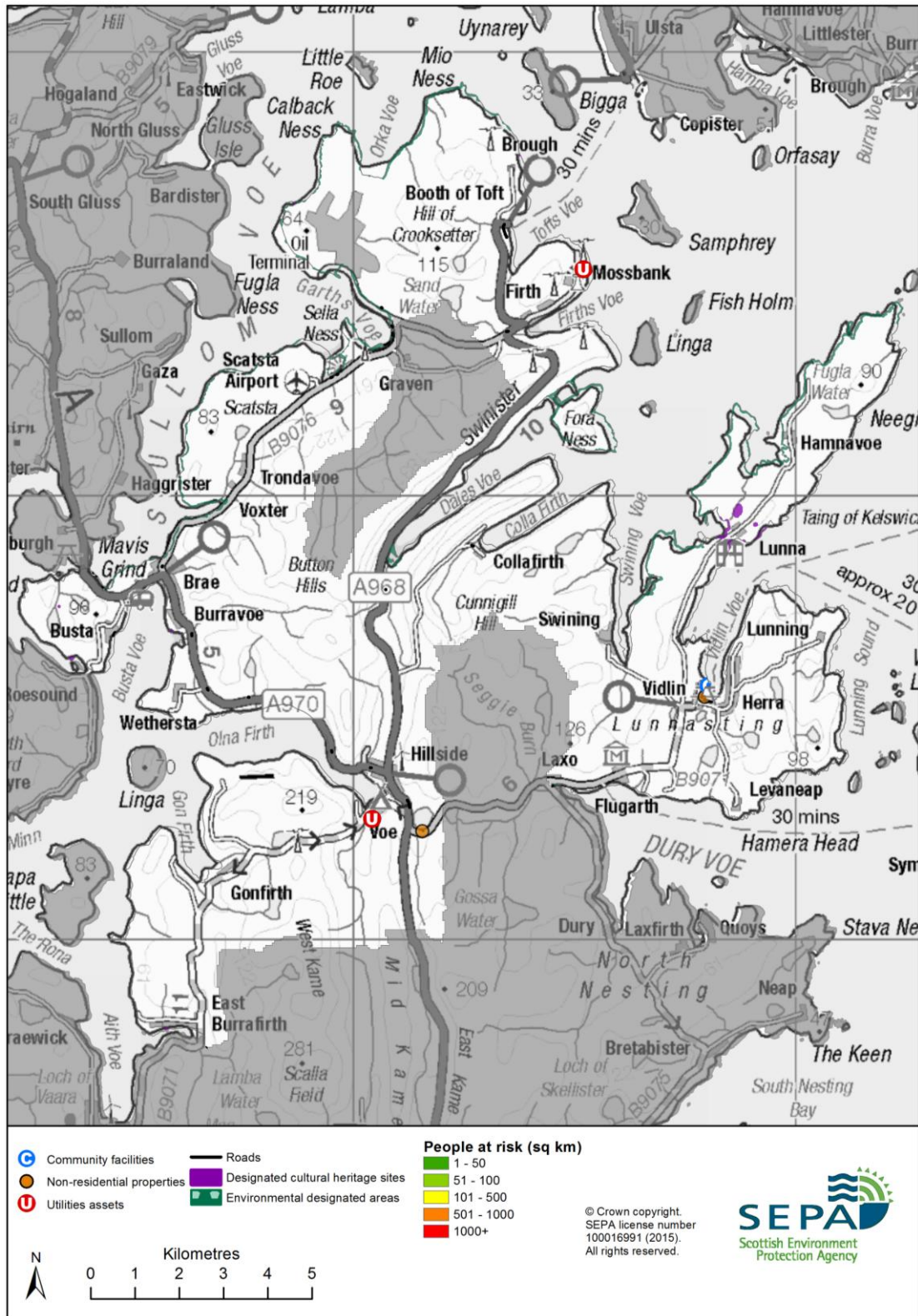


Figure 2.4: Impacts of flooding

Reproduced from *Shetland Flood Risk Management Strategy*, SEPA (December 2015)

History of flooding

The earliest recorded flood was in 1882 caused by a severe thunderstorm, which affected roads and crops at a regional level. There have been six floods since 2003 coming from different sources which have caused localised flooding. There was one coastal flood in 2003, which affected the boat club car park. In 2003, 2005 and 2008 floods affected roads and car parks due to runoff from hills, blocked ditches and gullies. Property was flooded in 2006 caused by hill runoff, this reoccurred in 2007 resulting in flooding in the vicinity of a housing estate.

Objectives to manage flooding in Potentially Vulnerable Area 04/01

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with Shetland Islands Council and Scottish Water following consultation. They were identified through an assessment of historical events, flood modelling and local knowledge regarding the causes and impacts of flooding in the area.

The objectives below have been set for the Shetland North Mainland Potentially Vulnerable Area, where there is potential coastal flood risk to the area of Vidlin near the school, marina and ferry terminal. The target area defines the objective focus, where actions may be located, rather than implying a specific area at flood risk.

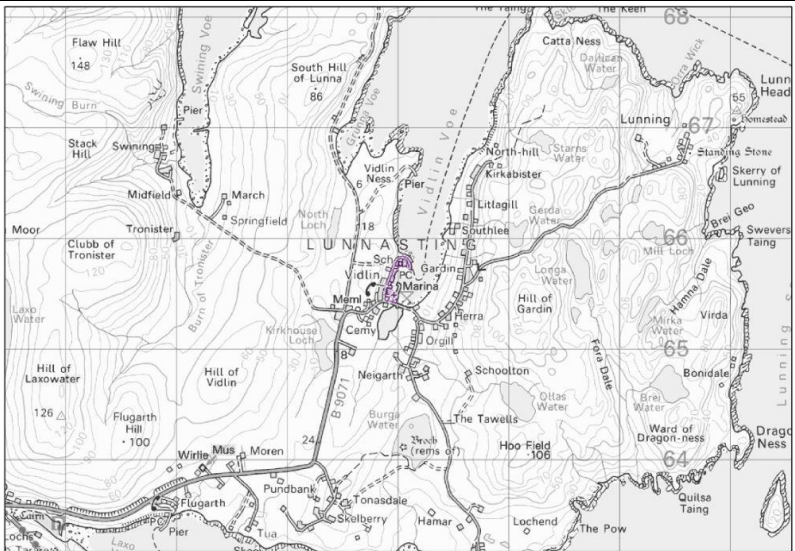
Reduce risk of coastal flooding in Vidlin	
<p>Indicators:</p> <ul style="list-style-type: none"> • £11,000 Annual Average Damages from non-residential properties • 1 community facility 	 <p>© Crown Copyright and database right 2016. All rights reserved. Ordnance Survey licence number 100024344.</p>
<p>Objective ID: 400101</p>	

Table 2.7: Summary of flooding impacts in PVA 04/01

Target area	Objective(s)	ID	Indicators within PVA
Applies across Shetland Local Plan District	Avoid an overall increase in flood risk	400001	<ul style="list-style-type: none"> • <10 residential Properties • £47,000 Annual Average Damages
Applies across Shetland Local Plan District	Reduce overall flood risk	400002	<ul style="list-style-type: none"> • <10 residential Properties • £47,000 Annual Average Damages

Actions to manage flooding in PVA 04/01

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with Shetland Islands Council and Scottish Water following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria regarding the causes and impacts of flooding in the area. The actions shaded in Table 2.8 and then described below have been selected as the most appropriate for Shetland Mainland North Potentially Vulnerable Area.

Table 2.8: Summary of selected actions in PVA 04/01

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 (4001010005)		
Objective (ID):	Reduce risk of coastal flooding in Vidlin (400101)		
Delivery lead:	Shetland Islands Council		
Rank:	National:	By local authority area:	
	154 of 168	2 of 3	
Status:	Not started	Delivery:	2017 – 2018
Description:	<p>Flood modelling in the Vidlin area suggests that properties and infrastructure may be at risk of coastal flooding, but there is uncertainty about the accuracy of the base level information used in that assessment.</p> <p>As a first step the SIC will carry out surveying of areas where property may be at risk, to better understand the actual level of risk. If an improved understanding does confirm a significant flood risk to property or infrastructure, the study should progress to identify the most sustainable range of actions to address this.</p> <p>Wave action would be considered as part of the study</p>		
Potential impacts			
Economic:	The study should develop the economic case for flood protection works, including risk from wave overtopping. Damages avoided of £350,000 could be achieved. This value could increase once wave overtopping is considered.		
Social:	The school and church in Vidlin are at risk of flooding. In addition the road leading to the ferry terminal (which provides a key link to Mainland from Whalsay and Out Skerries) is at risk of flooding. The number of people, community facilities, and roads which may benefit from future flood protection works should be confirmed through the study. 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 is a scheduled monument cultural heritage site which may benefit from future flood protection works.		
Coordination arrangement:	The survey and study will be carried out after discussion with SEPA hydrologists to ensure the information is as useful and relevant as possible.		

	Results may help to inform future revisions of SEPA's flood maps
Funding arrangement:	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.

Action (ID):	FLOOD FORECASTING (4000020009)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	SEPA		
Status:	Existing	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.</p> <p>The flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding.</p> <p>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 Areas are within the 'Shetland' flood alert area.</p>		
Coordination:	<p>SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.</p> <p>Warnings received are circulated to the Council's Severe Weather email list as it the possibility of flooding is usually linked to high winds in a particular direction together with high tides / storm surge.</p>		
Funding:	<p>SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.</p> <p>Council involvement is funded from existing SIC revenue budgets</p>		

Action (ID):	SELF HELP (4000020011)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:			
Status:	Existing	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.		
Coordination:	Where premises are subject to historical flooding the owners are aware of their responsibilities and that flood damage can be reduced by suitable provision and maintenance of drainage and flood protection infrastructure, including property level protection.		
Funding:	<p>General information is made available as part of existing Shetland Islands Council awareness raising activities.</p> <p>There are no existing specific Council budgets for funding self help works.</p>		

Action (ID):	AWARENESS RAISING (4000020013)		
Objective (ID):	Reduce overall flood risk. (400002)		
Delivery lead:	Responsible Authorities		
Status:	Ongoing	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>Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Shetland Islands Council will seek to improve communication with the public over flood risk, including how risks can be avoided or mitigated, how warnings of potential flooding events are given and how the council can raise public understanding of actions they can take to protect themselves.</p> <p>A Scottish Government initiative on awareness raising in Schools is planned, with input from SIC services.</p> <p>Scottish Water will support SEPA and Responsible Authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>More general information and flooding guidance will be available on the website at: https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information</p>		
Coordination	<p>The Shetland Islands Council, SEPA and Scottish Water will co-ordinate awareness raising activities with other Responsible Authorities, through the regular Local Plan District Partnerships and Flood Risk Management Local Area Group meetings.</p> <p>More information on the roles of these groups is given in Annex 3</p>		
Funding:	<p>Council involvement is funded from existing SIC revenue budgets</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Action (ID):	MAINTENANCE (4000020007)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Shetland Islands Council, asset / land managers		
Status:	Existing	Delivery:	On-going
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. The Shetland Islands Council Roads Service carry out inspections of Roads bridges and culverts and associated sections of watercourses and produce a schedule of clearance and repair works for priority locations, which is made available for public inspection.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p> <p>Other 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>		
Coordination:	<p>Shetland Islands Council will publish a schedule of planned watercourse inspection, clearance and repair works.</p> <p>Awareness of third party works impacts on watercourses or flood protection infrastructure will be raised with authorities through the required planning permission and/or other required licensing processes and discussions at LPDP and FRM LAG group meetings.</p> <p>Scottish Water will keep Responsible Authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.</p>		
Funding:	Roads Service inspections are funded from existing SIC revenue budgets.		

Action (ID):	EMERGENCY PLANS/RESPONSE (4000020014)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Delivery:	On-going
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA.</p> <p>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 the Shetland Emergency Planning Forum (SEPF) and regional and local resilience partnerships. This response may be supported by the work of Scottish Water and voluntary organisations.</p>		
Coordination:	The Shetland Islands Council have a Major Emergency Plan which is a generic contingency plan to enable the Council's response to a major emergency, including flooding.		
Funding:	Emergency Planning and other Council service actions are funded from existing SIC revenue budgets.		

