

# Orkney – Local Plan District (LPD 3)

## Local Flood Risk Management Plan

### Cycle 2 (2022-2028)



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## 1 Flood Risk Management in Orkney

### 1.1 What is a flood risk management plan?

Flood Risk Management Plans are required under the Flood Risk Management (Scotland) Act 2009 and are updated every 6 years.

Flood Risk Management Plans are Scotland's route map for reducing the effects of flooding on our communities. This is key to health, well-being and economic success. They are also important in our response to the climate emergency as flooding is increasing due to climate change.

The Local Flood Risk Management Plan (the Local Plan) for Orkney has been designed to ensure effort to reduce flood risk in this catchment area is coordinated. This is achieved by working in partnership with all organisations responsible for flood risk management and the plan focuses the work of these organisations to where the risk of flooding and benefits of action are greatest. The roles and responsibilities of some of the key organisations involved are set out later in the plan.

The Local Plan sets out how and when actions to reduce the impact of flooding in the Orkney Local Plan District identified in the Suite of National Flood Risk Management Plans (published by SEPA) will be delivered. The Plan identifies where the risk of flooding and benefit of investment is greatest and says how and when actions will be delivered. Flood Risk Management Plans are delivered over six-year cycles. This plan is for Cycle 2 and will be delivered between 2022 and 2028.

The content of the Local Plan has been produced by Orkney Islands Council as the Lead Local Authority for this LPD, in agreement with the designated Responsible Authorities, listed below:

Orkney Islands Council;  
Scottish Water;  
SEPA;

This plan replaces the flood risk management plan for Cycle 1, which was published in 2016.

### 1.2 Managing flooding in Orkney

Flooding needs to be managed sustainably so that flood risk is reduced without moving the problem elsewhere. It must be done in a way that contributes to the health and wellbeing of communities, supports the protection and regeneration of the environment, improves resilience to climate change and enables a sustainable economy. Actions are needed on all sources of flooding – including from rivers, the sea, surface water and groundwater – to meet the needs of present and future generations while also protecting and enhancing the environment.

Using a 6 year planning cycle enables new data, improved techniques and developing knowledge and understanding to be incorporated regularly into the Flood Risk Management approach. Using all the latest information to regularly review our assessment of flood risk forms the foundation of a risk-based, plan-led approach to managing flooding sustainably. We have outlined below the key stages of the flood risk management process.

Progress in cycle 1: 2016-2022

The 2016 local flood risk management plan outlined the long term objectives to tackle flooding in the areas at highest risk within Orkney.

The objectives for each area were agreed and actions were developed to meet these objectives. Actions to reduce flood risk included developing flood studies and flood protection schemes and providing public flood warnings and alerts. Actions to avoid flooding included maintenance of flood defences and storage areas and producing strong planning policies, which prevent development from taking place in flood risk areas.

In 2019 Orkney Islands Council published the interim report for the Orkney LPD. This report gave the status of each action at that time and reported them as red, amber or green:

- Red: The action is running late or over budget and is unlikely to meet its aims.
- Amber: The action is running late or over budget but is still likely to meet its aims.
- Green: The action is complete or is on track to meet its aims.

Actions with a green or amber status can be expected to succeed in working towards their objectives. The final report was published December 2022. These reports are published here. [Local Flood Risk Management Plan \(orkney.gov.uk\)](https://www.orkney.gov.uk/local-flood-risk-management-plan)

## **1.3 How the flood risk management plans were developed**

### **1.3.1 Partnership working**

Many organisations and individuals are involved in flood risk management in Scotland. The causes and effects of flooding are complex, and issues cross the boundaries of neighbouring authorities as well as the responsibilities of different organisations. To be successful, flood risk management needs coordination, as set out in the flood risk management plans. Collaboration by those responsible for flood management is essential along with a commitment to work in partnership with the other organisations and stakeholders who can contribute to the sustainable management of flooding. Partnership working is at the heart of the Plan and will be central to delivery of the objectives and actions set out.

Strong relationships between these organisations were developed through the first cycle of The Plan. Working with these organisations has allowed us to gather local knowledge, expertise and experience from the actions delivered in the first cycle, to inform development of the new plans. The roles and responsibilities of some of the organisations with formal flood risk management responsibilities are set out below. There are a wide range of other stakeholders involved in flood risk management. Some work directly with Responsible Authorities through the local partnerships and advisory groups. Others, by virtue of their interests and activities, deliver direct action which can benefit flood risk management. Through the lifetime of the Plan, we will seek to strengthen existing partnerships and establish new ones to achieve the best outcomes for flood risk management.

### **1.3.2 Roles and responsibilities for flood risk management**

Individuals have a personal responsibility to protect themselves and their property from flooding. However, public bodies have responsibilities too and are working together to reduce the impacts of flooding in Scotland. Some of the key roles are outlined below and more information is available from the Orkney Islands Council website.

## Your responsibilities

It is your responsibility to manage your own flood risk and protect yourself, your family, property or business. There are steps you can take now to be flood prepared and reduce the damage and disruption flooding can have on your life.

- View SEPA's flood maps to check if your area is affected by flooding  
<https://map.sepa.org.uk/floodmaps>
- Sign up to Floodline to receive messages when flooding is forecast in your area  
<https://www.floodlinescotland.org.uk/>
- Know who to contact if flooding happens  
[https://www.sepa.org.uk/media/28952/who\\_to\\_contact\\_2014.pdf](https://www.sepa.org.uk/media/28952/who_to_contact_2014.pdf)

Other useful tools and advice on how to be prepared are available on SEPA's [Floodline](#) website and on the Scottish Flood Forum website.

### a) Local Authorities and Lead Local Authorities

Local authorities are responsible for working together to produce Scotland's local flood risk management plans and work in partnership with SEPA, Scottish Water and other responsible authorities to develop these.

It is the responsibility of local authorities to implement action to manage flooding and maintain flood defences. Local authorities also inspect, clear and repair watercourses to reduce flood risk and routinely maintain road gullies on public roads and highways.

During severe flooding, local authorities will work with the emergency services and co-ordinate shelter for people evacuated from their homes.

### b) SEPA

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. SEPA works in partnership with the Met Office to forecast flooding and operate Floodline to warn the public and emergency responders when flooding is likely. SEPA produces Scotland's flood risk management plans, working closely with other organisations responsible for managing flood risk to ensure that a nationally consistent approach to flood risk management is adopted. SEPA also provides flood risk advice on land use planning when requested and raises awareness of flooding at a national level through education initiatives, community engagement and campaigns.

### c) 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 draining wastewater from properties and businesses, and rainwater run-off from roofs and paved areas within the boundary of properties. Pipework and guttering within the boundary, are the responsibility of the property owner.

Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. This is done in a way that is fair and consistent to customers across the country, with sewer flooding investment prioritised to provide the biggest benefit for customers and the environment first. Currently investment to reduce the risk of sewer flooding is prioritised towards properties that have experienced internal sewer flooding and are at the highest risk of repeat occurrence of sewer flooding during frequent rainfall events.

#### d) Other Organisations

The **Scottish Government** oversees the implementation of the Flood Risk Management (Scotland) Act 2009, which requires the production of flood risk management plans and local flood risk management plans. Scottish Ministers are responsible for setting the policy framework for how organisations collectively manage flooding in Scotland.

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](#), combining SEPA's hydrological expertise with the Met Office's meteorological data to predict the likelihood and timing of river, coastal and surface water flooding.

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.

The **Scottish Flood Forum** aims to reduce the impacts of flooding by providing immediate support and by establishing a network of community resilience groups in flood risk areas, to equip communities to cope with flooding.

#### 1.3.3 Consultation, Engagement and Advice

Further to the strong partnership approach to flood risk management planning in Scotland, it is essential to work with the people and communities that experience and live with the threat of flooding. This ensures that our assessment of the risk is accurate. How flooding is managed should support the communities at risk and effort needs to be targeted to where most can be achieved. Public consultations have been held, jointly with SEPA, during the development of the Plan.

The most recent consultation ran from July 2021 to October 2021 and covered information on the objectives and actions planned for each target area within the Orkney LPD. The consultation was advertised widely by both Orkney Islands Council and SEPA. A summary of the consultation is provided in section 1.3.4.

Orkney Islands Council submitted a Strategic Environmental Assessment (SEA) Screening Report and Screening Determination to the SEA Gateway regarding the actions planned for the Orkney Local Flood Risk Management Plan. All consultees advised that in their opinion a Strategic Environmental Assessment in addition to that carried out by SEPA for the national suite of Flood Risk Management Plans would not be required.

A Habitats Regulations Appraisal (HRA) has been undertaken for the Suite of National Flood Risk Management Plans that has informed the Local Plan. Where the HRA identified mitigation measures to protect the nature interests, these have been incorporated into the Plan, this only includes actions identified in the Suite of National Flood Risk Management Plans. Studies included in the Suite of National Flood Risk Management Plans and the Local Plan may recommend schemes or works that will be the subject of future plans and full assessment would be undertaken as part of the development process. Where studies identify actions likely to have significant effects on qualifying interests of nature sites an appropriate assessment will be required. Where it cannot be shown that there will be no adverse effect on site integrity, proposals will be refused.

### 1.3.4 Consultation Report

A joint consultation was undertaken for both the National and Local Flood Risk Management Plans between 31 July and 31 October 2021. A total of 13 replies were received for the Orkney area. The responses received were split across the following representative groups as follows:

- Members of the public 11 responses
- Community Body 1 response
- Local authority 1 response

Responses to consultation questions can be grouped into the following themes:

- **Public awareness and public safety.**

*Comments received included that first people should first be educated on flood risk, then engaged in the flood risk management process and that business and property owners may not understand flood risk or may even be unlikely to speak to each other about it were made. Other comments related to personal safety, in particular, that of vulnerable members of the community.*

Proposed actions include Awareness Raising and Emergency Plans and Response. OIC will continue to work to raise awareness of roles, responsibilities and sources of information regarding flooding and flood preparedness. Effective use of the most appropriate technologies and platforms are an important part of this.

OIC will continue to work with the Scottish Flood Forum to help property owners in vulnerable locations understand what they can do to maximise safety and minimise damage and disruption in the event of flooding. In particular, we wish to highlight the work done with SFF and flood-affected communities towards the establishment of a flood action group in South Ronaldsay and Burray.

- **Flood Studies from Cycle 1**

*A question asking what happened to the Flood Study previously proposed for a flood-vulnerable location was received.*

Proposed actions include a Shoreline Management Plan (Coastal Adaptive Plan) covering all of the flood and erosion-vulnerable coastline in Orkney. The Coastal Adaptive Plan will use outputs from a new LiDAR survey of the Orkney shoreline and set the strategic policy direction for flooding and identify the most sustainable approaches for managing coastal flood risk. All of the vulnerable locations and settlements previously identified for Flood Studies are covered by this.

- **Recognition of flood risk**

*Comments regarding areas considered unduly designated as being at flood risk and others perceived as not receiving due attention were made.*

Designation of Potentially Vulnerable Areas (PVAs) and Objective Target Areas (OTAs) within them includes factors such as numbers of properties at risk and social vulnerability. However, understanding of risk is based upon mapping and proposed actions include the shoreline management Plan (Coastal Adaptive Plan) as noted above. The LiDAR survey which is to be carried out in 2023 is aimed at improving mapping which, in turn, should improve the understanding of flood risk for all flood and erosion-vulnerable coastal locations in Orkney.

- **Existing flood-related assets and the consideration of Natural Flood Management (NFM) techniques.**

*Comments proposing improvements in the way that existing assets are maintained by organisations and questions seeking reassurance that techniques will not be overlooked were received.*

Actions identified in the Coastal adaptive plan will be developed in collaboration with affected communities relevant Responsible Authorities including Scottish Water and SEPA. The Coastal Adaptive Plan will seek to identify the most sustainable actions and will therefore consider Natural Flood Management (NFM) techniques.

No new actions have been included in the Local Plan as a result of the comments received in the joint consultation with SEPA on proposed actions. However, the comments provide useful insight and will help inform the proposed actions as they are undertaken.

## **1.4 Links with other plans and policies**

### **1.4.1 River basin management planning**

River basin management aims to protect and improve the condition of Scotland's rivers, lochs, estuaries, coastal waters and groundwater. Taking action to reduce flood risk in Scotland provides opportunities to deliver joint objectives for restoration and flood risk management. Coordination between river basin management and flood risk management can reduce flood risk, while also improving water quality and biodiversity. SEPA is leading the delivery of both the river basin management plan and the flood risk management plans so has worked to ensure that there is integration and coordination between them. This coordination, particularly in regard to consultation and engagement, is important for stakeholders who have an interest in the objectives of both plans.

### **1.4.2 Land use and spatial planning**

Land use planning decisions are pivotal to achieving sustainable flood risk management. Flood risk management can have significant implications for the location of development and similarly the location of development can have an impact on flood risk. Actions that deliver national land use planning policies are summarised in Annex 4.

Orkney Islands Council develops and adopts a new Local Development Plan. The Local Development Plan sets out the Council's strategy for delivering appropriate development in Orkney, considering a number of potential constraints, including flooding. The current plan was adopted in April 2017.

### **1.4.3 Emergency planning and response**

Emergency planning and response is undertaken by Category 1 and 2 responders including Police Scotland, the Scottish Fire and Rescue Service, the Scottish Ambulance Service, both local authorities, the NHS, the Met Office and SEPA. Emergency plans are prepared under the Civil Contingencies Act 2004. Orkney Islands Council produces Emergency plans, while Orkney Local Emergency Co-ordination Group (OLECG) is a member of the Highlands and Islands Local Resilience Partnership. These partnerships coordinate the emergency response to flood events, such as road closures, evacuations and temporary accommodation.

### **1.4.4 Scottish Water investment plans**

There is a close relationship between Local Flood Risk Management Plans and Scottish Water's 25 year strategic plan. Sewer flooding is not considered in detail in the Flood Risk Management Plans as it remains a high priority for Scottish Water and its customers.



Scottish Water's close involvement in flood risk management planning aims to ensure that there is strong coordination between the management of sewer flooding and wider surface water flood risk, and the actions to be taken forward by local authorities and others.

#### **1.4.5 Duty to assess bodies of water and schedule clearance and repair works**

The duty to assess bodies of water and schedule clearance and repair works lies with Orkney Islands Council.

Orkney Islands Council has a risk-based approach to the assessment bodies of water that may give rise to flooding. Due to limited scale of catchments and burns in Orkney, flood risk associated with watercourses predominantly associated with culverts and their screens. Where potential flood risk has been identified the relevant water body has been included in the Council's routine inspection schedule.

### **1.5 Next steps and monitoring progress**

Orkney Islands Council and the other responsible authorities are committed to continue to work together, improving the understanding and response to flooding and managing flood risk for the good of Scotland through this and subsequent planning cycles.

Progress will be monitored throughout the years covered by this plan through ongoing joint working arrangements under the Local Plan District partnerships. Lead local authorities will provide an interim report on the progress of delivering all actions in the local flood risk management plans not earlier than 2 years and not later than 3 years from its publication. A final report will also be prepared at the end of the second planning cycle. A third set of flood risk management plans and local flood risk management plans will be published in 2027/2028.

#### **1.5.1 Funding review for future Local flood risk management actions**

The distribution of Scottish Government grant funding for actions in the plan for the period 2022 – 2028 is currently being considered by a flood risk management working group<sup>1</sup>. This group will put forward options and recommendations to Scottish Ministers and COSLA, through the Settlement and Distribution Group, for consideration. A decision will not be made in time for the publication of this plan. As such it should be noted that it may not be possible for all actions identified in the Plan to be grant funded. Inclusion of an action in this plan does not formally commit a Council to implement it, if reasons arise which make any actions undeliverable, including inability to secure adequate funding.

This plan remains the best understanding of the objectives and actions required over the long term to manage flood risk in the identified high risk areas within this LPD. The delivery of the Plan, particularly the ambitions on how quickly actions can be delivered, may have to be adapted to reflect wider developments in public funding, the ability of responsible authorities to access funding from other sources, pandemic recovery, and other national priorities.

#### **1.5.2 Licensing acknowledgements**

Full data licensing acknowledgements can be found in Annex 4 of this plan.

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<sup>1</sup> Membership of the group includes representatives from Scottish Government, the Convention of Scottish Local Authorities (COSLA), local authorities, Society of Chief Officers of Transportation in Scotland (SCOTS) flood risk management group and SEPA.

## 2 Managing Flood Risk in Orkney

### 2.1 Local Flood Risk Management Plans 2022 – 2028

The Orkney Local Plan District covers an area of around 1,000km<sup>2</sup> and has a population of approximately 23,000 people. It includes all of the Orkney Islands, 20 of which are inhabited.

The majority of the islands comprise low-lying flat ground with hills on the Mainland, Rousay and Hoy. Land cover is dominated by agricultural land (predominantly improved grassland) with heather and wetlands also significant. There are a number of large inland lochs in the area including Loch of Harray and Loch of Stenness. The coastline has a total length of approximately 860km, much of it soft and easy to erode.

The main risk of flooding in Orkney is from coastal flooding. Orkney has been affected by several floods, notably widespread coastal flooding in January 2005. Heavy rain caused significant surface water and river flooding across Orkney in October 2006 with Kirkwall particularly badly affected. The Churchill Barriers, which are vital transport links between islands, are frequently disrupted by wave overtopping. Erosion of the soft coastline around Orkney is also of significance.

Currently it is estimated that there are 2,300 people and 1,900 homes and businesses at risk from flooding. This is estimated to increase to 2,700 people and 2,200 homes and businesses by the 2080s due to climate change. The annual cost of flooding is approximately £4.8 million. Note however that flooding from wave overtopping is not fully represented in the assessment of flood risk and the impact of coastal flooding may be underestimated.

SEPA lead development of the flood risk management plans for Scotland and delivery of flood warning services. Local flood risk management planning is led by Orkney Islands Council. The other responsible authority in this district is Scottish Water. They are supported by Scottish Government agencies including Forestry and Land Scotland, Scottish Forestry and Transport Scotland.

Within this Local Plan District, actions are regularly carried out by SEPA and responsible authorities to help prepare communities for potential flooding and reduce the impact of any flooding that does occur.

## 2.2 Actions across the Local Plan District

Responsible authorities carry out actions in all areas of the LPD which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. The following actions are due to take place over the next 6 years, and most of these are carried out on an ongoing basis.