Action (ID):	PLANNING POLICIES (4000010001)		
Objective (ID):	Avoid an overall increase in flood risk. (400001) Reduce overall flood risk. (400002)		
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.</p> <p>For further information on the application of national planning policies see Annex 5 of the LFRMP.</p> <p>Areas in Shetland identified for development in the Local Development Plan have had initial flood risk assessments carried out as part of their consideration.</p> <p>Applications for developments have requirements to address flooding and drainage in a suitable way and a local Supplementary Guidance document gives advice. Applications which fall under the 5m contour (for coastal flood risk) or within the 1 in 200 year flood risk areas on SEPA's flood maps (for surface water and river flood risks) are required to provide more detail to confirm the flood risks have been considered and dealt with.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act.</p> <p>Further information about how SEPA engage in the planning system,</p>		

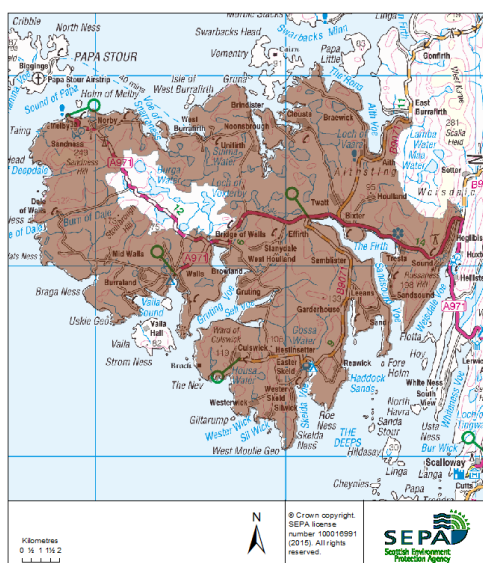
	<p>including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by Shetland Islands Council.</p>
<p>Coordination:</p>	<p>Production of the Shetland Local Development Plan and specifically the "Call for Sites" process included a multi-stage consultation with public and other stakeholders.</p> <p>There are consultations with Council and Non-Council stakeholders as part of consideration of planning applications.</p> <p>SEPA's land use planning activities will be co-ordinated with the activities of other Responsible Authorities as required.</p>
<p>Funding:</p>	<p>Development Planning and other Council service input funded from existing revenue budgets</p> <p>SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>

2.6 Flood risk, objectives, actions and prioritisation for Shetland West Mainland (PVA 04/02)

Background

This Potentially Vulnerable Area is located in the west of Mainland Shetland (shown below). It is approximately 220km².

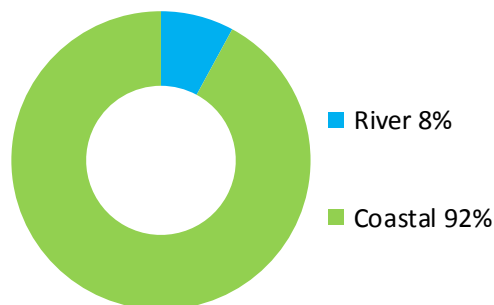
The area is predominantly rural with many small burns and lochs. The coastline is characterised by bays, inlets and voes.



There are several communities including Sandness, Walls, Easter Skeld, and Aith. The A971 road runs through the Potentially Vulnerable Area providing the main access route.

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

The Annual Average Damages are £88,000, with the majority caused by coastal flooding.



Annual Average Damages by flood source

Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

Summary of flooding impacts

Coastal flood risk in the area is limited to individual properties or small clusters of properties on the coastline and at the head of voes. Flooding from wave action is not fully represented in the assessment of flood risk and both the number of properties at risk and the damages from coastal flooding may be underestimated as a result.

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 2.9.

Significant lengths of road are at risk, leading to disruption to transport routes linking smaller towns and villages to services. There are 16 designated cultural heritage sites, small areas of environmental importance and agricultural land at risk of flooding.

The damages associated with floods of different likelihood are shown in Figure 2.5.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads.

The location of the impacts of flooding is shown in Figure 2.6.

Table 2.9: Summary of flooding impacts

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
Residential properties (total of 630)	10	10	10
Non-residential properties (total of 290)	<10	<10	<10
People	30	30	30
Community facilities	0	0	0
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 40 locations	Roads at 50 locations	Roads at 50 locations
Environmental designated areas (km ²)	0.6	0.7	0.7
Designated cultural heritage sites	15	16	18
Agricultural land (km ²)	2	3	3

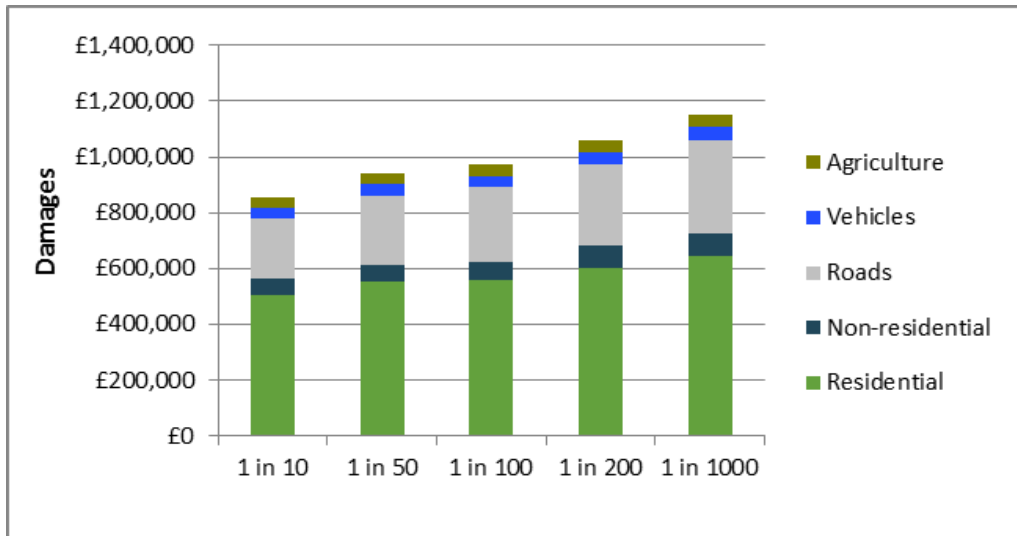


Figure 2.5: Damages by flood likelihood
Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

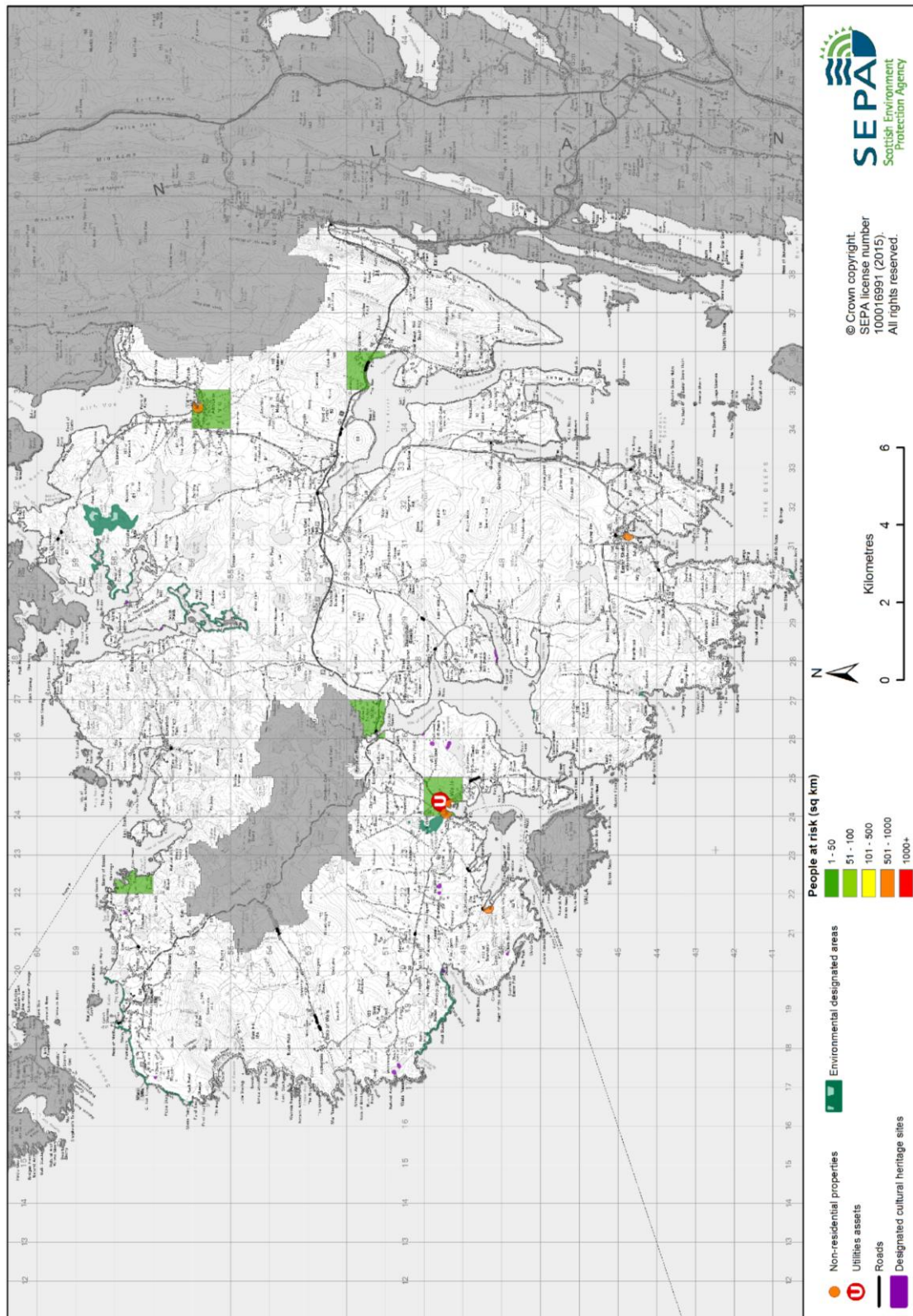


Figure 2.6: Impacts of flooding

Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

History of flooding

There have been a number of floods in this Potentially Vulnerable Area in recent years. In 2006, hill runoff caused flooding to a garden and rear of a property. Other floods were caused by blockages of drainage infrastructure including ditches and gullies.

Objectives to manage flooding in Potentially Vulnerable Area 04/02

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with Shetland Islands Council and Scottish Water following consultation. They were identified through an assessment of historical events, flood modelling and local knowledge regarding the causes and impacts of flooding in the area.

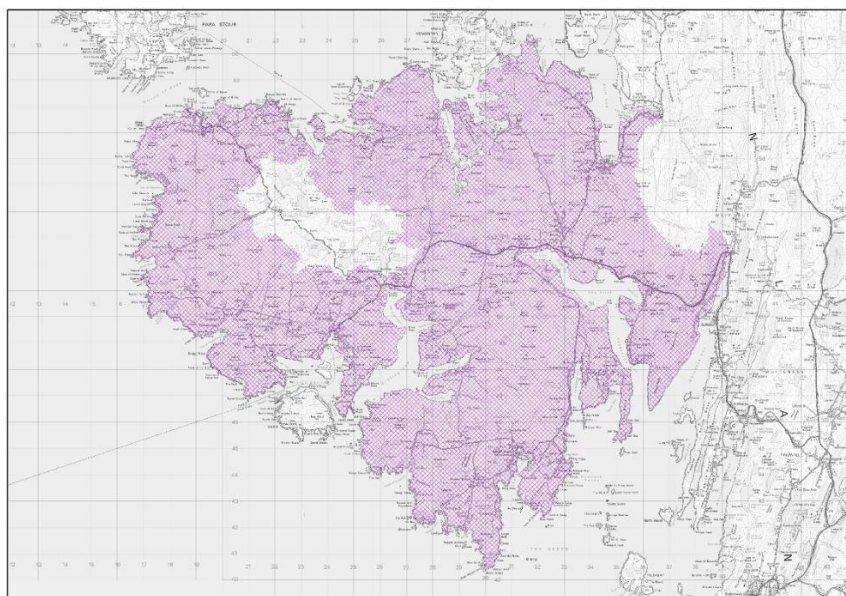
The objectives below have been set for the Shetland West Mainland Potentially Vulnerable Area, where there is potential coastal flood risk to the coastal areas of Walls near the shop. The target area defines the objective focus, where actions may be located, rather than implying a specific area at flood risk.

Reduce risk of coastal flooding in Shetland West Mainland

Indicators:

- £51,000 Annual Average Damages from residential properties
- £6,300 Annual Average Damages from non-residential properties

Objective ID:
400201



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Table 2.10: Summary of flooding impacts in PVA 04/02

Target area	Objective(s)	ID	Indicators within PVA
Applies across Shetland Local Plan District	Avoid an overall increase in flood risk	400001	<ul style="list-style-type: none"> • 10 residential properties • £88,000 Annual Average Damages
Applies across Shetland Local Plan District	Reduce overall flood risk	400002	<ul style="list-style-type: none"> • 10 residential properties • £88,000 Annual Average Damages

Actions to manage flooding in PVA 04/02

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed SEPA and agreed with Shetland Islands Council and Scottish Water following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria regarding the causes and impacts of flooding in the area. The actions shaded in Table 2.11 and then described below have been selected as the most appropriate for Shetland West Mainland Potentially Vulnerable Area.