	<b>Awareness raising</b>
<b>Action</b>	<p>SEPA, the Responsible Authorities and other organisations such as the Scottish Flood Forum work together through national and local initiatives to help communities understand the risk of flooding and what actions individuals can take. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact of flooding.</p> <p>Local authorities will undertake additional awareness raising activities when developing any specific project proposals and will engage with community resilience groups and local communities.</p> <p>Scottish Flood Forum support flood risk communities by raising community awareness, promoting self-help, developing community groups and establish a recovery support programme after a flood.</p>
<b>Funding</b>	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p> <p>Orkney Islands Council's role funded from existing staff budgets.</p>
<b>Co-ordination</b>	Delivery of actions to raise awareness will be coordinated by the responsible authorities through the Local Plan District Partnership.
<b>Timing</b>	2022-2028

	<b>Data to support climate resilience</b>
<b>Action</b>	<p>As Scotland's hydrometric authority, SEPA operates a network of stations to measure river level, flow, rainfall, sea level, loch and groundwater level. The data goes into a long term data archive and is critical to underpin all flood risk management activities including flood warning, flood mapping, design of flood protection and sustainable development as well as supporting a range of regulatory and recreational uses.</p> <p>SEPA will continue to maintain and develop its hydrometric network, contribute to UK and international data archives, and improve and update the datasets used for flood frequency analysis.</p> <p>SEPA will support research and development of data, methods and guidance to improve the evidence on which decisions can be made, and to enable the impact of climate change to be included in all flood risk management activities.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will coordinate with a range of other parties as required to deliver better and more accessible data, and ongoing improvements to the use of the data to underpin flood risk management activities and decisions.
<b>Timing</b>	2022-2028

<b>Emergency plans</b>	
<b>Action</b>	Many organisations, including local authorities, the emergency services and SEPA provide an emergency response to flooding. Emergency plans are prepared and maintained under the Civil Contingencies Act 2004 by Category 1 and 2 Responders and are coordinated through regional and local resilience partnerships, often supported by voluntary organisations. They set out the steps to be taken to maximise safety and minimise impacts during flooding. Emergency plans may also be prepared by individuals, businesses, organisations or communities. Scottish Water is a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.
<b>Funding</b>	Orkney Islands Council provides emergency planning and response through the Council's annual revenue budget.
<b>Co-ordination</b>	Orkney Local Emergency Co-ordination Group.
<b>Timing</b>	2022-2028

<b>Flood forecasting</b>	
<b>Action</b>	<p>The Scottish Flood Forecasting Service is a partnership between SEPA and the Met Office. The service continues to produce a daily, national flood guidance statement, issued to emergency responders, local authorities, and other organisations with flood risk management duties. In 2022 a new 3-day daily Scottish Flood Forecast was launched for the public.</p> <p>As the flood warning authority for Scotland SEPA continues to provide its flood warning service issuing flood alerts and warnings when required, giving people a better chance of reducing the impact of flooding on their home or business.</p>
<b>Funding</b>	SEPA work in partnership with the Met Office and will work closely with all other authorities involved in emergency response to flooding.
<b>Co-ordination</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Timing</b>	2022-2028

<b>Flood warning development framework</b>	
<b>Action</b>	<p>SEPA published a new flood warning development framework in 2022, which details the ambition and strategic actions to maintain and improve the flood warning service across Scotland.</p> <p>SEPA will further develop phase 1 of the Scottish Flood Forecast based on feedback gathered during public beta release before fully launching the service to the public formally in early 2023. Phase 1 is the national 3-day flood forecast and the starting point of SEPA's journey in providing the public with earlier and improved flood information.</p> <p>SEPA will continue to follow the service design approach for phase 2 of the Scottish Flood Forecast, which will provide the public with more localised flood forecast information. User research will determine what information will be displayed on the regional flood forecast webpages. It is anticipated that the final service will bring together all live information such as flood warnings, river levels and rainfall data into a central hub that is easily accessible for the public.</p>

<b>Flood warning development framework</b>	
	Working in close partnership with the Met Office through the Scottish Flood Forecasting Service, SEPA will develop its capability in surface water flooding forecasting, focusing initially on the transport sector to support climate-ready infrastructure. SEPA will also undertake a prioritised improvement programme of existing river and coastal flood warning schemes to provide more accurate forecasting with improved lead time.
<b>Funding</b>	SEPA work in partnership with the Met Office. Appropriate engagement with the other authorities involved in emergency response will happen as the flood warning developments are progressed.
<b>Co-ordination</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Timing</b>	2022 - 2028

<b>Future flood risk management planning</b>	
<b>Action</b>	<p>The years covered by the lifetime of this plan are crucial. Radical progress is needed in how we reduce our impact on the climate and respond to the effects of climate change. How we plan to manage flooding to our communities is on the front line of the challenges of this decade. The 2027 SEPA flood risk management plans will be more ambitious than ever before. The plans will look to develop long term plans for more flood resilient communities prepared for the impacts of climate change and the 2028 Local Flood Risk Management plans will provide detail.</p> <p>The priority areas which will be the focus points of the next flood risk management plans will be identified in 2024 with the designation of PVAs. A 3-month public consultation will be held to inform the PVA designation.</p> <p>SEPA will plan for a better future by publishing the flooding services strategy in 2023 with a clear and measurable delivery plan. This will put greener, fairer communities at the heart of SEPA's ambitions.</p> <p>SEPA has set its own target to be a regenerative organisation by 2030 and the next set of plans will further this ambition.</p> <p>During this plan cycle, SEPA will work to develop new partnerships with a wider range of stakeholders, including businesses and commercial sectors. We will investigate alternative sources of finance to tackle flooding and drive forward practical options for adaptation.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will lead the work, in partnership with the Scottish Government and other responsible authorities. A wider range of partners and stakeholders will be developed to support the action. SEPA will carry out a full consultation on the next draft flood risk management plans in 2026.
<b>Timing</b>	Ongoing / 2022-2028 Flooding services strategy 2023 Next flood risk management plans 2027

<b>Guidance development</b>	
<b>Action</b>	The Scottish Government and SEPA have developed and updated guidance to inform flood risk management projects. This guidance will be produced in 2022 and will look at how best to adapt to the long-term

<b>Guidance development</b>	
	<p>impacts of climate change and the most appropriate methods of assessing the benefits of flood risk management actions.</p> <p>Technical guidance to support flood risk management partners will be reviewed and updated by SEPA where required.</p> <p>Scottish Forestry, in collaboration with its UK counterparts, will produce guidance on designing and managing forests to reduce flood risk.</p> <p>Guidance will be developed to help local authorities understand the requirements for mapping relevant bodies of water and sustainable urban drainage systems in their areas.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	The Scottish Government, SEPA and Scottish Forestry all have lead roles in delivering the new or updated guidance outlined. A range of forums will be used to help coordinate and develop the guidance with the appropriate input from others, including SAIFF (The Scottish Advisory Implementation Forum for Flooding) and cross-party working groups.
<b>Timing</b>	<p>Draft flood studies guidance (SEPA) 2023</p> <p>Options appraisal &amp; Adaptation guidance (SG &amp; SEPA) 2023</p> <p>Other guidance &amp; updates 2023-2028</p>

<b>Hazard mapping updates</b>	
<b>Action</b>	<p>An understanding of flooding is essential to develop a plan led risk-based approach to flood risk management. SEPA will continue to update their national hazard mapping, which shows the likelihood of flooding in Scotland from different flooding sources:  <a href="https://www.sepa.org.uk/environment/water/flooding/flood-maps/">https://www.sepa.org.uk/environment/water/flooding/flood-maps/</a>.</p> <p>SEPA will continue to develop the hazard mapping viewer to make it easier for the public, partners and stakeholders to access data on the likelihood of flooding. SEPA will also review how modelling and mapping updates are undertaken to develop a more effective method of regional and national updates for the hazard maps.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with other relevant parties - including authorities who have ownership of data used in flood mapping - to develop the quality and accessibility of flood hazard mapping.
<b>Timing</b>	2022-2028

<b>Land use planning</b>	
<b>Action</b>	<p>Local authorities, SEPA and Scottish Water all have a responsibility under the Flood Risk Management (Scotland) Act 2009 to support sustainable flood risk management through the land use planning process. National planning policies set out the Scottish Ministers' priorities for the development and use of land. Under this approach, new development in areas with medium to high likelihood of flooding should generally be avoided.</p> <p>Current national planning policies aim to restrict development within the floodplain and limit exposure of new receptors to flood risk, promote flood</p>

	<b>Land use planning</b>
	<p>reduction via natural and structural flood management measures and restoration of natural features, and avoid increased surface water flooding through sustainable drainage and the minimisation of impermeable surfaces.</p> <p>Locally determined planning policies place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with other relevant parties - including authorities who have ownership of data used in flood mapping - to develop the quality and accessibility of flood hazard mapping.
<b>Timing</b>	2022-2028

	<b>Maintenance</b>
<b>Action</b>	<p>Local authorities have a duty to assess bodies of water and to carry out clearance and repair works where such works would substantially reduce flood risk.</p> <p>Local authorities are also responsible for the drainage of roads. In addition, local authorities may also be responsible for maintenance of any existing flood protection schemes or works.</p> <p>Scottish Water will continue to undertake risk-based inspection, maintenance and repair on the public sewer network.</p> <p>Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>
<b>Funding</b>	The assessment of watercourses, clearance and repair works and maintenance of all council assets are funded from the Council's annual revenue.
<b>Co-ordination</b>	Responsible authorities will inform others of any capital maintenance works to identify opportunities for co-ordination.
<b>Timing</b>	2022-2028

	<b>Natural flood management mapping</b>
<b>Action</b>	<p>SEPA will continue to support activities that improve our understanding of how to effectively target and deliver natural flood management. As part of this, SEPA will review and update the opportunities mapping for natural flood management. This will include linking blue-green infrastructure with the surrounding natural catchment and coastline. Natural flood management seeks to store or slow down flood waters through measures such as the planting of woodlands, wetland creation, river restoration, or the creation of intertidal habitats.</p> <p>In addition to flooding benefits, natural flood management measures can also provide many additional benefits to biodiversity, water quality, recreation, and carbon storage.</p>
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.

<b>Natural flood management mapping</b>	
<b>Co-ordination</b>	SEPA will work with key stakeholders to review and update the opportunities mapping.
<b>Timing</b>	2025

<b>National flood risk assessment</b>	
<b>Action</b>	SEPA will use the most suitable data to review and update the national flood risk assessment (NFRA) undertaken in 2018. This update will be used to identify future potentially vulnerable areas and focus flood risk management planning.
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
<b>Timing</b>	December 2024

<b>National surface water mapping</b>	
<b>Action</b>	The national flood risk assessment 2018 identified that surface water flooding has the potential to impact more properties in Scotland than any other source of flooding. Over the next 6 year cycle SEPA will look to vastly improve its national understanding of surface flood risk by undertaking a wholesale update of the national surface water maps to reflect developments in data and understanding, including the impact of climate change.
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
<b>Timing</b>	December 2024

<b>Reservoirs</b>	
<b>Action</b>	SEPA will continue to develop its assessment of flood risk from dam failure and use these assessments to direct a proportionate regulatory approach to ensure reservoir safety. Over the next management cycle we will implement further developments of our flood warning capabilities in the unlikely event of reservoir failure.
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
<b>Timing</b>	December 2024

<b>Scottish Flood Defence Asset Database</b>	
<b>Action</b>	The Scottish Flood Defence Asset Database provides information on existing flood protection schemes. National data on flood protection infrastructure is needed to understand flood risk and to develop adaptation planning for Scotland. SEPA will continue to host SFDAD and look for opportunities to support the development of our understanding of how and when Scotland's flood defence assets should be adapted to continue to maintain protection from flooding in the future.



<b>Scottish Flood Defence Asset Database</b>	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Co-ordination</b>	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
<b>Timing</b>	December 2024

<b>Self help</b>	
<b>Action</b>	<p>Everyone is responsible for protecting themselves and their property from flooding. People can take 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 flood resilience measures, signing up to Floodline, engaging with their local flood group, and ensuring that properties and businesses are insured against flood damage. The following places offer help with taking steps to protect yourself:</p> <p><a href="https://www.floodre.co.uk/">https://www.floodre.co.uk/</a>  <a href="https://www.biba.org.uk/current-issues/flood-insurance/">https://www.biba.org.uk/current-issues/flood-insurance/</a>  <a href="https://floodlinescotland.org.uk/">https://floodlinescotland.org.uk/</a>  <a href="https://scottishfloodforum.org/">https://scottishfloodforum.org/</a></p> <p>Responsible authorities will continue to develop the understanding of flood risk to communities and promote measures to help individuals and businesses to reduce their risk.</p>
<b>Funding</b>	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p> <p>OIC role funded by the Council's annual revenue.</p>
<b>Co-ordination</b>	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
<b>Timing</b>	Ongoing

More specific local actions to manage flood risk in target areas are detailed in the Potentially Vulnerable Areas (PVAs) sections below.

## 2.3 Potentially Vulnerable Areas

Potentially Vulnerable Areas (PVAs) were designated in 2018 based on the potential current or future risk from all sources of flooding. This designation was informed by the national flood risk assessment (available to view at: <https://www.sepa.org.uk/data-visualisation/nfra2018/>).

As part of continued analysis of flood risk, the national flood risk assessment and potentially vulnerable areas (PVAs) will be reviewed every 6 years to take on board any new information. There are 8 potentially vulnerable areas (PVAs) in the Orkney Local Plan District. Following sections provide more information on these areas.

**Figure 1. Potentially vulnerable areas in the Orkney Local Plan District**



## 2.4 LPD 3 – List of PVAs

Click the blue text to select your area of interest.

<b>PVA Ref &amp; Name</b>
<a href="#">02/03/01 Sanday</a>
<a href="#">02/03/02 Stronsay</a>
<a href="#">02/03/03 Westray</a>
<a href="#">02/03/04 Stromness and Stenness</a>
<a href="#">02/03/05 Kirkwall</a>
<a href="#">02/03/06 Hoy and South Walls</a>
<a href="#">02/03/07 South Ronaldsay</a>
<a href="#">02/03/08 Burray and the Churchill Barriers</a>

#### **2.4.1 02/03/01 Sanday**

Sanday is designated as a potentially vulnerable area due to the risk of coastal flooding. Coastal flood risk is likely to increase due to sea level rise caused by climate change. Some recent coastal flooding occurred during Storm Brendan in January 2020.

There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

Sanday (target area 370)

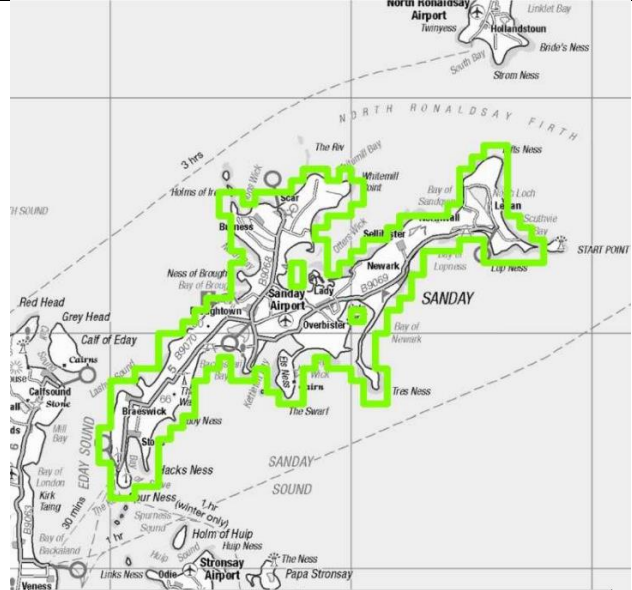
**Local Flood Risk Management plan datasheet**

**2.4.1.1 Sanday (target area 370)**

**Summary**

Sanday is the third largest island in the Orkney Islands Council area. The main source of flooding is coastal flooding. There are approximately 150 people and 180 homes and businesses currently at risk of flooding. This is likely to increase to 170 people and 210 homes and businesses by the 2080s due to climate change. This may be underestimated as the impacts of coastal erosion are not accounted for in SEPA's flood maps. Sites of archaeological importance and the airport may in future be affected by flooding and erosion.

**Location Map**



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**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. There is a long history of coastal flooding in Sanday with notable floods in 1953 and 2005. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3701	Avoid inappropriate development that increases flood risk in Sanday.
Improve data and understanding	3702	Improve data and understanding of the risk of coastal flooding and the impacts of climate change in Sanday.
Prepare for flooding	3703	Prepare for current flood risk and future flooding as a result of climate change in Sanday.

<b>Action ID</b>	<b>Sanday</b>	<b>37001</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan).</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term	

<b>Action ID</b>	<b>Sanday</b>	<b>37001</b>
	(50 to 100 years). Monitoring and data collection activities may be included. The impacts of coastal flood risk and erosion on the low-lying softer parts of the Sanday shoreline are to be assessed as part of the shoreline management plan.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaption planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	The action will be coordinated by Orkney Islands Council.	

<b>Action ID</b>	<b>Sanday</b>	<b>37002</b>
<b>Action Type</b>	<b>Flood Warning Maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

<b>Action ID</b>	<b>Sanday</b>	<b>37003</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

#### **2.4.2 02/03/02 Stronsay**

Stronsay is designated as a potentially vulnerable area due to the risk of coastal flooding in Whitehall. Coastal flood risk is likely to increase due to sea level rise caused by climate change. There is a history of flooding, recently caused by coastal flooding.

There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

Whitehall (target area 371)

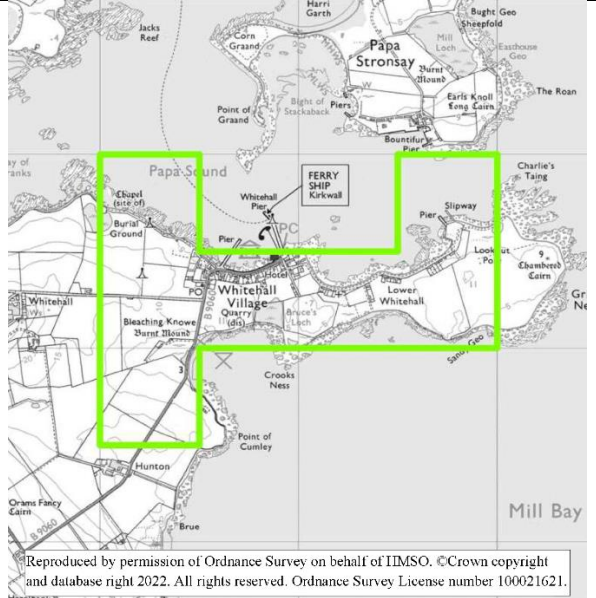
**Local Flood Risk Management plan datasheet**

**2.4.2.1 Whitehall (target area 371)**

**Summary**

Whitehall is located in the north east of Stronsay, which is one of the Orkney Islands. It is in the Orkney Islands Council area. Coastal flooding poses the main flood risk to Whitehall. There are approximately 70 people and 60 homes and businesses currently at risk from flooding, representing a significant proportion of the community. This is likely to increase to 100 people and 80 homes and businesses by the 2080s due to climate change.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. There is a long history of coastal flooding in Whitehall with notable floods in 1953 and 2005. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3711	Avoid inappropriate development that increases flood risk in Whitehall.
Prepare for flooding	3712	Prepare for current flood risk and future flooding in Whitehall as a result of climate change.
Reduce flood risk	3713	Reduce the risk of coastal flooding to Whitehall.

Action ID	Whitehall 37101		
Action Type	Shoreline management plan (coastal adaptive plan)		
Action Delivery Lead	Orkney Islands Council	Indicative Delivery	2023-2024
Description	1st cycle action to undertake a flood study for Whitehall is to be superseded by a new action to develop a shoreline management plan for Orkney in cycle 2. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years).		



<b>Action ID</b>	<b>Whitehall</b>	<b>37101</b>
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	The action will be coordinated by Orkney Islands Council.	