Table 2.11: Summary of selected actions in PVA 04/02

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 (4002010005)		
Objective (ID):	Reduce risk of coastal flooding in Shetland Mainland West (400201)		
Delivery lead:	Shetland Islands Council		
Rank:	National:	By local authority area:	
	138 of 168	1 of 3	
Status:	Not started	Delivery:	2018 – 2019
Description:	<p>Flood modelling in the Walls area suggests that properties and infrastructure may be at risk of coastal flooding, but there is uncertainty about the accuracy of the base level information used in that assessment.</p> <p>As a first step the SIC will carry out surveying of areas where property may be at risk, to better understand the actual level of risk. If an improved understanding does confirm a significant flood risk to property or infrastructure, the study should progress to identify the most sustainable range of actions to address this.</p> <p>Wave action would be considered as part of the study.</p>		
Potential impacts			
Economic:	The study could benefit 11 residential and seven non-residential properties at risk of flooding in this location, with estimated damages avoided of £1.9 million. The study should consider the impact of wave overtopping, which may increase the benefits.		
Social:	There are currently an estimated 24 people at risk from coastal floods. In addition there are sections of road, including the A971, which are at risk of flooding. The number of people, community facilities, and roads which may benefit from future flood protection works should be confirmed through the study. 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 is potential to impact on the Lochs of Kirkigarth and Bardister Site of Special Scientific Interest at Walls. There is also potential to impact on a scheduled monument cultural heritage site at Walls.		
Coordination:	The survey and study will be carried out after discussion with SEPA hydrologists to ensure the information is as useful and relevant as		

	possible. Results may help to inform future revisions of SEPA's flood maps
Funding arrangement:	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.

Action (ID):	FLOOD FORECASTING (4000020009)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	SEPA		
Status:	Existing	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.</p> <p>The flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding.</p> <p>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 Areas are within the 'Shetland' flood alert area.</p>		
Coordination:	<p>SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.</p> <p>Warnings received are circulated to the Council's Severe Weather email list as it the possibility of flooding is usually linked to high winds in a particular direction together with high tides / storm surge.</p>		
Funding:	<p>SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.</p> <p>Council involvement is funded from existing SIC revenue budgets</p>		

Action (ID):	SELF HELP (4000020011)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:			
Status:	Existing	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.		
Coordination:	Where premises are subject to historical flooding the owners are aware of their responsibilities and that flood damage can be reduced by suitable provision and maintenance of drainage and flood protection infrastructure, including property level protection.		
Funding:	<p>General information is made available as part of existing Shetland Islands Council awareness raising activities.</p> <p>There are no existing specific Council budgets for funding self help works.</p>		

Action (ID):	AWARENESS RAISING (4000020013)		
Objective (ID):	Reduce overall flood risk. (400002)		
Delivery lead:	Responsible Authorities		
Status:	Ongoing	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>Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Shetland Islands Council will seek to improve communication with the public over flood risk, including how risks can be avoided or mitigated, how warnings of potential flooding events are given and how the council can raise public understanding of actions they can take to protect themselves.</p> <p>A Scottish Government initiative on awareness raising in Schools is planned, with input from SIC services.</p> <p>Scottish Water will support SEPA and Responsible Authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>More general information and flooding guidance will be available on the website at: https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information</p>		
Coordination	<p>The Shetland Islands Council, SEPA and Scottish Water will co-ordinate awareness raising activities with other Responsible Authorities, through the regular Local Plan District Partnerships and Flood Risk Management Local Area Group meetings.</p> <p>More information on the roles of these groups is given in Annex 3</p>		
Funding:	<p>Council involvement is funded from existing SIC revenue budgets</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Action (ID):	MAINTENANCE (4000020007)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Shetland Islands Council, asset / land managers		
Status:	Existing	Delivery:	On-going
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. The Shetland Islands Council Roads Service carry out inspections of Roads bridges and culverts and associated sections of watercourses and produce a schedule of clearance and repair works for priority locations, which is made available for public inspection.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p> <p>Other 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>		
Coordination:	<p>Shetland Islands Council will publish a schedule of planned watercourse inspection, clearance and repair works.</p> <p>Awareness of third party works impacts on watercourses or flood protection infrastructure will be raised with authorities through the required planning permission and/or other required licensing processes and discussions at LPDP and FRM LAG group meetings.</p> <p>Scottish Water will keep Responsible Authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.</p>		
Funding:	Roads Service inspections are funded from existing SIC revenue budgets.		

Action (ID):	EMERGENCY PLANS/RESPONSE (4000020014)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Delivery:	On-going
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA.</p> <p>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 the Shetland Emergency Planning Forum (SEPF) and regional and local resilience partnerships. This response may be supported by the work of Scottish Water and voluntary organisations.</p>		
Coordination:	The Shetland Islands Council have a Major Emergency Plan which is a generic contingency plan to enable the Council's response to a major emergency, including flooding.		
Funding:	Emergency Planning and other Council service actions are funded from existing SIC revenue budgets.		

Action (ID):	PLANNING POLICIES (4000010001)		
Objective (ID):	Avoid an overall increase in flood risk. (400001) Reduce overall flood risk. (400002)		
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.</p> <p>For further information on the application of national planning policies see Annex 5 of the LFRMP.</p> <p>Areas in Shetland identified for development in the Local Development Plan have had initial flood risk assessments carried out as part of their consideration.</p> <p>Applications for developments have requirements to address flooding and drainage in a suitable way and a local Supplementary Guidance document gives advice. Applications which fall under the 5m contour (for coastal flood risk) or within the 1 in 200 year flood risk areas on SEPA's flood maps (for surface water and river flood risks) are required to provide more detail to confirm the flood risks have been considered and dealt with.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act.</p> <p>Further information about how SEPA engage in the planning system,</p>		

	<p>including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by Shetland Islands Council.</p>
<p>Coordination:</p>	<p>Production of the Shetland Local Development Plan and specifically the "Call for Sites" process included a multi-stage consultation with public and other stakeholders.</p> <p>There are consultations with Council and Non-Council stakeholders as part of consideration of planning applications.</p> <p>SEPA's land use planning activities will be co-ordinated with the activities of other Responsible Authorities as required.</p>
<p>Funding:</p>	<p>Development Planning and other Council service input funded from existing revenue budgets</p> <p>SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>

2.7 Flood risk, objectives, actions and prioritisation for Shetland Central and South Mainland (PVA 04/03)

Background

This Potentially Vulnerable Area is located in central and south Mainland Shetland. It is approximately 150km² (shown below).

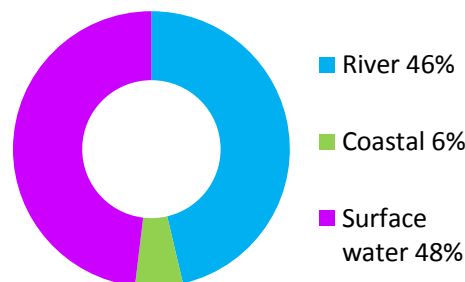
The area is predominantly rural with many small burns and lochs. The coastline is characterised by bays, inlets and voes.



There are several towns and villages in this Potentially Vulnerable Area, including Lerwick and settlements at Sumburgh, Scalloway and Sandwick. Sumburgh Airport and the main A970 road that links Lerwick to the airport are also within the area.

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

The Annual Average Damages are £43,000 with the majority caused by river and surface water flooding.



Annual Average Damages by flood source

Reproduced from Shetland Flood Risk Management Strategy, SEPA (December 2015)

Summary of flooding impacts

River flood risk occurs on the Burn of Mail and Burn of Laxdale in Cunningsburgh. There are localised areas of surface water flood risk associated with smaller burns and lochs.

Coastal flood risk is predominantly limited to a narrow coastal strip in areas such as Hays Dock, Lerwick. Flooding from wave action is not fully represented in the assessment of flood risk and the number of properties at risk and the damages from coastal flooding may be underestimated as a result.

There are known surface water flood risks from historical incidents, particularly

notably on the South Burn of Gremista in Lerwick and at the Burn Beach outfall in Scalloway. A Surface Water Management Plan will be carried out covering those areas of Lerwick and Scalloway which will gather more survey and other information and use those to better inform an assessment of the risks resulting from interactions of surface water, the drainage systems and sea tide and wave effects on the catchments. Scottish Water will also provide local knowledge and understanding of the sewer network, including outputs of Section 16 studies.

There are existing land use planning restrictions on upstream development in both catchments and the studies will generate improved public engagement and understanding of those issues and the resulting implications for future developments.

If appropriate, these studies may also progress further and identify and carry out outline design work on the most sustainable range of actions to address or mitigate the flood risks at specific 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 2.12.

Roads, including the A970, are at risk from flooding leading to disruption in access between towns and to Sumburgh Airport and Lerwick Port. Surface water flooding affects a small area of the airport runway potentially causing disruption to flights. There are 18 designated cultural heritage sites and small areas of environmental importance at risk. These include the Lochs of Spiggie and Brow Special Protection Area, Aith Meadows and the Burn of Aith Site of Special Scientific Interest.

The damages associated with floods of different likelihood are shown in Figure 2.7. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads.

The location of the impacts of flooding is shown in Figure 2.8.

Table 2.12: Summary of flooding impacts

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
Residential properties (total of 5,400)	<10	<10	<10
Non-residential Properties (total of 1,200)	<10	10	10

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
People	<10	10	20
Community facilities	0	0	0
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 60 locations Sumburgh Airport	Roads at 70 locations Sumburgh Airport	Roads at 70 locations Sumburgh Airport
Environmental designated areas (km ²)	0.4	0.5	0.5
Designated cultural heritage sites	12	18	19
Agricultural land (km ²)	0.9	1	1

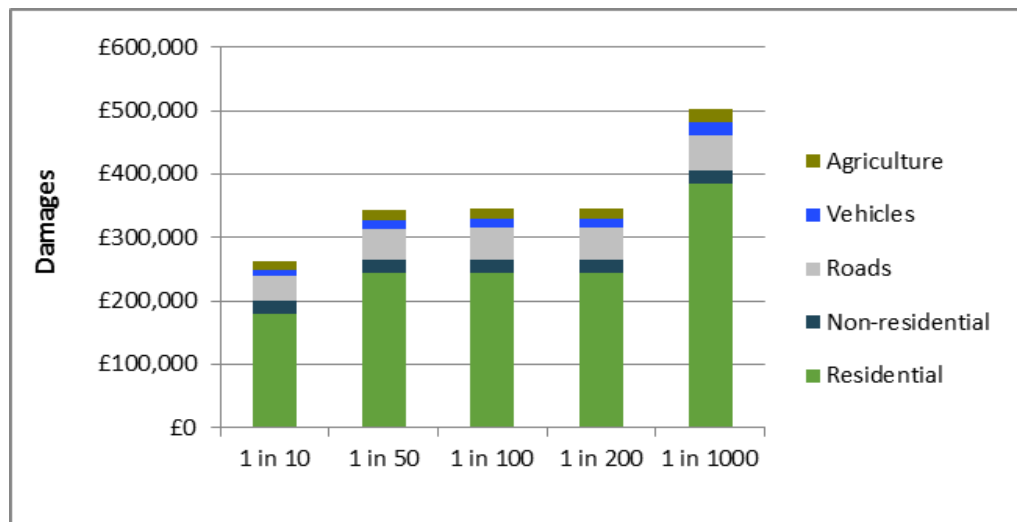


Figure 2.7: Damages by flood likelihood
 Reproduced from *Shetland Flood Risk Management Strategy, SEPA (December 2015)*