<b>Action ID</b>	<b>Whitehall</b>	<b>37102</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	Indicative Delivery Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from any local flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

<b>Action ID</b>	<b>Whitehall</b>	<b>37103</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	Indicative Delivery 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. SEPA will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with the local authorities on the potential to use information from any flood studies around the Moray Firth coast to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning and engage with communities about the service when required.	

### **2.4.3 02/03/03 Westray**

Westray is designated as a potentially vulnerable area due to the risk of coastal flooding to Pierowall, which has suffered from coastal flooding in the past. Coastal flood risk is likely to increase due to sea level rise caused by climate change.

There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

#### **List of target areas**

Pierowall (target area 440)

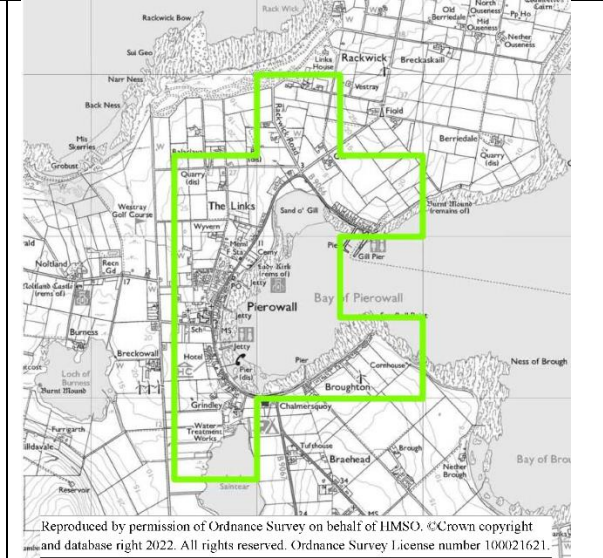
**Local Flood Risk Management plan datasheet**

**2.4.3.1 Pierowall (target area 440)**

**Summary**

Pierowall is located on Westray in the Orkney Islands. The area is within the Orkney Islands Council area. The main risk in Pierowall is from coastal flooding. There are approximately 40 people and 40 homes and businesses currently at risk from flooding. This is likely to increase to 70 people and 70 homes and businesses by the 2080s due to climate change.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. There is a history of coastal flooding in Pierowall including notable floods in 1953 and 2005. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	4401	Avoid inappropriate development that increases flood risk in Pierowall.
Prepare for Flooding	4402	Prepare for current flood risk and future flooding as a result of climate change in Pierowall.
Reduce Flood Risk	4403	Reduce the risk of Coastal flooding in Pierowall.

Action ID	Pierowall		44001
Action Type	Shoreline management plan (coastal adaptive plan)		
Action Delivery Lead	Orkney Islands Council	Indicative Delivery	2023-2024
Description	1st cycle action to undertake a flood study for Pierowall superseded by a new action to develop a shoreline management plan for Orkney in cycle 2. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years).		

<b>Action ID</b>	<b>Pierowall</b>	<b>44001</b>
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Pierowall</b>	<b>44002</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. SEPA will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

<b>Action ID</b>	<b>Pierowall</b>	<b>44003</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

#### **2.4.4 02/03/04 Stromness and Stenness**

Stromness and Stenness is designated as a potentially vulnerable area due to the risk of coastal flooding. Coastal flood risk is likely to increase due to sea level rise caused by climate change. There is a history of coastal flooding in the area. Recently Stromness suffered from coastal flooding due to Storm Brendan.

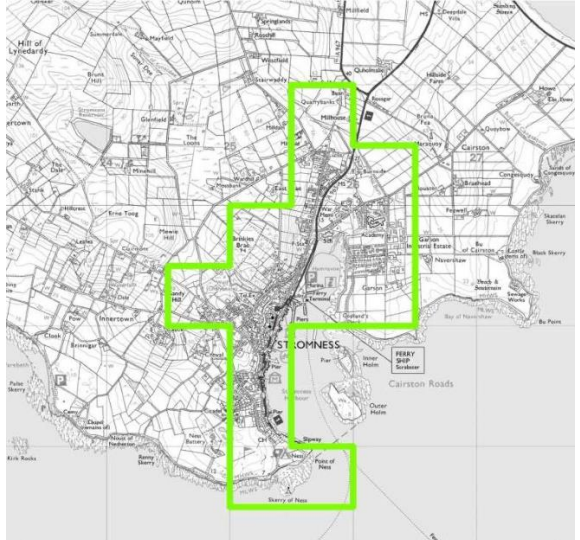
There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

Stromness (target area 372)

**Local Flood Risk Management plan datasheet**

**2.4.4.1 Stromness (target area 372)**

Summary	Location Map
<p>Stromness is the second largest town in the Orkney Islands Council area. It is located in the south west of Mainland. The main source of flooding in Stromness is coastal flooding. There are approximately 190 people and 160 homes and businesses currently at risk of flooding. This is likely to increase to 270 people and 210 homes and businesses by the 2080s due to climate change.</p>	

**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme and for surface water is improved by a sewer flood risk assessment. There is a long history of flooding in Stromness with notable coastal flooding in 1953 and 2005. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3721	Avoid inappropriate development that increases flood risk in Stromness.
Improve data and understanding	3722	Improve data and understanding of the risk of coastal flooding in Stromness.
Prepare for Flooding	3723	Prepare for current flood risk and future flooding in Stromness as a result of climate change.

<b>Action ID</b>	<b>Stromness 37201</b>		
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>		
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b>	2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term		

<b>Action ID</b>	<b>Stromness</b>	<b>37201</b>
	(50 to 100 years). For Stromness it will be important to understand the effects of increased flooding and erosion on the settlement and surrounding infrastructure.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Stromness</b>	<b>37202</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning and engage with communities about the service when required.	

<b>Action ID</b>	<b>Stromness</b>	<b>37203</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

#### **2.4.5 02/03/05 Kirkwall**

This area is designated as a potentially vulnerable area due to the risk of coastal and surface water flooding to Kirkwall, and the risk of coastal flooding to St. Mary's, Graemeshall and the A960 in Deerness. Kirkwall benefits from coastal flood defences.

There are 4 target areas in this potentially vulnerable area, which have been the focus of further assessment, these are listed below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

St Mary's	(target area 373)
Graemeshall	(target area 374)
Kirkwall	(target area 375)
A960 Deerness	(target area 456)



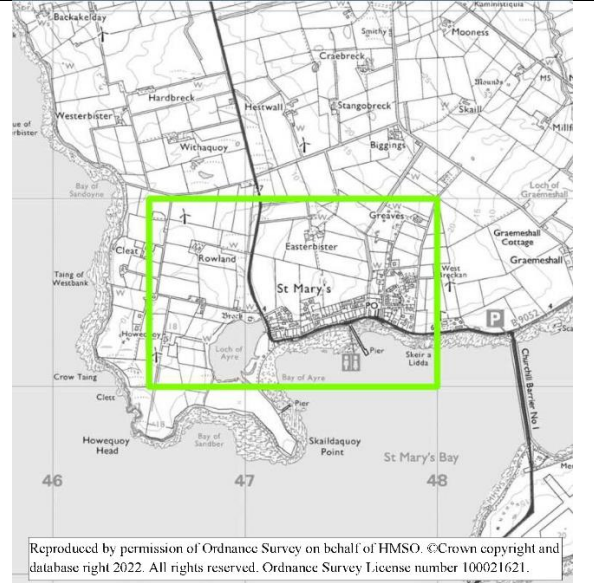
**Local Flood Risk Management plan datasheet**

**2.4.5.1 St Mary's (target area 373)**

**Summary**

St Mary's is located in the south of Mainland Orkney in the Orkney Islands Council area. The main source of flooding to St Mary's is coastal flooding and this village has endured numerous floods in the past. There are approximately 30 people and 20 homes and businesses currently at risk from flooding. This is likely to increase to 50 people and 30 homes and businesses by the 2080s due to climate change. Flood and erosion risk to the A961 is of particular concern, as this road is a vital link for communities.

**Location Map**



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**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. There is a history of regular flooding in St Mary's in recent years. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3731	Avoid inappropriate development that increases flood risk in St Mary's.
Prepare for flooding	3732	Prepare for current flood risk and future flooding in St Mary's as a result of climate change.
Reduce flood risk	3733	Reduce the risk of coastal flooding in St Mary's.

Action ID	St Mary's		37301
Action Type	Flood study		
Action Delivery Lead	Orkney Islands Council	Indicative Delivery	2023-2024
Description	Complete the Cycle 1 St Mary's Flood Study and identify actions to address A961 vulnerability near the post office. In particular, the effects of climate change on sea level, wave conditions, erosion and frequency of flooding or damage from wave action should be considered. The need for an adaptation plan to be assessed as part of a shoreline management plan for Orkney in Cycle 2.		
Funding	Funding allocated in October 2020.		

<b>Action ID</b>	<b>St Mary's</b>	<b>37301</b>
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>St Mary's</b>	<b>37302</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	<p>A shoreline management plan for Orkney is to be developed. The shoreline management plan to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years).</p> <p>For St Mary's it will be important to understand the impacts of increased flooding and erosion on road and other infrastructure connections between The linked south isles and the Orkney mainland.</p>	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>St Mary's</b>	<b>37303</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with the Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

<b>Action ID</b>	<b>St Mary's</b>	<b>37304</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning and engage with communities about the service when required.	

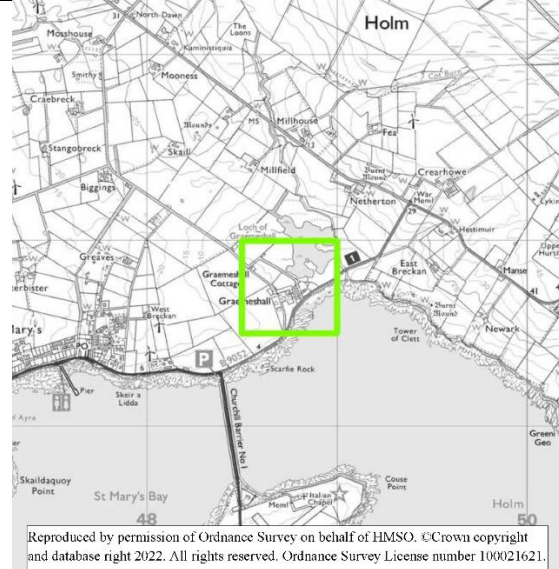
**Local Flood Risk Management plan datasheet**

**2.4.5.2 Graemeshall (target area 374)**

**Summary**

Graemeshall is a community in the south of Mainland Orkney. It is in the Orkney Islands Council area. The only significant source of flooding associated with Graemeshall is coastal flooding. There are less than 10 people, homes and businesses currently at risk of flooding, but this is a significant proportion of the community. This is likely to remain the same by the 2080s, but may occur more frequently due to sea level rise caused by climate change.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources, and this national assessment has highlighted the risk of coastal flooding (particularly associated with climate change) in this target area. Graemeshall has therefore been identified as a new target area for the 2021 flood risk management plans. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme and for surface water is improved by a sewer flood risk assessment. There is a history of regular flooding at Graemeshall, particularly in recent years. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3741	Avoid inappropriate development that increases flood risk at Graemeshall.
Improve data and understanding	3742	Improve data understanding of the risk of coastal flooding to the road at Graemeshall.
Prepare for flooding	3743	Prepare for current flood risk and future flooding in Graemeshall as a result of climate change.

<b>Action ID</b>	<b>Graemeshall</b>	<b>37401</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable	

<b>Action ID</b>	<b>Graemeshall</b>	<b>37401</b>
	approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). For Graemeshall It will be important to understand the impacts of increased flooding and erosion on road connections in the east mainland.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with the Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Graemeshall</b>	<b>37402</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA should maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

<b>Action ID</b>	<b>Graemeshall</b>	<b>37403</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

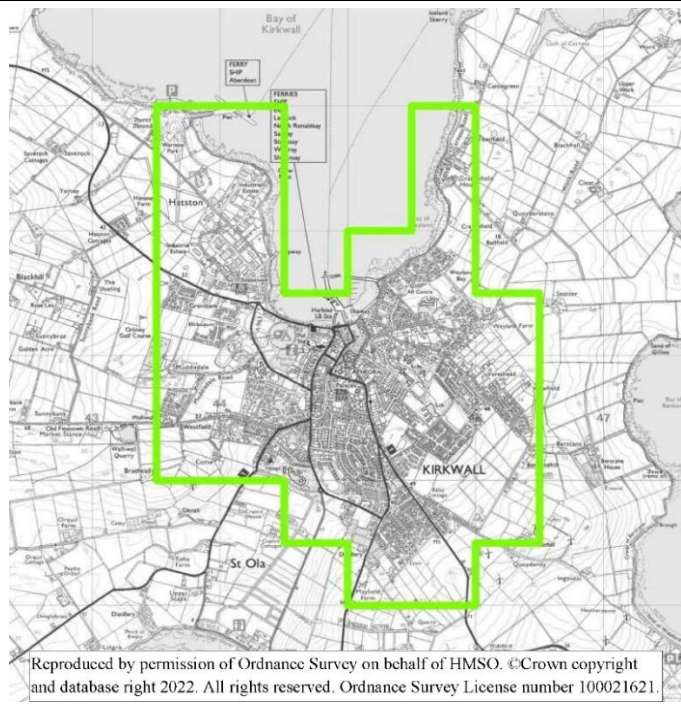
**Local Flood Risk Management plan datasheet**

**2.4.5.3 Kirkwall (target area 375)**

**Summary**

Kirkwall is the largest town in the Orkney Islands Council area. The main source of flood risk in Kirkwall is currently surface water flooding. There is also a risk of coastal flooding, which could increase due to climate change, but coastal flooding is managed by the new Kirkwall Harbour Flood Protection Scheme. There are approximately 1,300 people and 990 homes and businesses currently at risk from flooding. This could increase to 1,500 people and 1,100 homes and businesses by the 2080s due to climate change. These figures may be overestimated as the benefit of the Kirkwall Flood Scheme is not yet included in the strategic flood maps.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Kirkwall Harbour Flood Protection Scheme and the Orkney Coastal flood warning scheme. For surface water, understanding is improving through the surface water management plan and a sewer flood risk assessment. There are records of periodic coastal flooding prior to the completion of the flood protection scheme in 2018. There are numerous records of flooding from combined sewers, surface water drains and small watercourses including the notable flood in October 2006. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3751	Avoid an increase in flood risk by the appropriate management and maintenance of the Kirkwall Flood Protection Scheme.
Avoid flood risk	3752	Avoid inappropriate development that increases flood risk in Kirkwall.
Improve data and understanding	3753	Improve data and understanding of coastal flood risk in Kirkwall.
Prepare for flooding	3754	Prepare for current flood risk and future flooding in Kirkwall as a result of climate change.

Objective	ID	Description
Reduce flood risk	3755	Reduce the risk of flooding from surface water and small water courses in Kirkwall. Consider the impacts of tide locking of the Peedie Sea on drainage in Kirkwall.

<b>Action ID</b>	<b>Kirkwall</b> <b>37501</b>		
<b>Action Type</b>	<b>Flood defence maintenance</b>		
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b>	Ongoing
<b>Description</b>	The Kirkwall Harbour Flood Prevention Scheme needs to be maintained. Regular exercises should be carried out to deploy the flood gates, to ensure an efficient process is in place.		
<b>Funding</b>	OIC revenue - Roads Operations.		
<b>Coordination</b>	The action delivery lead is Orkney Islands Council who will coordinate with other Responsible Authorities as required.		

<b>Action ID</b>	<b>Kirkwall</b> <b>37502</b>		
<b>Action Type</b>	<b>Strategic mapping improvements</b>		
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b>	2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.		
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.		

<b>Action ID</b>	<b>Kirkwall</b> <b>37503</b>		
<b>Action Type</b>	<b>Sewer flood risk assessment</b>		
<b>Action Delivery Lead</b>	Scottish Water	<b>Indicative Delivery</b>	2025-2027
<b>Description</b>	Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Kirkwall sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk.		
<b>Funding</b>	Funding for this action is secured through Scottish Water's strategic planning commitments.		
<b>Coordination</b>	The action delivery lead is Scottish Water in coordination with Orkney Islands Council and SEPA.		

<b>Action ID</b>	<b>Kirkwall</b> <b>37504</b>		
<b>Action Type</b>	<b>Surface water management plan</b>		
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b>	2023-2024
<b>Description</b>	Orkney Islands Council to commission flood modelling to inform spatial planning and the completion of the Kirkwall Surface Water Management Plan. OIC to work closely with Scottish Water to implement the Surface Water Management Plan and identify		

<b>Action ID</b>	<b>Kirkwall</b>	<b>37504</b>
	opportunities for joint working. The impacts of climate change on flood risk should be considered. Opportunities to remove surface water from the sewerage system should be identified. The impacts of tide locking of the Peedie Sea need to be considered.	
<b>Funding</b>	Funding allocated in November 2019.	
<b>Coordination</b>	The action delivery lead is Orkney Islands Council with action to be coordinated with Scottish Water.	

<b>Action ID</b>	<b>Kirkwall</b>	<b>37505</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will maintain the Orkney coastal flood warning scheme. SEPA will continue to raise awareness of flood warning and engage with communities about the service when required.	

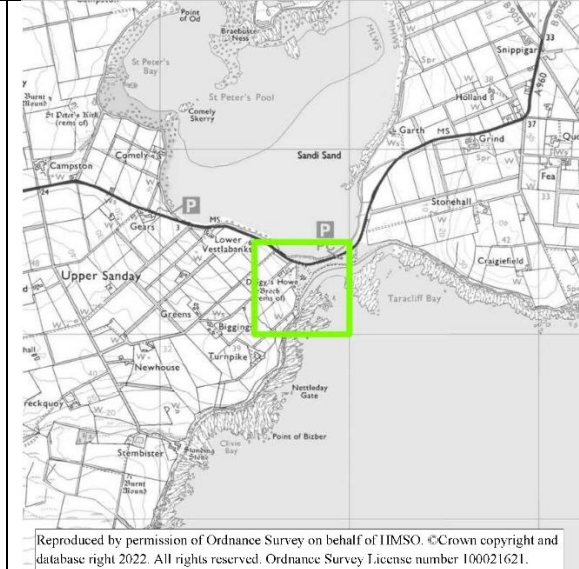
**Local Flood Risk Management plan datasheet**

**2.4.5.4 A960 Deerness (target area 456)**

**Summary**

The A960 is an important transport route connecting Deerness to Mainland in the Orkney Islands Council area. The road crosses a narrow isthmus with Taracliff Bay to the south and St Peter's Pool to the north. Here, parts of the road are at risk from erosion and coastal flooding. Coastal flooding from waves and erosion are likely to worsen due to sea level rise and increased storminess caused by climate change. When the road floods or erodes, Deerness is cut off from vital services.

**Location Map**



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**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment has identified coastal flood risk for the area and the risk is expected to increase due to climate change, as sea levels are expected to rise and winter storms become more frequent. Deerness has therefore been identified as a new target area for the 2021 flood risk management plans. There are limited records of flooding in Deerness but there is history of coastal erosion. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Improve data and understanding	4561	Improve data and understanding of the impacts of coastal flooding, erosion and climate change on the A960 to Deerness.
Prepare for flooding	4562	Prepare for current flood risk and future flooding as a result of climate change to the A960 causeway to Deerness.