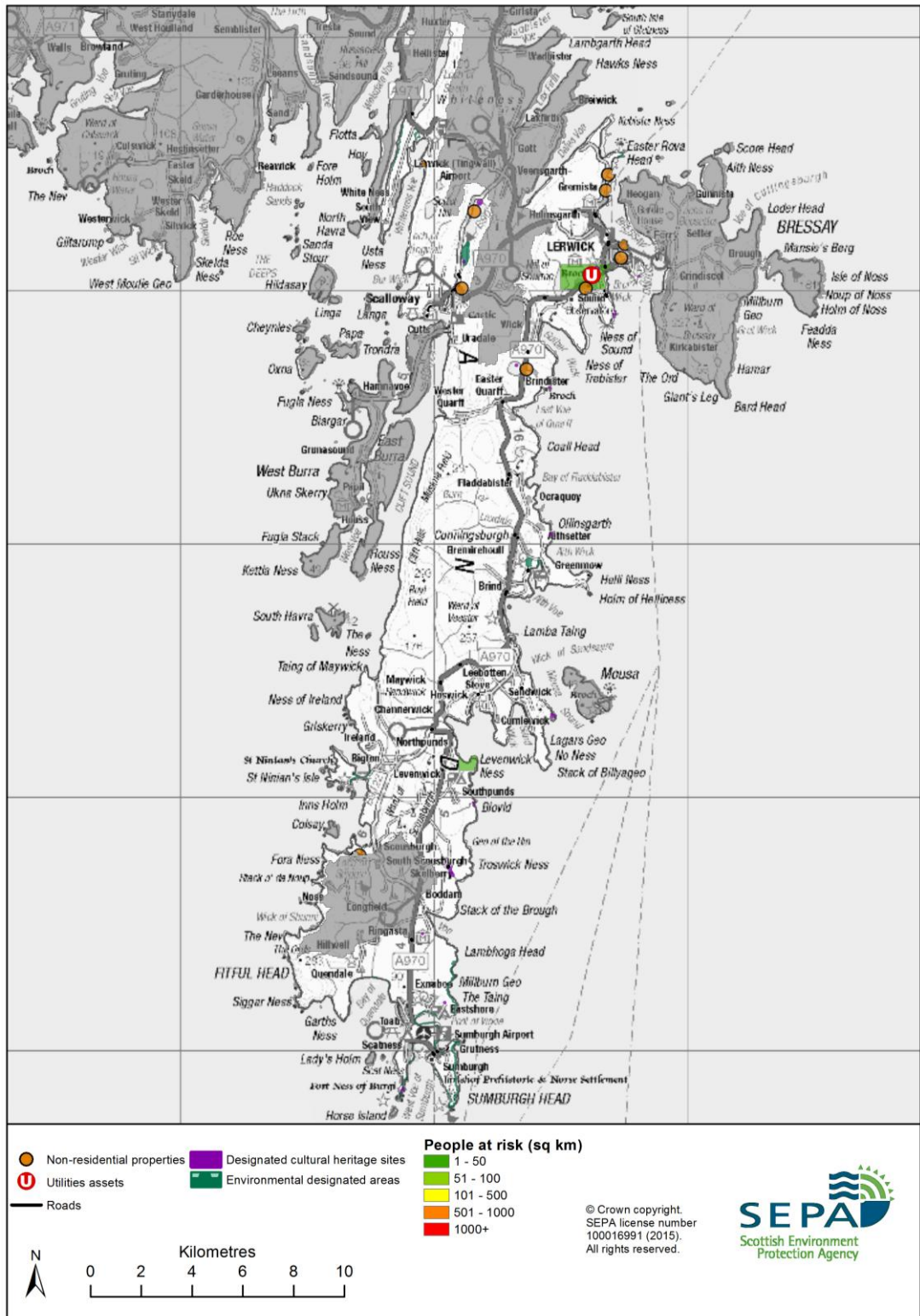


Figure 2.8: Impacts of flooding
 Reproduced from *Shetland Flood Risk Management Strategy*, SEPA (December 2015)

History of flooding

The earliest recorded flood in this Potentially Vulnerable Area was from the sea in 1900, which flooded the harbour and Clickimin areas of Lerwick. Multiple coastal floods have since been recorded, resulting in damage to existing coastal defences and a number of properties being affected.

There have been 16 river and surface water floods since 2003, the majority of which have affected properties. Many of the floods were caused by hill runoff and blockages of drainage infrastructure, such as ditches and gullies. Groundwater flooding occurred in 2004 and 2006 in addition to hill runoff.

The road between Lerwick and the airport at Sumburgh has been affected in the past by landslips (bog and peat slides) during periods of very intense rainfall. There have been flooding problems from the Burns of Laxdale and Mail in Cunningsburgh.

Objectives to manage flooding in Potentially Vulnerable Area 04/03

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.

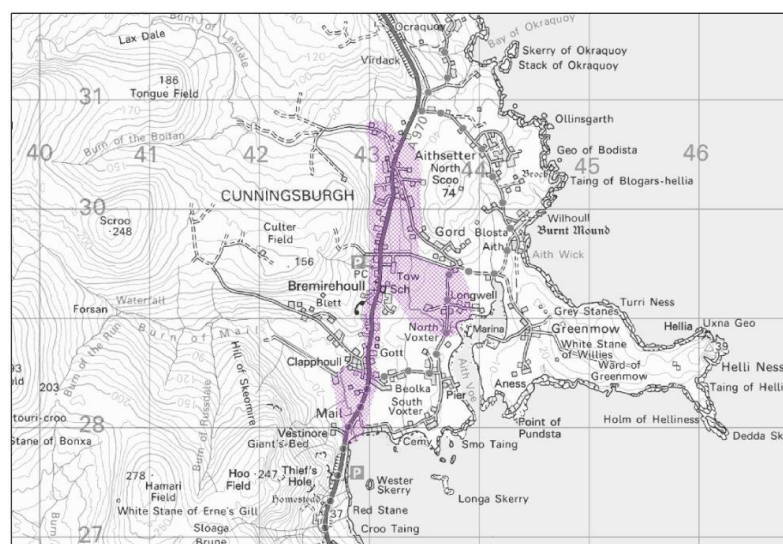
The target areas define the objective focus rather than the area at flood risk. The objectives below have been set for the Shetland Mainland Central and South Potentially Vulnerable Area.

Reduce risk in the Cunningsburgh area from river and surface water flooding

Indicators:

- A970 road at Cunningsburgh

Objective ID:
400301



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Table 2.13: Summary of flooding impacts in PVA 04/03

Target area	Objective(s)	ID	Indicators within PVA
Lerwick and Scalloway	Reduce risk from surface water flooding in Lerwick and Scalloway	400305	* See note below
Applies across Shetland LPD	Avoid an overall increase in flood risk	400001	<ul style="list-style-type: none"> • <10 residential properties • £43,000 Annual Average Damages
Applies across Shetland LPD	Reduce overall flood risk	400002	<ul style="list-style-type: none"> • <10 residential properties • £43,000 Annual Average Damages

* This objective will be monitored using surface water flood risk in the Potentially Vulnerable Area. For PVA 04/03 there are <10 residential properties at risk and Annual Average Damages of £20,000.

Actions to manage flooding in PVA 04/03

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 in Table 2.14 and then described below have been selected as the most appropriate for the Shetland Mainland Central and South Potentially Vulnerable Area.

Table 2.14: Summary of selected actions in PVA 04/03

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 (4003010005)		
Objective (ID):	Reduce risk in the Cunningsburgh area from river and surface water flooding (400301)		
Delivery lead:	Shetland Islands Council		
Rank:	National:	By local authority area:	
	156 of 168	3 of 3	
Status:	Not started	Delivery:	2019 – 2020
Description:	<p>The A970 is the key road linking the southern end of the mainland, including the airport at Sumburgh, to the rest of Shetland. Flooding in the Cunningsburgh area causes significant disruption to residents, commuters, and visitors.</p> <p>A study should be undertaken to assess direct defences upstream of the A970 on the Burn of Laxdale and Burn of Mail and improvements to the conveyance through the culverts underneath the road.</p> <p>Other actions may also be considered to develop the most sustainable range of options.</p>		
Potential impacts			
Economic:	<p>The study should confirm the economic impacts and number of properties at risk. Currently it is estimated that one residential and one non-residential property, along with the A970 (key road linking the southern end of Mainland, including the airport at Sumburgh to the rest of Shetland) are at risk. The history of flooding however suggests that the potential benefits are likely to be higher.</p>		
Social:	<p>The A970 is the key road linking the southern end of Mainland, including the airport at Sumburgh, to the rest of Shetland. Flooding in the Cunningsburgh area causes significant disruption to residents, commuters and visitors. 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.</p>		
Environmental:	<p>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 improving the culverts beneath the A970 for habitats and fish passage. The proposed works and the burns which they affect are located outside of the Aith Meadows and Burn of Aith Site of Special Scientific Interest.</p>		

Coordination arrangement:	<p>Discussion will take place with SEPA hydrologists to determine if there is a crossover of useful information.</p> <p>Results may help to inform future revisions of SEPA's flood maps</p>
Funding:	<p>Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.</p>

Action (ID):	SURFACE WATER PLAN/STUDY (4003050018)		
Objective (ID):	Reduce risk from surface water flooding in Lerwick and Scalloway (400305)		
Delivery lead:	Shetland Islands Council		
Status:	Not started	Delivery:	2017-2020
Description:	<p>Existing flood risks are known from historical incidents, particularly on the South Burn of Gremista in Lerwick and at the Burn Beach outfall in Scalloway The study will consider interactions with surface water, the drainage systems and the sea. Additional data and information will be procured or surveys commissioned to generate data to inform the study, establish the levels of risk and, if appropriate, progress to identify the most sustainable range of actions to address or mitigate the flood risks at specific locations.</p> <p>There are existing land use planning restrictions on upstream development in both catchments and the study will generate improved public engagement and understanding of those issues and the resulting implications for future developments.</p> <p>Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 studies, to assist with the surface water management planning process.</p>		
Coordination:	<p>There are identified flood risks at locations involving Council, Scottish Water and third party properties and drainage infrastructure.</p> <p>SIC will lead the investigation of the catchments, but consideration of options and future work leading on from that will involve a wide range of groups.</p> <p>Scottish Water will work with Shetland Isles Council and support surface water management planning through ensuring that best available knowledge and data is used to input into the Surface Water Management Plans.</p>		
Funding:	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (4000020019)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Scottish Water		
Status:	Not started	Delivery:	2016-2019
Description:	Scottish Water will undertake further investigation and modelling in the Lerwick and Maa Ness sewer catchments to improve knowledge and understanding of flood risk in these areas as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.		
Coordination:	Scottish Water will work with Responsible Authorities to incorporate relevant information into these studies by regularly keeping the Responsible Authorities informed of their progress. Scottish Water will provide Responsible Authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform Surface Water Management Plans and SEPA flood hazard and risk maps.		
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.		

Action (ID):	FLOOD FORECASTING (4000020009)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	SEPA		
Status:	Existing	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.</p> <p>The flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding.</p> <p>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 Areas are within the 'Shetland' flood alert area.</p>		
Coordination:	<p>SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.</p> <p>Warnings received are circulated to the Council's Severe Weather email list as it the possibility of flooding is usually linked to high winds in a particular direction together with high tides / storm surge.</p>		
Funding:	<p>SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.</p> <p>Council involvement is funded from existing SIC revenue budgets</p>		

Action (ID):	SELF HELP (4000020011)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:			
Status:	Existing	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.		
Coordination:	Where premises are subject to historical flooding the owners are aware of their responsibilities and that flood damage can be reduced by suitable provision and maintenance of drainage and flood protection infrastructure, including property level protection.		
Funding:	General information is made available as part of existing Shetland Islands Council awareness raising activities. There are no existing specific Council budgets for funding self help works.		

Action (ID):	AWARENESS RAISING (4000020013)		
Objective (ID):	Reduce overall flood risk. (400002)		
Delivery lead:	Responsible Authorities		
Status:	Ongoing	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>Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Shetland Islands Council will seek to improve communication with the public over flood risk, including how risks can be avoided or mitigated, how warnings of potential flooding events are given and how the council can raise public understanding of actions they can take to protect themselves.</p> <p>A Scottish Government initiative on awareness raising in Schools is planned, with input from SIC services.</p> <p>Scottish Water will support SEPA and Responsible Authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at: https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information</p>		
Coordination	<p>The Shetland Islands Council, SEPA and Scottish Water will co-ordinate awareness raising activities with other Responsible Authorities, through the regular Local Plan District Partnerships and Flood Risk Management Local Area Group meetings.</p> <p>More information on the roles of these groups is given in Annex 3</p>		
Funding:	<p>Council involvement is funded from existing SIC revenue budgets</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Action (ID):	MAINTENANCE (4000020007)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Shetland Islands Council, asset / land managers		
Status:	Existing	Delivery:	On-going
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. The Shetland Islands Council Roads Service carry out inspections of Roads bridges and culverts and associated sections of watercourses and produce a schedule of clearance and repair works for priority locations, which is made available for public inspection.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p> <p>Other 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>		
Coordination:	<p>Shetland Islands Council will publish a schedule of planned watercourse inspection, clearance and repair works.</p> <p>Awareness of third party works impacts on watercourses or flood protection infrastructure will be raised with authorities through the required planning permission and/or other required licensing processes and discussions at LPDP and FRM LAG group meetings.</p> <p>Scottish Water will keep Responsible Authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.</p>		
Funding:	Roads Service inspections are funded from existing SIC revenue budgets.		

Action (ID):	EMERGENCY PLANS/RESPONSE (4000020014)		
Objective (ID):	Reduce overall flood risk (400002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Delivery:	On-going
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA.</p> <p>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 the Shetland Emergency Planning Forum (SEPF) and regional and local resilience partnerships. This response may be supported by the work of Scottish Water and voluntary organisations.</p>		
Coordination:	The Shetland Islands Council have a Major Emergency Plan which is a generic contingency plan to enable the Council's response to a major emergency, including flooding.		
Funding:	Emergency Planning and other Council service actions are funded from existing SIC revenue budgets.		

Action (ID):	PLANNING POLICIES (4000010001)		
Objective (ID):	Avoid an overall increase in flood risk. (400001) Reduce overall flood risk. (400002)		
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.</p> <p>For further information on the application of national planning policies see Annex 5 of the LFRMP.</p> <p>Areas in Shetland identified for development in the Local Development Plan have had initial flood risk assessments carried out as part of their consideration.</p> <p>Applications for developments have requirements to address flooding and drainage in a suitable way and a local Supplementary Guidance document gives advice. Applications which fall under the 5m contour (for coastal flood risk) or within the 1 in 200 year flood risk areas on SEPA's flood maps (for surface water and river flood risks) are required to provide more detail to confirm the flood risks have been considered and dealt with.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act.</p>		

	<p>Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by Shetland Islands Council.</p>
<p>Coordination:</p>	<p>Production of the Shetland Local Development Plan and specifically the "Call for Sites" process included a multi-stage consultation with public and other stakeholders.</p> <p>There are consultations with Council and Non-Council stakeholders as part of consideration of planning applications.</p> <p>SEPA's land use planning activities will be co-ordinated with the activities of other Responsible Authorities as required.</p>
<p>Funding:</p>	<p>Development Planning and other Council service input funded from existing revenue budgets</p> <p>SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>

2.8 Other flood risk activities in the Shetland Local Plan District

The Plan presents the actions to manage flood risk in Shetland Local Plan District. These actions are at a LPD-wide scale or are targeted at a specific PVA. In addition to the actions in this Plan, the Shetland Islands Council is undertaking other activities to manage flood risk with the main examples being:

Section 18 & 59: Works of Clearance and Repair

Based on an assessment of the condition of a body of water, local authorities must prepare a schedule of clearance and repair works that would substantially reduce the risk of flooding of land. This is commonly referred to as a Schedule 18, which is made available for public inspection. Under s.59 of the Act, the Shetland Islands Council must carry out the works in the Schedule 18 if it considers that this will contribute to the implementation of actions in the Plan, but that these works will not affect the implementation of actions in this Plan. Details of how to access Schedule 18s for the Shetland Local Plan District are included in Annex 4 of the Plan.

Actions include maintenance and repairs to bridges, culverts and drains. Since 2008 repairs which help manage flood risk have been carried out to structures on the Twart Burn, North Burn, Trondavoe Burn, and Burns of Brigadale amongst others.

Section 56: General Power to manage flood risk

Without affecting the implementation of actions in this Plan, Shetland Islands Council may do anything which it considers will contribute to the implementation of actions in the Plan or is necessary to reduce the risk of a flood which is likely to occur imminently and have serious adverse consequences for human health, the environment, cultural heritage or economic activity in its area.

There are also several existing historical coastal protection structures at various locations throughout Shetland which provide erosion and/or flood protection benefits, including protection to private structures. These are listed below for each PVA.

PVA 04/01 - Summary of existing local actions to manage risk	
Location of Structure	Purpose of Structure
Vidlin Causeway	Erosion
Vidlin School (Lunnasting Primary School)	Flood protection
Lunna House	Erosion
Welcome Inn, Mossbank	Erosion
Sullom Voe Terminal access road	Flood protection
Mavis Grind	Flood protection & erosion
Ollaberry Cemetery	Erosion
Urafirth	Flood protection
Hillswick	Flood protection
Busta, Brae	Flood protection & erosion
Road west of Mulla	Erosion

PVA 04/02 - Summary of existing local actions to manage risk	
Location of Structure	Purpose of Structure
Grunnavoe	Erosion
Reawick Beach access road	Erosion
Tresta	Flood protection & erosion

Weisdale Voe	Erosion
Loch of Hellister	Erosion
Whiteness Brig causeway	Erosion

PVA 04/03 - Summary of existing local actions to manage risk	
Location of Structure	Purpose of Structure
Ireland graveyard access road	Erosion
Sumburgh runway (east and west)	Erosion
Scatness broch car park	Flood protection & erosion
Jarlshof	Flood protection & erosion
Grutness	Flood protection
Nones roadside defence	Erosion
Sandlodge	Flood protection
Cliffs of Cunningsburgh road	Erosion
Lerwick (Sea Road, Widows Homes)	Flood protection & erosion
Clickimin Roundabout	Flood protection
Sletts	Flood protection
Breivick (west, north, & east)	Flood protection
Scottish Water pumping station, Twageos	Protection of infrastructure
South Commercial Street (Dukes Neb, Sea Scouts, Quendale House, & Queens Beach)	Flood protection & erosion
North Ness	Flood protection & erosion
Outside Skippidock harbour	Flood protection & erosion

Lerwick power station	Erosion
Arlanda, Shetland Catch	Port structures
Lerwick Harbour Trust laydown area (Greenhead)	Port structures
Scalloway (Mill Brae, Youth Centre, Main Street car park, Fisheries College)	Erosion & flood protection
Burn Beach	Flood protection
Kiln Cottage	Flood protection
Shetland Bus Memorial	Flood protection
Port Arthur	Flood protection
Dales Voe Pier	Port structures

Annex 1: Shetland LFRMP Actions

The Act requires Scottish Government to have regard to the Strategy and Local Flood Risk Management Plan when allocating funding to SEPA and Responsible Authorities. The delivery of the above actions in the first Flood Risk Management Plan cycle from 2016-2022, as detailed in the Local Flood Risk Management Plan, is therefore subject to revenue and capital funding allocations from Scottish Government to SEPA and Responsible Authorities; and to revenue and capital budget setting by councils and other Responsible Authorities over the period 2016-2022.

LPD-wide / PVA	Selected Action	Location	Objective	Description	Coordination	Funding	Prioritisation			Proposed lead responsible authority	Proposed delivery period
							National	LPD	LA		
PVA 04/01	Vidlin Flood Protection Study (4001010005)	Vidlin coastal area	Reduce risk of coastal flooding in Vidlin (400101)	Flood modelling in the Vidlin area suggests that properties and infrastructure may be at risk of coastal flooding, but there is uncertainty about the accuracy of the base level information used in that assessment. As a first step the SIC will carry out surveying of areas where property may be at risk, to better understand the actual level of risk. If an improved understanding does confirm a significant flood risk to property or infrastructure, the study should progress to identify the most sustainable range of actions to address this.	The survey and study will be carried out after discussion with SEPA hydrologists to ensure the information is as useful and relevant as possible. Results may help to inform future revisions of SEPA's flood maps	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.	154	2	2	Shetland Islands Council	Survey and analysis in 2017-2018, with any resulting further work then subject to prioritisation and funding
PVA 04/02	Walls Flood Protection Study (4002010005)	Walls coastal area	Reduce risk of coastal flooding in Shetland Mainland West (400201)	Flood modelling in the Walls area suggests that properties and infrastructure may be at risk of coastal flooding, but there is uncertainty about the accuracy of the base level information used in that assessment. As a first step the SIC will carry out surveying of areas where property may be at risk, to better understand the actual level of risk. If an improved understanding does confirm a significant flood risk to property or infrastructure, the study should progress to identify the most sustainable range of actions to address this.	The survey and study will be carried out after discussion with SEPA hydrologists to ensure the information is as useful and relevant as possible. Results may help to inform future revisions of SEPA's flood maps	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.	138	1	1	Shetland Islands Council	Survey and analysis in 2018-2019, with any resulting further work then subject to prioritisation and funding
PVA 04/03	Cunningsburgh Flood Protection Study (4003010005)	Cunningsburgh - Burn of Mail and Burn of Vaxter	Reduce risk in the Cunningsburgh area from river and surface water flooding (400301)	The A970 is the key road linking the southern end of the mainland, including the airport at Sumburgh, to the rest of Shetland. Flooding in the Cunningsburgh area causes significant disruption to residents, commuters, and visitors. A study should be undertaken to assess direct defences upstream of the A970 on the Burn of Laxdale and Burn of Mail and improvements to the conveyance through the culverts underneath the road. Other actions may also be considered to develop the most sustainable range of options.	Discussion will take place with SEPA hydrologists to determine if there is a crossover of useful information. Results may help to inform future revisions of SEPA's flood maps	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.	156	3	3	Shetland Islands Council	Survey and analysis in 2019-2020, with any resulting further work then subject to prioritisation and funding
PVA 04/03	Surface Water Plan/Study covering Lerwick and Scalloway (4003050018)	Lerwick South Burn of Gremista. Scalloway Burn Beach	Reduce risk from surface water flooding in Lerwick and Scalloway (400305)	Existing flood risks are known from historical incidents, particularly on the South Burn of Gremista in Lerwick and at the Burn Beach outfall in Scalloway. The study will consider interactions with surface water, the drainage systems and the sea. Additional data and information will be procured or surveys commissioned to generate data to inform the study, establish the levels of risk and, if appropriate, progress to identify the most sustainable range of actions to address or mitigate the flood risks at specific locations. There are existing land use planning restrictions on upstream development in both catchments and the study will generate improved public engagement and understanding of those issues and the resulting implications for future developments. Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 studies, to assist with the surface water management planning process.	There are identified flood risks at locations involving Council, Scottish Water and third party properties and drainage infrastructure. SIC will lead the investigation of the catchments, but consideration of options and future work leading on from that will involve a wide range of groups. Scottish Water will work with Shetland Islands Council and support surface water management planning through ensuring that best available knowledge and data is used to input into the Surface Water Management Plans.	Council delivery of this action will be covered under existing revenue budgets, including survey and design work of approximately £15k.	-	4	4	Shetland Islands Council	Survey and outline design work in 2017-2020 for specific works in the priority areas with any resulting construction works then subject to prioritisation and possible third party agreement / contribution
PVA 04/03	Strategic mapping and modelling (4000020019)	Lerwick DOA/Maa Ness DOA	Reduce overall flood risk (400002)	Scottish Water will undertake further investigation and modelling in the Lerwick and Maa Ness sewer catchments to improve knowledge and understanding of flood risk in these areas as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.	Scottish Water will work with Responsible Authorities to incorporate relevant information into these studies by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform Surface Water Management Plans and SEPA flood hazard and risk maps.	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.				Scottish Water	2016-2019
LPD Wide	Flood Forecasting (4000020009)	LPD Wide	Reduce overall flood risk. (400002)	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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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 Areas are within the 'Shetland' flood alert area.	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding. Warnings received are circulated to the Council's Severe Weather email list as it the possibility of flooding is usually linked to high winds in a particular direction together with high tides / storm surge.	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government. Existing SIC revenue budgets	-	-	-	SEPA	On-going
LPD Wide	Self Help (4000020011)	LPD Wide	Reduce overall flood risk. (400002)	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 the Resilient Communities Initiative, and ensuring that properties and businesses are insured against flood damage.	Where premises are subject to historical flooding the owners are aware of their responsibilities and that flood damage can be reduced by suitable provision and maintenance of drainage and flood protection infrastructure, including property level protection.	General information is made available as part of existing Shetland Islands Council awareness raising activities. There are no existing specific Council budgets for funding self help works.	-	-	-		On-going

LPD-wide / PVA	Selected Action	Location	Objective	Description	Coordination	Funding	Prioritisation			Proposed lead responsible authority	Proposed delivery period
							National	LPD	LA		
LPD Wide	Awareness Raising (4000020013)	PVA 04/01	Reduce overall flood risk. (400002)	<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>Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Shetland Islands Council will seek to improve communication with the public over flood risk, including how risks can be avoided or mitigated, how warnings of potential flooding events are given and how the council can raise public understanding of actions they can take to protect themselves.</p> <p>A Scottish Government initiative on awareness raising in Schools is planned, with input from SIC services.</p> <p>Scottish Water will support SEPA and Responsible Authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>More general information and flooding guidance will be available on the website at: https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information</p>	<p>The Shetland Islands Council, SEPA and Scottish Water will co-ordinate awareness raising activities with other Responsible Authorities, through the regular Local Plan District Partnerships and Flood Risk Management Local Area Group meetings.</p> <p>More information on the roles of these groups is given in Annex 3</p>	<p>Council involvement is funded from existing SIC revenue budgets</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>	-	-	-	Shetland Islands Council and SEPA	On-going
LPD Wide	Maintenance (4000020007)	LPD Wide	Reduce overall flood risk. (400002)	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. The Shetland Islands Council Roads Service carry out inspections of Roads bridges and culverts and associated sections of watercourses and produce a schedule of clearance and repair works for priority locations, which is made available for public inspection.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p> <p>Other 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>	<p>Shetland Islands Council will publish a schedule of planned watercourse inspection, clearance and repair works.</p> <p>Awareness of third party works impacts on watercourses or flood protection infrastructure will be raised with authorities through the required planning permission and/or other required licensing processes and discussions at LPDP and FLAG group meetings.</p> <p>Scottish Water will keep Responsible Authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.</p>	<p>Roads Service inspections are funded from existing SIC revenue budgets</p>	-	-	-	Shetland Islands Council	On-going
LPD Wide	Emergency Response (4000020014)	LPD Wide	Reduce overall flood risk. (400002)	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA.</p> <p>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 Scottish Water and voluntary organisations.</p>	<p>The Shetland Islands Council have a Major Emergency Plan which is a generic contingency plan to enable the Council's response to a major emergency.</p>	<p>Emergency Planning and other Council service actions are funded from existing SIC revenue budgets</p>	-	-	-	Category 1 and 2 Responders	On-going
LPD Wide	Planning policy (4000010001)	LPD Wide	<p>Avoid an overall increase in flood risk. (400001)</p> <p>Reduce overall flood risk (400002)</p>	<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.</p> <p>For further information on the application of national planning policies see Annex 4 of the LFRMP.</p> <p>Areas in Shetland identified for development in the Local Development Plan have had initial flood risk assessments carried out as part of their consideration.</p> <p>Applications for developments have requirements to address flooding and drainage in a suitable way, and a local Supplementary Guidance document gives advice. Applications which fall under the 5m contour (for coastal flood risk) or within the 1 in 200 year flood risk areas on SEPA's flood maps (for surface water and river flood risks) are required to provide more detail to confirm the flood risks have been considered and dealt with.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act.</p> <p>Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/ Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by Shetland Islands Council.</p>	<p>Production of the Shetland Local Development Plan and specifically the "Call for Sites" process included a multi-stage consultation with public and other stakeholders.</p> <p>There are consultations with Council and Non-Council stakeholders as part of consideration of planning applications.</p> <p>SEPA's land use planning activities will be co-ordinated with the activities of other Responsible Authorities as required.</p>	<p>Development Planning and other Council service input funded from existing revenue budgets</p> <p>SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>	-	-	-	Shetland Islands Council and SEPA	On-going

Annex 2: LPD roles & responsibilities

1. Roles and responsibilities for Flood Risk Management Planning

Individuals are the first line of defence against flooding. However, public bodies have responsibilities too and are working together to reduce the impacts of flooding in Scotland. Responsibility for Flood Risk Management Planning falls in the main to SEPA, local authorities and Scottish Water. However, individuals have a personal responsibility to protect themselves and their property.