<b>Action ID</b>	<b>A960 Deerness</b>	<b>45601</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term	



<b>Action ID</b>	<b>A960 Deerness</b>	<b>45601</b>
	(50 to 100 years). The impacts of coastal flood risk and erosion on the A960 causeway are to be assessed as part of the shoreline management plan. Monitoring and data collection activities may be included.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>A960 Deerness</b>	<b>45602</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

#### **2.4.6 02/03/06 Hoy and South Walls**

Hoy and South Walls is designated as a potentially vulnerable area due to coastal flooding to the Little Ayre and the Ayre. Coastal flood risk is likely to increase due to sea level rise caused by climate change. Coastal flooding has recently occurred in the area.

There are 2 target areas in this potentially vulnerable area, which have been the focus of further assessment, these are listed below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

Little Ayre (target area 377)

The Ayre (target area 441)

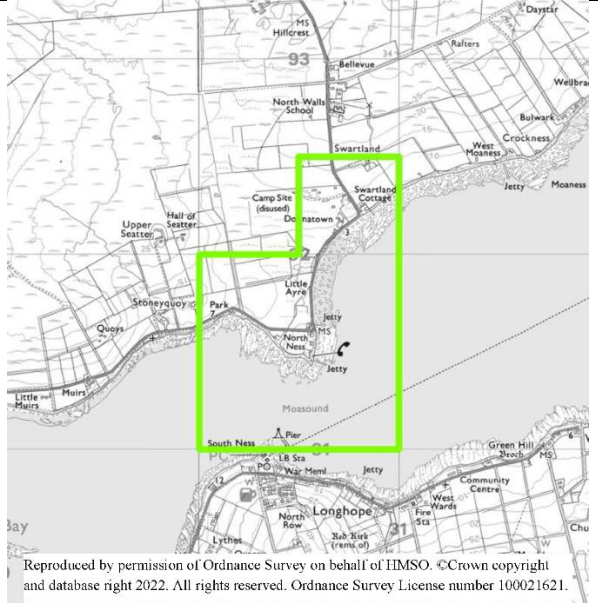
**Local Flood Risk Management plan datasheet**

**2.4.6.1 Little Ayre (target area 377)**

**Summary**

Little Ayre (The Ouse) is a section of low lying road with several nearby properties in the community of Walls at the southern end of Hoy in Orkney. The primary concern is coastal flooding of the B9047. The road links communities in Longhope and South Walls to the rest of the island the Ro-Ro ferry terminal at Lyness. If the B9047 floods, communities are cut off from vital services. Climate change may lead to the road being closed more often due to sea level rise and changes in storminess.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. The risk is expected to increase due to climate change, as sea levels are expected to rise and winter storms become more frequent. The Little Ayre has therefore been identified as a new target area for the 2021 flood risk management plans. There are records of the road flooding periodically from the sea. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Improve data and understanding	3771	Improve data and understanding of the risk of coastal flooding to the B9047 at Little Ayre resulting from climate change.
Prepare for flooding	3772	Prepare for current flood risk and future flooding in Little Ayre as a result of climate change.

<b>Action ID</b>	<b>Little Ayre 37701</b>		
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>		
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b>	2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short		

<b>Action ID</b>	<b>Little Ayre</b>	<b>37701</b>
	term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). The impacts to the transport links between Hoy and South Walls should be considered.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Little Ayre</b>	<b>37702</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

<b>Action ID</b>	<b>Little Ayre</b>	<b>37703</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA should maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

**Local Flood Risk Management plan datasheet**

**2.4.6.2 The Ayre (target area 441)**

**Summary**

The Ayre connects Hoy to South Walls in the Orkney Islands Council area. It carries the B9047 road link on a raised embankment. This is a vital link between communities providing access to essential services. The Ayre may be affected by flooding or damage from wave action more frequently due to sea level rise and increased storminess as a result of climate change.

**Location Map**



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**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme. There is a history of coastal flooding including damage done at the western end of the Ayre in December 2013. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Improve data and understanding	4411	Improve data and understanding of coastal flood risk for the Ayre resulting from climate change.
Prepare for flooding	4412	Prepare for current flood risk and future flooding to the Ayre as a result of climate change.

<b>Action ID</b>	<b>The Ayre</b>	<b>44101</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	1st cycle action to undertake a flood study for the Ayre to be superseded by a new action to develop a shoreline management plan for Orkney in cycle 2. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). Monitoring and data collection activities may be required.	

<b>Action ID</b>	<b>The Ayre</b>	<b>44101</b>
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>The Ayre</b>	<b>44102</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	Indicative Delivery Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

<b>Action ID</b>	<b>The Ayre</b>	<b>44103</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	Indicative Delivery 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

#### **2.4.7 02/03/07 South Ronaldsay**

South Ronaldsay is designated as a potentially vulnerable area due to the risk of coastal flooding to St. Margaret's Hope. Coastal flood risk is likely to increase due to sea level rise caused by climate change. Coastal flooding has recently occurred in the area.

There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

St Margaret's Hope (target area 382)

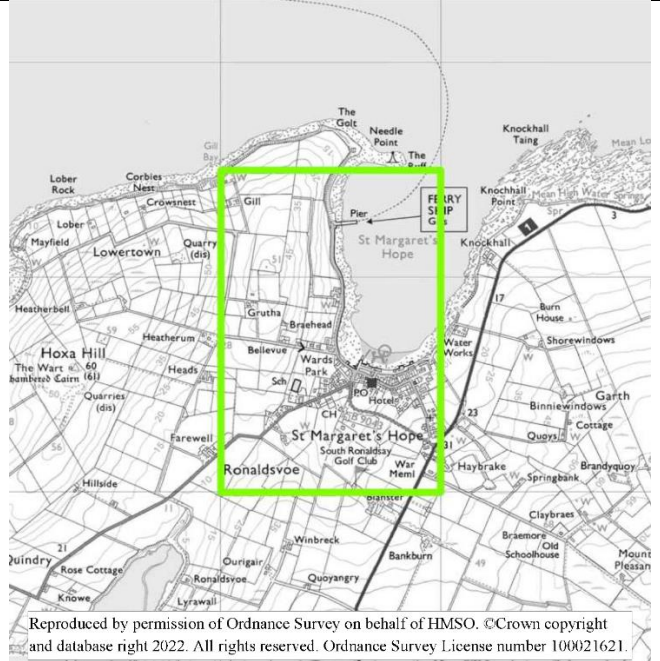
**Local Flood Risk Management plan datasheet**

**2.4.7.1 St Margaret's Hope (target area 382)**

**Summary**

St Margaret's Hope is on the northern coast of South Ronaldsay. It is in the Orkney Islands Council area. The main source of flooding in St Margaret's Hope is coastal flooding. There are approximately 40 people and 30 homes and businesses currently at risk from flooding. This is likely to increase to 60 people and 40 homes and businesses by the 2080s due to climate change. Overtopping of the Burn of Blanster south of Cromarty Square has led to surface water flooding to the square twice since 2009, including in November 2022 when internal flooding was reported to two commercial properties.

**Location Map**



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**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the St Margaret's Hope Flood Study (2019) and the development of the Orkney Coastal flood warning scheme. There is a history of regular coastal flooding in St Margaret's Hope. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3821	Avoid inappropriate development that increases flood risk in St Margaret's Hope.
Prepare for flooding	3822	Prepare for current flood risk and future flooding in St Margaret's Hope as a result of climate change.
Reduce flood risk	3823	Reduce the risk of coastal flooding in St Margaret's Hope.

Action ID	St Margaret's Hope		38201
Action Type	Flood study		
Action Delivery Lead	Orkney Islands Council	Indicative Delivery	2023-2024
Description	The flood study for St Margaret's Hope should be progressed to preferred option. A range of options should be considered. The impacts of climate change on flood risk should be fully considered. Coastal erosion may also need to be considered. Given the		



<b>Action ID</b>	<b>St Margaret's Hope</b>	<b>38201</b>
	anticipated significant impacts of sea level rise on flood risk, consideration of how flood risk management might need to develop over time and an adaptation plan is likely to be required.	
<b>Funding</b>	From existing staff budgets.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping and flood warning actions.	

<b>Action ID</b>	<b>St Margaret's Hope</b>	<b>38202</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

<b>Action ID</b>	<b>St Margaret's Hope</b>	<b>38203</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA should maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

#### **2.4.8 02/03/08 Burray and the Churchill Barriers**

This area is designated as a potentially vulnerable area due to the risk of coastal flooding to Burray Village and the Churchill Barriers. The Barriers form a vital link between Kirkwall and the communities in South Ronaldsay and the intermediate islands. Coastal flood risk is likely to increase due to sea level rise caused by climate change. The Churchill Barriers regularly have to be closed due to coastal flooding, including in January 2020 during Storm Brendan.

There are 2 target areas in this potentially vulnerable area, which have been the focus of further assessment, these are listed below. Further information on the objectives and actions to manage flood risk within this area is provided below.