Some of the key roles are outlined below and more information is available from the SEPA website.

Your responsibilities

Organisations and individuals have responsibilities to protect themselves from flooding. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life.

The first step to being prepared is signing up to the [Floodline Scotland](#) online service, so you can receive messages to let you know where and when flooding is likely to happen. Other useful tools and advice on how to be prepared are available on the [Floodline](#) website including a quick guide to who to contact in the event of a flood. You can also check how your area could be affected by flooding by looking at [SEPA's flood maps](#).

SEPA

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority and has a statutory duty to produce Scotland's Flood Risk Management Strategies. As described above, SEPA work closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted.

SEPA also has a responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced. Natural flood management is the use of the natural features of the land to store and slow down the flow of water.

In running Floodline, SEPA provide live flooding information and advice on how to prepare for or cope with the impacts of flooding 24 hours a day, seven days a week. To help forecast for flooding SEPA work closely with the [Met Office](#).

To raise awareness of flooding at a national level SEPA runs education initiatives, community engagement programmes and an annual campaign to promote the useful

advice and information available through Floodline. SEPA work in partnership with local authorities, Neighbourhood Watch Scotland, Ready Scotland and others to share resources and help to promote preparedness and understanding of how flood risk is managed.

Local authorities

Local authorities work together for Flood Risk Management Planning purposes through a single lead authority which has the responsibility to produce a Local Flood Risk Management Plan. Local authorities have been working collaboratively in the manner described above to develop these.

It is the responsibility of Shetland Islands Council to implement its flood protection actions agreed within the Flood Risk Management Strategy, including new schemes or works and the requirement to clear and repair watercourses. You can help the Council to manage flooding by letting them know if debris is blocking watercourses or if flood defences are tampered with.

During severe flooding, the Council will work with the emergency services and coordinate shelter for people evacuated from their homes.

Shetland Islands Council is the lead authority for the Shetland Local Plan District and there are no other local authorities in this LPD.

Scottish Water

Scottish Water is a Responsible Authority for flood risk management and is working closely with SEPA, local authorities and others to coordinate plans to manage flood risk.

Scottish Water has the public drainage duty and is responsible for foul drainage and the drainage of rainwater run-off from roofs and any paved ground surface from the boundary of properties. Additionally, Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. Scottish Water is not responsible for private pipework or guttering within the property boundary.

To find out more about waste water flooding visit the [Scottish Water website](#).

Other organisations

- **The Scottish Government** oversees the implementation of the Flood Risk Management (Scotland) Act 2009 which requires the production of Flood Risk Management Strategies and Local Flood Risk Management Plans. Scottish Ministers are responsible for setting the policy framework for how organisations collectively manage flooding in Scotland. Scottish Government has also approved this Flood Risk Management Strategy.
- **Scottish Natural Heritage** has provided general and local advice in the development of this Flood Risk Management Strategies. Flooding is seen as

natural process that can maintain the features of interest at many designated sites, so Scottish Natural Heritage helps to ensure that any changes to patterns of flooding do not adversely affect the environment. Scottish Natural Heritage also provides advice on the impact of Flood Protection Schemes and other land use development on designated sites and species.

- **Utility companies** have undertaken site specific flood risk studies for their primary assets and have management plans in place to mitigate the effects of flooding to their assets and also minimise the impacts on customers.
- **The Met Office** provides a wide range of forecasts and weather warnings. SEPA and the Met Office work together through the Scottish Flood Forecasting Service.
- **The emergency services** provide emergency relief when flooding occurs and can coordinate evacuations. You should call the emergency services on 999 if you are concerned about your safety or the safety of others and act immediately on any advice provided.
- **Historic Environment Scotland** considers flooding as part of their regular site assessments. As such, flooding is considered as one of the many factors which inform the development and delivery of its management and maintenance programmes.
- **The Scottish Flood Forum** is a Scottish charitable organisation that provides support for those who are affected by, or are at risk of, flooding. It provides flood advice, information, awareness, education and training to individuals and communities to help reduce the risk of flooding; in partnership with the local authority, provides support during the recovery process following a flood incident and aims to support the development of resilient communities.

Although not directly relevant to the Shetland Local Plan District, national consultation has also been undertaken with Forestry Commission Scotland, Network Rail and Transport Scotland

Annex 3: Consultation and engagement

The Flood Risk Management Strategy (FRMS) and the Local Flood Risk Management Plan (LFRMP) have been drawn up as part of a long term process of collaborative working involving many different groups, as outlined below:

Local Plan District Partnership (LPDP)

This is a working group of SIC, SEPA and Scottish Water officers, whose primary function to this date has been preparing input and reviewing local aspects of firstly the FRMS documents and then this resulting LFRMP.

Membership:

SIC	Elected member Planning, Roads and Emergency Planning officers
SEPA	Local and Area officers
Scottish Water	Local and Area officers

Flood Risk Management Local Advisory Group (FRM LAG)

This is a wider working group of interested parties overseeing flooding actions and monitoring. The FRM LAG group has had regular progress reports on the work of the LPDP groups work on the FRMS and LFRMP and there is a significant crossover in membership of the two groups.

Membership:

SEPA	Local and Area officers
SIC	Elected member Planning, Roads and Emergency Planning officers
Scottish Water	Local and Area officers

Lerwick Port Authority
Hjaltland Housing Association
Shetland Amenity Trust
RSPB
SNH

Flood Risk Management Strategy (FRMS)

As part of producing the Strategy there was different overlapping streams of national and local, public and authority reporting and consultation.

SEPA produced a national publicity campaign leading up to their public consultation process on the draft FRMS.

Shetland Councillors and Community Councils also received a briefing note on the

consultation and printed copies of the draft Strategy were made available to the public.

Following the consultation, a report was presented to the SIC Development committee updating members of the progress towards the draft FRMS and the results of the public consultation. Members approved the draft strategy for submission for inclusion in the strategy.

Local Flood Risk Management Plan (LFRMP)

This LFRMP looks at how to deliver the recommended actions from the national FRMS, adding local detail and more information on scheduling, coordination and funding.

A report was presented to the SIC Development committee in April 2016 updating members of the progress towards producing the draft LFRMP after publication of the FRMS. Members approved the draft Plan for publication as the Shetland LFRMP.

Future Engagement

There will be ongoing engagement both with raising public awareness of the Plan and its approaches to managing or reducing flood risk and as part of the process of preparing for the update cycle of the FRMP after 2022.

One particular initiative which is already underway seeks to have community resilience officers build connections and engagement with local schools, incorporating flooding processes, community resilience and related local examples of such topics into lessons. www.educationscotland.gov.uk/readyforemergencies

Annex 4: Links to other plans, policies, strategies and legislative requirements

1. **Strategic Environmental Assessment (SEA)**

After wider consultation it is considered that the SEA requirements for the LFRMP have already been addressed in the SEA process carried out by SEPA during production of the national Flood Management Strategies. A document outlining the reasons for this decision is available [here](#).

2. **Habitat Regulations Appraisal (HRA)**

Shetland Islands Council, as the Responsible Authority, considers that the LFRMP will not have a likely significant environmental effect on the conservation objectives or integrity of the identified SAC and SPA sites, and therefore do not consider that an appropriate assessment is required. An HRA document for the LFRMP is available [here](#).

3. **River Basin management Planning (RBMP)**

[SEPA RBMP portal](#)
[RBMP for the Scotland river basin district – summary document](#)
[Shetland and Orkney supplementary document](#)

4. **Scottish Water's investment programme**

This is set out in the Scottish Water Business Plan available on their website [here](#).

5. **S18 Schedule of Clearance and Repair**

The Shetland Islands Council's schedule of clearance and repair under Section 18 of the Flood Risk Management (Scotland) Act 2009 is available [here](#).

6. **Shetland Local Development Plan**

The Shetland Local Development Plan and associated supplementary guidance documents are available [here](#).

Annex 5: Land Use Planning

Flood risk management actions from national planning policies
<p>AVOID DEVELOPMENT IN MEDIUM TO HIGH RISK AREAS</p> <p>a) Planning authorities work in partnership undertaking catchment-wide Strategic Flood Risk Assessments to inform their development plan allocations in line with SEPA’s guidance and Land Use Vulnerability.</p> <p>b) Planning authorities and SEPA require the submission of flood risk assessments that accord with SEPA’s Technical Flood Risk Guidance for Stakeholders, to support planning applications where there is a potential flood risk. The flood risk assessment should be used to demonstrate as far as possible that the development will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, takes opportunities to reduce flood risk overall.</p> <p>c) SEPA ensures that its flood risk advice to planning authorities is clear and appropriate. SEPA, in consultation with planning authorities, undertakes an annual assessment of planning advice and its contribution to flood risk.</p> <p>d) SEPA and planning authorities engage at an early stage of the development plan process to agree appropriate forms of development to help inform the preparation and implementation of Strategic Flood Risk Assessments.</p>
<p>REDUCE IMPACTS TO EXISTING BUILDINGS</p> <p>a) SEPA, planning authorities and local communities are required to engage at an early stage of the development plan process to agree the best long term land uses for areas where relocation, abandonment and/or change of use have been identified to deliver sustainable flood risk management. Where possible, new land uses should aim to achieve multiple benefits for local communities such as the creation of blue / green infrastructure and increased resilience to climate change.</p>

<p>PROTECT AND ENHANCE NATURAL FEATURES THAT HAVE A POSITIVE IMPACT ON REDUCING OVERALL FLOOD RISK</p> <p>a) SEPA and planning authorities are required to engage early in the development plan process to identify opportunities for the restoration and protection of natural features which help manage flood risk. Opportunities should be maximised to achieve multiple benefits such as the development of green / blue infrastructure and improved place making. Areas of land that may contribute to flood management should be identified and protected.</p>
<p>NEW DEVELOPMENTS ARE DESIGNED TO ENSURE THAT SURFACE WATER DRAINAGE DOES NOT INCREASE FLOOD RISK ON OR OFF SITE</p> <p>a) SEPA prepares guidance for planning authorities and developers on the use of surface water hazard maps for land use planning purposes.</p> <p>b) Planning authorities support the implementation of Surface Water Management Plans, developed by the local authorities, through development plan allocations and policies. Surface Water Management Plans should take account of development opportunities that could contribute to the reduction of surface water flood risk.</p> <p>c) SEPA engages at an early stage of the development plan process to progress exemplar projects that demonstrate the potential for land use planning to mitigate surface water flooding and contribute to wider environmental benefits.</p>
<p>NEW DEVELOPMENT IS RESILIENT TO PREDICTED FUTURE CHANGES IN CLIMATE</p> <p>a) Planning authorities ensure that climate change is considered in Strategic Flood Risk Assessments and Flood Risk Assessments, based upon the best scientific evidence and the information requirements of planners to make informed decisions.</p>

Table 1: Objectives and actions that reflect national Land Use Planning policies and guidance

Annex 6: Supporting information

Sources of flooding described in the strategy

The Flood Risk Management Strategy addresses the risk of flooding from rivers, the coast and surface water. The risk of flooding from rivers is usually due to rainfall causing a river to rise above bank level spreading out and inundating adjacent areas. Coastal flooding is where the risk is from the sea. Sea levels can change in response to tidal cycles or atmospheric conditions. Over the longer term sea levels and coastal flood risk may change due to climate change. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. There can be interactions between these sources of flooding, but for the purposes of this strategy they are dealt with independently.

The following aspects of flooding have not been incorporated into the strategy:

Groundwater is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.

Reservoir breaches have been assessed under separate legislation (Reservoirs (Scotland) Act 2011). Further information and maps can be found on SEPA's website.

Coastal Erosion. The Flood Risk Management (Scotland) Act 2009 does not require SEPA or responsible authorities to assess or manage coastal erosion. However, SEPA has included consideration of erosion in the Flood Risk Management Strategies by identifying areas that are likely to be susceptible to erosion and where erosion can exacerbate flood risk. As part of considering where actions might deliver multiple benefits, we have looked to see where the focus of coastal flood risk management studies coincides with areas of high susceptibility to coastal erosion. Subsequent detailed studies and scheme design will need to consider coastal erosion in these areas.

Coastal flood modelling. The information on coastal flooding used to set objectives and identify actions is based on SEPA modelling using simplified coastal processes and flooding mechanisms at work during a storm. Wave overtopping cannot be accurately modelled at a national scale due to the importance of local factors such as prevailing wind conditions, the depth and profile of the near-shore sea bed or the influence of any existing defences or management structures. As a result, coastal flood risk may be underestimated in some areas. Conversely, in locations with wide and flat floodplains, the modelling may overestimate flood risk. To address this, in a number of locations where more detailed local models were available they have been incorporated into the development of the Flood Risk Management Strategies. Where wave overtopping has been specifically identified as a concern – but where no

further detailed modelling is available – particular compensation has been made in the selecting actions to address coastal flood risk.

Commonly used terms

Below are explanatory notes for commonly used terms in the strategy.
A glossary of terms is also available.

- **Reference to flood risk.** During the development of the strategy flood risk has been assessed over a range of likelihoods. For consistency in reporting information within the strategies, unless otherwise stated, all references to properties or other receptors being ‘at risk of flooding’ refer to a medium likelihood flood (up to a 1 in 200 chance of flooding in any given year). By exception, references will be made to high or low risk flooding, which should be taken to mean a 1 in 10 chance/likelihood or 1 in 1000 chance/likelihood of flooding in any given year respectively.

Likelihood of flooding	Return period
High	10 year
Medium	200 year
Low	1000 year

- **Annual Average Damages** have been used to assess the potential economic impact of flooding within an area. Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur.

High likelihood events, which occur more regularly, contribute proportionally more to Annual Average Damages than rarer events. Within the Flood Risk Management Strategies Annual Average Damages incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).

- **History of flooding.** The history of flooding sections of this document report floods that have occurred up to July 2015.

Flood risk management planning process

Flood risk management in Scotland aims to manage flooding in a sustainable way. Sustainable flood risk management considers where floods are likely to occur in the future and takes action to reduce their impact without moving the problem elsewhere. It considers all sources of flooding, whether from rivers, the sea or from surface water. It delivers actions that will meet the needs of present and future generations whilst also protecting and enhancing the environment.

The sustainable approach to managing flood risk works on a six year planning cycle, progressing through the key stages outlined below.

Identifying priority areas at significant flood risk

The first step to delivering a risk-based, sustainable and plan-led approach to flood risk management was SEPA's National Flood Risk Assessment, which was published in 2011. The assessment considered the likelihood of flooding from rivers, groundwater and the sea, as well as flooding caused when heavy rainfall is unable to enter drainage systems or the river network. The likelihood of flooding was examined alongside the estimated impact on people, the economy, cultural heritage and the environment. It significantly improved our understanding of the causes and consequences of flooding, and identified areas most vulnerable to floods.

Based on the National Flood Risk Assessment, SEPA identified areas where flooding was considered to be nationally significant. These areas are based on catchment units as it is within the context of the wider catchment that flooding can be best understood and managed. These nationally significant catchments are referred to as Potentially Vulnerable Areas. In Scotland, 243 Potentially Vulnerable Areas were identified. They are estimated to contain 92% of the total number of properties at risk.

A small number of Candidate Potentially Vulnerable Areas were identified after the National Flood Risk Assessment in light of new information that warranted further assessment and appraisal. They are included in the flood risk management planning process. The National Flood Risk Assessment will be updated to inform each subsequent planning cycle.

Improving the understanding of flooding

SEPA developed flood hazard and flood risk maps between 2012 and 2014. These maps improved our understanding of flooding and helped inform the subsequent selection of actions to manage flood risk in Potentially Vulnerable Areas. The flood hazard maps show information such as the extent of flooding, water level, as well as depth and velocity where appropriate. The flood risk maps provide detail on the impacts on people, the economy, cultural heritage and the environment.

In 2012 SEPA also developed an assessment of the potential for natural flood management. The assessment produced the first national source of information on where natural flood management actions would be most effective within Scotland. Flood hazard and flood risk maps and the assessment of the potential for natural flood management can be viewed on the SEPA website www.sepa.org.uk.

Identifying objectives and selecting actions

The objectives and actions to manage flooding will provide the long-term vision and practical steps for delivering flood risk management in Scotland.

Working collaboratively with local partnerships, SEPA has agreed the objectives for addressing the main flooding impacts. Actions that could deliver these agreed objectives have been appraised for their costs and benefits to ensure the right combinations are identified and prioritised. The actions considered in the development of this strategy include structural actions (such as building floodwalls, restoring flood plains, or clearance and repair works to rivers) and non-structural actions (such as flood warning, land use planning or improving our emergency response). Structural and non-structural actions should be used together to manage flood risk effectively.

An assessment of the potential for natural flood management was used to help identify opportunities for using the land and coast to slow down and store water. Natural flood management actions were recommended in areas where they could contribute to the management of flood risk. In such instances these actions were put forward as part of flood protection or natural flood management studies.

Annex 7: Licensing information

The information described in this Annex relates to the Figures and Maps that have been generated by SEPA and have been reproduced in this Local Flood Risk Management Plan from the Shetland Flood Risk Management Strategy. The Shetland Local Plan District Partners gratefully acknowledges the cooperation and input that various parties have provided, including inter alia, the following organisations:

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Local authorities

Shetland Islands Council acknowledge the provision of flood models and other supporting data and information from local authorities in Scotland and their collaboration in the production of flood risk management information.

Scottish Water

Shetland Islands Council acknowledges the inclusion of surface water flooding data generated by Scottish Water in preparation of flood risk information.

Glossary

Actions

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 has been based on a detailed assessment and comparison of economic, social and environmental criteria.

Annual Average Damages (AAD)

Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur. High likelihood events, which occur more regularly, contribute proportionally more to AADs than rarer events.

Within the Flood Risk Management Strategies AADs incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).

Appraisal

Appraisal is the process of defining objectives, examining options and weighing up the costs, benefits, risks and uncertainties before a decision is made. The FRM Strategy appraisal method is designed to set objectives and identify the most sustainable combination of actions to tackle flooding from rivers, sea and surface water.

Awareness raising

Public awareness, participation and community support are essential components of sustainable flood risk management. SEPA and the Responsible Authorities have a duty to raise public awareness of flood risk. This is undertaken both individually and collaboratively by a range of organisations. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.

Benefit cost ratio (BCR)

A benefit cost ratio summarises the overall value for money of an action or project. It is expressed as the ratio of benefits to costs (both expressed as present value monetary values). A ratio of greater than 1:1 indicates that the economic benefits associated with an action are greater than the economic costs of implementation; therefore this is taken as the threshold of economic viability. It should be acknowledged that it is not always possible to accurately estimate economic values for all elements of benefit, and BCR is just one a number of techniques used in appraisal.

Catchment

All the land drained by a river and its tributaries.

Category 1 and 2 Responders (Cat 1/2)

Category 1 and 2 Responders are defined as part of the Civil Contingencies Act 2004 which seeks to minimise disruption in the event of an emergency.

Category 1 Responders are 'core' responders: local authorities, police, fire and rescue services, ambulance service, NHS health boards, SEPA and the Maritime and Coastguard Agency.

Category 2 Responders are key co-operating responders in support of Category 1 Responders. These include gas and electricity companies, rail and air transport operators, harbour authorities, telecommunications providers, Scottish Water, the Health and Safety Executive and NHS National Services Scotland.

Characterisation

Provides a description of the natural characteristics of catchments, coastlines and urban areas in terms of hydrology, geomorphology, topography and land use. It also includes the characterisation of existing levels of flood risk and existing flood risk management activity.

Coastal flooding

Flooding that results from high sea levels or a combination of high sea levels and stormy conditions. The term coastal flooding is used under the Flood Risk Management (Scotland) Act 2009, but in some areas it is also referred to as tidal flooding and covers areas such as estuaries and river channels that are influenced by tidal flows.

Combined sewer

Combined sewers transport sewage from homes and industry as well as carrying surface water runoff from gutters, drains and some highways. Heavy or prolonged rainfall can rapidly increase the flow in a combined sewer until the amount of water exceeds sewer capacity.

Combined sewer (overflow) (CSO)

Combined sewer overflows are purposely designed structures to ensure any excess water from sewerage systems is discharged in a controlled way and at a specific managed location.

Community facility

Within the FRM Strategies this term includes: Emergency Services (Police, Fire, Ambulance, Coastguard) Educational Buildings (crèche, nursery, primary, secondary, further, higher and special education premises) Healthcare facilities: hospitals, health centres and residential care homes

Community flood action groups

Community flood action groups are community based resilience groups which, on behalf of local residents and business, help to prepare for and minimise the effects of flooding. They reflect the interests of their local communities and may differ in composition and remit. There are over 60 groups already established in Scotland. The Scottish Flood Forum provides support for both new and existing groups.

Conveyance

Conveyance is a measure of the carrying capacity of a watercourse. Increasing conveyance enables flow to pass more rapidly and reducing conveyance slows flow down. Both actions can be effective in managing flood risk depending on local conditions.

Cultural heritage site

Historic Environment Scotland maintains lists of buildings of special architectural or historic interest; these buildings are referred to as 'listed buildings'. The highest level of designation is a World Heritage Site. Other designations included in this assessment are scheduled monuments, gardens and designed landscapes, and battlefields.

Culvert

A pipe, channel or tunnel used for the conveyance of a watercourse or surface drainage water under a road, railway, canal or other obstacle.

Damages

Flood damages are categorised as direct or indirect i.e. as a result of the flood water itself, or subsequent knock on effects. Damage to buildings and contents caused by flood water are an example of direct damages, whilst loss of industrial production, travel disruption or stress and anxiety are indirect. Some damages can be quantified in monetary terms, and others can only be described. The potential damages avoided by implementation of a flood risk management action are commonly referred to as the benefits of that action. When comparing the effectiveness of different actions, it is useful to consider estimated damages and damages avoided across the lifespan of the action. Within the FRM Strategies, a 100 year appraisal period has been used as standard. This allows costs, damages and benefits across this time frame to be compared in present value terms.

See also 'Annual Average Damages'

Economic impact

An assessment of the economic value of the positive and negative effects of flooding and / or the actions taken to manage floods. Embankment Flood embankments are engineered earthfill structures designed to contain high river levels or protect against coastal flooding. They are commonly grass-covered, but may need additional protection against erosion by swiftly flowing water, waves or overtopping.

Emergency plans / response

Emergency response plans are applicable for all types of flooding. They set out the steps to be taken during flooding in order to maximise safety and minimise impacts where possible. Under the Civil Contingencies Act, Category 1 Responders have a duty to maintain emergency plans. Emergency plans may also be prepared by individuals, businesses, organisations or communities.

Environmental impact

A change in the environment as a result of an action or activity. Impacts can be positive or negative and may vary in significance, scale and duration.

Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is a process which identifies the potential environmental impacts, both negative and positive, of a proposal.

Environmental sites / environmental designated areas / environmentally designated sites

Areas formally designated for environmental importance, such as Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) or Special Areas of Conservation (SAC).

Erosion

A natural process leading to the removal of sediment from a river bed, bank or floodplain or coastline.

Flash flood

A flood that occurs a short period of time after high intensity rainfall or a sudden snow melt. A sudden increase in the level and velocity of the water body is often characteristic of these events, leaving a short time for warning or actions.

Flood

In the terms of the FRM Act, 'flood' means a temporary covering by water, from any source, of land not normally covered by water. This does not include a flood solely from a sewerage system, as a result of normal weather or infrastructure drainage. A flood can cause significant adverse impacts on people, property and the environment.

Flood bund

A constructed retaining wall, embankment or dyke designed to protect against flooding to a specified standard of protection. Flood defence Infrastructure, such as flood walls, embankments or flood storage intended to protect an area against flooding to a specified standard of protection.

Flood extent

The area that has been affected by flooding, or is at risk of flooding from one or more sources for a particular likelihood.

Flood forecasting

SEPA operates a network of over 250 rainfall, river and coastal monitoring stations throughout Scotland that generate data 24 hours a day. This hydrological information is combined with meteorological information from the Met Office. A team of experts then predict the likelihood and timing of river, coastal and surface water flooding. This joint initiative between SEPA and the Met Office forms the Scottish Flood Forecasting Service.

Flood frequency

The probability that a particular size/severity of flood will occur in a given year (see likelihood).

Flood gate

An adjustable, sometimes temporary, barrier used as a flood defence to control the flow of water within a water system or during a flood. Flood gates can also be part of operational flood defences or protect individual buildings or sites.

Flood guard

Flood guards cover a variety of types of door and window barriers that can be fitted to individual properties and operated by the owners / occupiers prior to a flood event. They act as a physical barrier to water entering the property and can provide protection against frequent and relatively shallow flooding.