##### **List of target areas**

Burray Village	(target area 385)
Churchill Barriers	(target area 446)

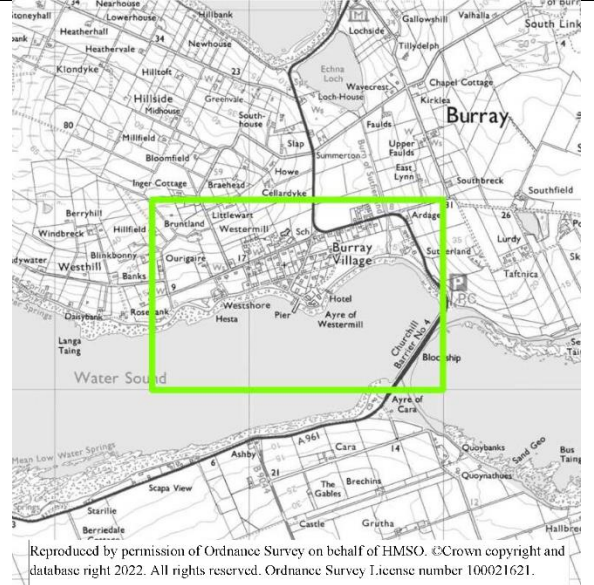
**Local Flood Risk Management plan datasheet**

**2.4.8.1 Burray Village (target area 385)**

**Summary**

Burray Village is on the southern coast of the island of Burray in the Orkney Islands Council area. The main source of flooding in Burray Village is coastal flooding. There are approximately 40 people and 30 homes and businesses currently at risk of flooding. This is likely to increase to 50 people and 40 homes and businesses by the 2080s due to climate change. Wave overtopping on Churchill Barrier number 4 can affect access to vital services for communities on South Ronaldsay and Burray.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for coastal flooding by the development of the Orkney Coastal flood warning scheme and the risk is expected to increase due to climate change, as sea levels are expected to rise and winter storms become more frequent. Burray has therefore been identified as a new target area for the 2021 flood risk management plans. There are records of coastal flooding in Burray including the notable flood in January 2005. The Dynamic Coast project has shown that parts of the shoreline in or adjacent to this target area are subject to erosion at present or are considered likely to erode in the future. Consideration should be given to how erosion might impact flood risk. Any actions taken should aim to support building natural resilience to flooding and not lead to an increase in erosion.

Objective	ID	Description
Avoid flood risk	3851	Avoid inappropriate development that increases flood risk in Burray Village.
Improve data and understanding	3852	Improve data and understanding of the risk of coastal flooding in Burray Village.
Prepare for flooding	3853	Prepare for current flood risk and future flooding as a result of climate change in Burray Village.

<b>Action ID</b>	<b>Burray Village</b>	<b>38501</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short	

<b>Action ID</b>	<b>Burray Village</b>	<b>38501</b>
	term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). The plan should consider the significance of Barrier No. 4 in the connectivity between South Ronaldsay and Mainland.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with the Orkney Islands Council on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Burray Village</b>	<b>38502</b>
<b>Action Type</b>	<b>Strategic mapping improvements</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	SEPA has undertaken improved coastal modelling in this target area including taking account of the impact of waves on coastal flooding. We will complete and publish the outcomes of this modelling work to inform decision making with respect to flooding at the coast.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate the flood map update with any other actions being carried out to understand or reduce coastal flooding.	

<b>Action ID</b>	<b>Burray Village</b>	<b>38503</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

<b>Action ID</b>	<b>Burray Village</b>	<b>38504</b>
<b>Action Type</b>	<b>Data collection</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> 2022-2028
<b>Description</b>	Installation of a long-term tide gauge to the east of Scapa Flow should be considered.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council to identify a suitable site for long term monitoring to be installed.	

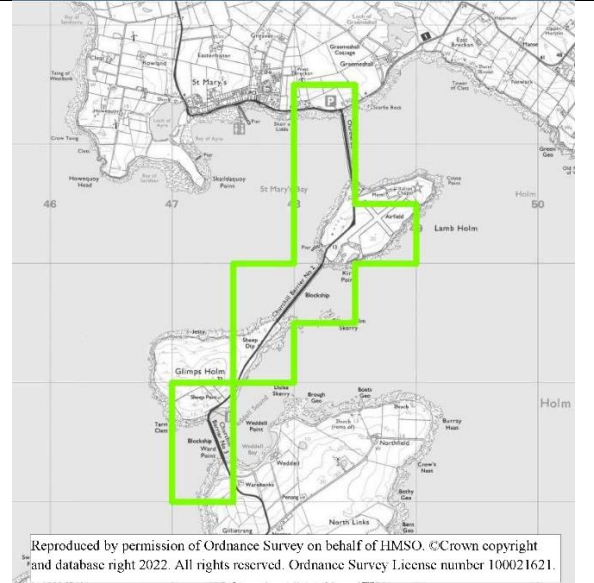
**Local Flood Risk Management plan datasheet**

**2.4.8.2 Churchill Barriers (target area 446)**

**Summary**

The Churchill Barriers are a series of road causeways in the Orkney Islands that connect the A961 to Mainland and the small islands of Lamb Holm, Glimps Holm and Burray. This is the only road from Mainland to the islands south of Mainland. The only source of flooding for the Churchill Barriers is from coastal flooding, specifically wave overtopping. Road infrastructure is the main receptor at flood risk. There is 1 business located on Lamb Holm that is also at risk of coastal flooding.

**Location Map**



**What is the current understanding of flood risk?**

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. Churchill Barriers has therefore been identified as a new target area for the 2021 flood risk management plans. The national level assessment is improved for coastal flooding by wave overtopping and tidal energy assessments (2015) and the development of the Orkney coastal flood warning scheme. There is a history of frequent flooding and hazardous conditions from wave overtopping.

Objective	ID	Description
Avoid flood risk	4461	Avoid inappropriate development that increases flood risk to the Churchill Barriers.
Prepare for flooding	4462	Prepare for current flood risk and future flooding to the Churchill Barriers as a result of climate change.
Prepare for flooding	4463	Develop an adaptive approach for the Churchill Barriers to future coastal flooding resulting from climate change.

Action ID	Churchill Barriers		44601
Action Type	Flood Study		
Action Delivery Lead	Orkney Islands Council	Indicative Delivery	2024-2025
Description	Completion of flood study on Churchill Barrier 2 to develop understanding of the impacts of climate change and sea level rise on the safe operation of the causeways carried by the Churchill Barriers. Further consideration of options to manage the expected increase in number of closures of the barriers and the need for an adaptation plan for the Churchill Barriers is required.		
Funding	Funding to be identified.		

<b>Action ID</b>	<b>Churchill Barriers</b>	<b>44601</b>
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to coordinate this action with flood warning action.	

<b>Action ID</b>	<b>Churchill Barriers</b>	<b>44602</b>
<b>Action Type</b>	<b>Shoreline management plan (coastal adaptive plan)</b>	
<b>Action Delivery Lead</b>	Orkney Islands Council	<b>Indicative Delivery</b> 2023-2024
<b>Description</b>	A shoreline management plan for Orkney is to be developed. The shoreline management plan is to set the strategic policy direction for coastal management and identify the most sustainable approaches for managing coastal flood and erosion risk in the short term (0 to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). For the Churchill Barriers it will be important to understand the impacts of increased flooding and erosion on road and other infrastructure connections between the linked south isles and the Orkney mainland. Monitoring and data collection activities may be required.	
<b>Funding</b>	LiDAR funded from Scottish Government coastal adaptation planning funding. Funding for the coastal adaption plan to be identified.	
<b>Coordination</b>	SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.	

<b>Action ID</b>	<b>Churchill Barriers</b>	<b>44603</b>
<b>Action Type</b>	<b>Flood warning maintenance</b>	
<b>Action Delivery Lead</b>	SEPA	<b>Indicative Delivery</b> Ongoing
<b>Description</b>	SEPA to maintain the Orkney coastal flood warning scheme.	
<b>Funding</b>	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.	
<b>Coordination</b>	SEPA will work with Orkney Islands Council on the potential to use information from the flood studies to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.	

## 3 Next Steps

### 3.1 Next Steps and Monitoring Progress

This Plan will run for six years from 2022. Over this period the Orkney Local Plan District Planning partnership will meet from time to time to monitor progress on implementing the actions detailed in Section two of the Plan. Each partner organisation will receive reports through its governance processes.

Between years two and three of the cycle (i.e. before December 2025), Orkney Islands Council, as lead local authority will publish a report on the conclusions of a review of the Plan, including information on the progress that has been made towards delivering the actions identified in the Plan.

Between years five and six of the cycle (i.e. before June 2028), Orkney Islands Council, as lead local authority will publish a report on the Plan containing an assessment of the progress made towards delivering the “current actions”, a summary of the actions not implemented, with reasons why, and a description of any other actions undertaken since the plan was finalised, which the lead local authority considers have contributed to the achievement of the objectives in the Plan.

Orkney Islands Council will make these reports available for public inspection.

## 4 Annexes

### 4.1 Land Use Planning

#### Flood risk management actions from national planning policies

##### AVOID DEVELOPMENT IN MEDIUM TO HIGH RISK AREAS

- 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.
- 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.
- 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.
- 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.

##### REDUCE IMPACTS TO EXISTING BUILDINGS

- 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.

##### PROTECT AND ENHANCE NATURAL FEATURES THAT HAVE A POSITIVE IMPACT ON REDUCING OVERALL FLOOD RISK

- 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.

##### NEW DEVELOPMENTS ARE DESIGNED TO ENSURE THAT SURFACE WATER DRAINAGE DOES NOT INCREASE FLOOD RISK ON OR OFF SITE

- a) **SEPA** prepares guidance for planning authorities and developers on the use of surface water hazard maps for land use planning purposes.
- 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.



### Flood risk management actions from national planning policies

- 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

### NEW DEVELOPMENT IS RESILIENT TO PREDICTED FUTURE CHANGES IN CLIMATE

- 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.

## 4.2 Acknowledgements

Orkney Islands Council gratefully acknowledges the cooperation and input that various parties have provided, including inter alia, the following organisations:

### SEPA

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### Local authorities

Lead authorities 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

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