Flood hazard

In terms of the FRM Act, hazard refers to the characteristics (extent, depth, velocity) of a flood.

Flood hazard map

Flood hazard maps are required by the FRM Act to show information that describes the nature of a flood in terms of the source, extent, water level or depth and, where appropriate, velocity of water. Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website.

Flood Prevention Scheme / Flood Protection Scheme (FPS)

A flood protection scheme, as defined by the FRM Act, is a scheme by a local authority for the management of flood risk within the authority area. This includes defence measures (flood prevention schemes) formerly promoted under the Flood Prevention (Scotland) Act 1961.

Flood protection study

Flood protection studies aim to refine understanding of the hazard and risk associated with flooding in a particular area, catchment or coastline. They will involve detailed assessment of flood hazard and / or risk and may develop options for managing flood risk.

Flood protection works

Flood protection works can include the same flood defence measures that would make up a formal Flood Protection Scheme but without the legal process, protections and requirements that would come by delivering the works as a scheme.

Flood risk

A measure of the combination of the likelihood of flooding occurring and the associated impacts on people, the economy and the environment.

Flood Risk Assessment (FRA)

Flood Risk Assessments are detailed studies of an area where flood risk may be present. These are often used to inform planning decisions, may help to develop flood schemes and have also contributed to the National Flood Risk Assessment.

Flood Risk Management (Scotland) Act 2009 (FRM Act)

The flood risk management legislation for Scotland. It transposes the EC Floods Directive into Scots Law and aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity.

Flood risk management cycle

Under the FRM Act flood risk management planning is undertaken in six year cycles. The first planning cycle is 2015 – 2021. The first delivery cycle is lagged by approximately 6 months and is from 2016 - 2022.

Flood Prevention (Scotland) Act 1961

The Flood Prevention (Scotland) Act 1961 gave local authorities discretionary powers to make and build flood prevention schemes. It was superseded by the Flood Risk Management (Scotland) Act 2009.

Flood Risk Management Local Advisory Groups

FRM Local Advisory Groups are stakeholder groups convened to advise SEPA and lead local authorities in the preparation of Flood Risk Management Plans. SEPA and lead local authorities must have regard to the advice they provide.

Flood Risk Management Plans (FRM Plans)

A term used in the FRM Act. FRM Plans set out the actions that will be taken to reduce flood risk in a Local Plan District. They comprise Flood Risk Management Strategies, developed by SEPA, and Local Flood Risk Management Plans produced by lead local authorities.

Flood Risk Management Strategy (FRM Strategy)

Sets out a long-term vision for the overall reduction of flood risk. They contain a summary of flood risk in each Local Plan District, together with information on catchment characteristics and a summary of objectives and actions for Potentially Vulnerable Areas. Flood risk map complements the flood hazard maps published on the SEPA website providing detail on the impacts of flooding on people, the economy and the environment. Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website.

Flood wall

A flood defence feature used to defend an area from flood water to a specified standard of protection.

Flood Warning area (FWA)

A Flood Warning area is where SEPA operates a formal Flood Monitoring Scheme to issue targeted Flood Warning messages for properties located in the area.

Flood warning scheme

A flood warning scheme is the network of monitoring on a coastal stretch or river, which provides SEPA with the ability to issue Flood Warnings.

Floods Directive

European Directive 2007/60/EC on the Assessment and Management of Flood Risks builds on and is closely related to the Water Framework Directive (see River Basin Management Planning). It was transposed into Scots Law by the Flood Risk Management (Scotland) Act 2009. The Directive requires Member States to assess if all watercourses and coastlines are at risk from flooding, to map the flood extent, assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.

Floodplain

Area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would naturally flow but for the presence of flood defences and other structures where they exist.

Green infrastructure

The European Commission defines green infrastructure as “the use of ecosystems, green spaces and water in strategic land use planning to deliver environmental and quality of life benefits. It includes parks, open spaces, playing fields, woodlands, wetlands, road verges, allotments and private gardens. Green infrastructure can contribute to climate change mitigation and adaptation, natural disaster risk mitigation, protection against flooding and erosion as well as biodiversity conservation.”

Groundwater flooding

This type of flooding is caused by water rising up from underlying rocks or flowing from springs. In Scotland groundwater is generally a contributing factor to flooding rather than the primary source.

Land use planning (LUP)

The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups.

Lead Local Authority

A local authority responsible for leading the production, consultation, publication and review of a Local Flood Risk Management Plan.

Likelihood of flooding

The chance of flooding occurring.

High likelihood: A flood is likely to occur in the defined area on average once in every ten years (1:10). Or a 10% chance of happening in any one year.

Medium likelihood: A flood is likely to occur in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.

Low likelihood: A flood is likely to occur in the defined area on average once in every thousand years (1:1000). Or a 0.1% chance of happening in any one year.

Local Flood Risk Management Plans (Local FRM Plan)

Local Flood Risk Management Plans, produced by lead local authorities, will take forward the objectives and actions set out in Flood Risk Management Strategies. They will provide detail on the funding, timeline of delivery, arrangements and co-ordination of actions at the local level during each six year FRM planning cycle.

Local Plan District

Geographical areas for the purposes of flood risk management planning. There are 14 Local Plan Districts in Scotland.

Local Plan District Partnerships

Each LPD has established a local partnership comprised of local authorities, SEPA, Scottish Water and others as appropriate. These partnerships are distinct from the FRM Local Advisory Groups and they retain clear responsibility for delivery of the FRM actions set out in the Local Flood Risk Management Plans. It is the local partnership that makes decisions and supports the delivery of these plans.

Maintenance

Sections 18 and 59 of the Flood Risk Management (Scotland) Act 2009 put duties of watercourse inspection, clearance and repair on local authorities. In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or defences.

National Flood Management Advisory Group (NFMAG)

The National Flood Management Advisory Group provides advice and support to SEPA and, where required, Scottish Water, local authorities and other Responsible Authorities on the production of FRM Strategies and Local FRM Plans.

National Flood Risk Assessment (NFRA)

A national analysis of flood risk from all sources of flooding which also considers climate change impacts. Completed in December 2011 this provides the information required to undertake a strategic approach to flood management that identifies areas at flood risk that require further appraisal. The NFRA will be reviewed and updated for the second cycle of FRM Planning by December 2018.

Natural flood management (NFM)

A set of flood management techniques that aim to work with natural processes (or nature) to manage flood risk.

Non-residential properties

Properties that are not used for people to live in, such as shops or other public, commercial or industrial buildings.

Objectives

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.

One in 200 year flood

See 'likelihood of flooding' and 'return period'.

Planning policies

Current national planning policies, Scottish Planning Policy and accompanying Planning Advice notes restrict development within the floodplain and limit exposure of new receptors to flood risk. In addition to national policies, local planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.

Potentially Vulnerable Areas (PVA)

Catchments identified as being at risk of flooding and where the impact of flooding is sufficient to justify further assessment and appraisal. There were 243 PVAs identified by SEPA in the National Flood Risk Assessment and these are the focus of the first FRM planning cycle.

Property level protection

Property level protection includes flood gates, sandbags and other temporary barriers that can be used to prevent water from entering individual properties during a flood.

Resilience

The ability of an individual, community or system to recover from flooding.

Responsible Authority

Designated under the FRM (Scotland) Act 2009 and associated legislation as local authorities, Scottish Water and, from 21 December 2013, the National Park Authorities and Forestry Commission Scotland. Responsible Authorities, along with SEPA and Scottish Ministers, have specific duties in relation to their flood risk related functions.

Return period

A measure of the rarity of a flood event. It is the statistical average length of time separating flood events of a similar size. (See likelihood)

Riparian

The riparian area is the interface between land and a river or stream. For the purposes of FRM this commonly refers to the riparian owner, which denotes ownership of the land area beside a river or stream.

River Basin Management Planning (RBMP)

The Water Environment and Water Services (Scotland) Act 2003 transposed the European Water Framework Directive into Scots law. The Act created the River Basin Management Planning process to achieve environmental improvements to protect and improve our water environment. It also provided the framework for regulations to control the negative impacts of all activities likely to have an impact on the water environment.

Scottish Advisory and Implementation Forum for Flooding (SAIFF)

The stakeholder forum on flooding set up by the Scottish Government to ensure legislative and policy aims are met and to provide a platform for sharing expertise and developing common aspirations and approaches to reducing the impact of flooding on Scotland's communities, environment, cultural heritage and economy.

Self help

Self help actions can be undertaken by any individuals, businesses, organisations or communities at risk of flooding. They are applicable to all sources, frequency and scales of flooding. They focus on awareness raising and understanding of flood risk.

Sewer flooding (and other artificial drainage system flooding)

Flooding as a result of the sewer or other artificial drainage system (e.g. road drainage) capacity being exceeded by rainfall runoff or when the drainage system cannot discharge water at the outfall due to high water levels (river and sea levels) in receiving waters.

Site protection plans

Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network.

Shoreline Management Plan (SMP)

A Shoreline Management Plan is a large scale assessment of the coastal flood and erosion risks to people and the developed, historic and natural environment. It sets out a long-term framework for the management of these risks in a sustainable manner.

Site of Special Scientific Interest (SSSI)

Sites of Special Scientific Interest are protected by law under the Nature Conservation (Scotland) Act 2004 to conserve their plants, animals and habitats, rocks and landforms.

Source of flooding

The type of flooding. This can be coastal, river, surface water or groundwater.

Special Area of Conservation (SAC)

Special Areas of Conservation are strictly protected sites designated under the European Habitats Directive. The Directive requires the establishment of a European network of protected areas which are internationally important for threatened habitats and species

Special Protection Areas (SPA)

Special Protection Areas are strictly protected sites classified in accordance with the European Birds Directive. They are classified for rare and vulnerable birds (as listed in the Directive), and for regularly occurring migratory species.

Standard of protection (SoP)

All flood protection structures are designed to be effective up to a specified flood likelihood (Standard of Protection). For events beyond this standard, flooding will occur. The chosen Standard of Protection will determine the required defence height and / or capacity.

Storage area

A feature that can be used to store floodwater, this can be natural in the form of low lying land or manmade such as a reservoir or modified landform.

Strategic Environmental Assessment (SEA)

A process for the early identification and assessment of the likely significant environmental effects, positive and negative, of activities. Often considered before actions are approved or adopted.

Strategic Flood Risk Assessment (SFRA)

A Strategic Flood Risk Assessment is designed for the purposes of specifically informing the Development Plan Process. A SFRA involves the collection, analysis and presentation of all existing and readily available flood risk information (from any source) for the area of interest. It constitutes a strategic overview of flood risk.

Strategic mapping and modelling

Strategic mapping and modelling actions have been identified in locations where SEPA is planning to undertake additional modelling or analysis of catchments and coastlines, working collaboratively with local authorities where appropriate, to improve the national understanding of flood risk.

Surcharge

Watercourses and culverts can carry a limited amount of water. When they can no longer cope, they overflow, or 'surcharge'.

Surface water flooding

Flooding that occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

Surface Water Management Plan (SWMP)

A plan that takes an integrated approach to drainage accounting for all aspects of urban drainage systems and produces long term and sustainable actions. The aim is to ensure that during a flood the flows created can be managed in a way that will cause minimum harm to people, buildings, the environment and business.

Surface water plan/study

The management of flooding from surface water sewers, drains, small watercourses and ditches that occurs, primarily in urban areas, during heavy rainfall. FRM Strategy actions in this category include: Surface Water Management Plans and assessment of flood risk from sewerage systems (FRM Act Section 16) by Scottish Water. These have been selected as appropriate for each Potentially Vulnerable Area.

Sustainable flood risk management

The sustainable flood risk management approach aims to meet human needs, whilst preserving the environment so that these needs can be met not only in the present, but also for future generations.

The delivery of sustainable development is generally recognised to reconcile three pillars of sustainability – environmental, social and economic.

Sustainable drainage systems (SuDS)

A set of techniques designed to slow the flow of water. They can contribute to reducing flood risk by absorbing some of the initial rainfall and then releasing it gradually, thereby reducing the flood peak and helping to mitigate downstream problems. SuDS encourage us to take account of quality, quantity and amenity/biodiversity.

UK Climate Change Projections (UKCP09)

The leading source of climate change information for the UK. It can help users to assess their climate risks and plan how to adapt to a changing climate. The high emissions scenario refers to the SRES A1F1 emission scenario.

See Annex 1 of the UKCP09 Climate change projections report for details.

Utility assets

Within the FRM Strategies this refers to electricity sub stations, mineral and fuel extraction sites, telephone assets, television and radio assets.

Voe

A dialect term, common in place names and used to refer to a small bay or creek in Orkney or Shetland.

Vulnerability

A measure of how likely someone or something is to suffer long-term damage as a result of flooding. It is a combination of the likelihood of suffering harm or damage during a flood (susceptibility) and the ability to recover following a flood (resilience).

Wave energy dissipation

Process by which a wave loses its energy.

Wave overtopping

Wave overtopping occurs when water passes over a flood wall or other structure as a result of wave action. Wave overtopping may lead to flooding particularly in exposed coastal locations.