

Flood Risk Management

(Scotland) Act 2009:

Local Flood Risk Management Plan

Tay Estuary and Montrose Basin

Cycle 2: 2022 - 2028



Published by: Angus Council

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

This is second local Flood Risk Management Plan for the Tay Estuary and Montrose Basin (TEAMB) Local Plan District, describing the actions which will make a real difference to managing the risk of flooding and recovering from any future flood events.

The task now for us – Local authorities, Scottish Water, SEPA, the Scottish Government and all other responsible authorities and public bodies – is to turn our local flood risk management plan into action

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Foreword

The impacts of flooding experienced by individuals, communities and businesses can be devastating and long lasting. It is vital that we continue to reduce the risk of any such future events and improve the area's ability to manage and recover from any events which do occur. The publication of this Plan is an important milestone in implementing the Flood Risk Management (Scotland) Act 2009 and improving how we cope with and manage floods in the Tay Estuary and Montrose Basin Local Plan District. The Plan translates this legislation into actions over the second planning cycle from 2022 to 2028 to reduce the risk of damage and distress caused by flooding. The Tay Estuary and Montrose Basin Local Plan District is led and is published by Aberdeenshire Council on behalf of a partnership comprising five local authorities: Angus Council, Aberdeenshire Council, Dundee City Council, Fife Council and Parth & Kinross Council Council, together with the following Responsible Authorities: Scottish Water; SEPA; Forestry and Land Scotland; and the Cairngorms National Park Authority.

This Plan presents actions to avoid and reduce the risk of flooding and prepare and protect ourselves and our communities within the Potentially Vulnerable Areas (PVAs) and across the Local Plan District (LPD). The delivery of many of these actions may be dependent on the availability of funding. However, we can all play our part in managing flood risk.

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding.

The publication of this Plan shows that the coordinated and collaborative efforts of public bodies can be brought together to deliver sustainable outcomes. However, the actions in this Plan can only be delivered with the support of all the public bodies, The Scottish Government, and most importantly you and your community.

This Plan, therefore, provides the blueprint upon which Local Authorities, SEPA, and Scottish Water and any other responsible authorities will deliver their flood risk management duties under the Flood Risk Management (Scotland) Act 2009.

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List of Acronyms and Abbreviations

CoSLA	Convention of Scottish Local Authorities
FRM	Flood Risk Management
FRMS	Flood Risk Management Strategies (prepared by SEPA)
ICS	Integrated Catchment Study
LA	Local Authority
LFRMP	Local Flood Risk Management Plan
LLA	Lead Local Authority
LPD	Local Plan District
NFM	Natural Flood Management
PFI	Public Finance Initiative
PVA	Potentially Vulnerable Area
OTA	Objective Target Area
Q&S	Quality & Standards (Scottish Water)
SEPA	Scottish Environment Protection Agency
SWMP	Surface Water Management Planning
TEAMB	Tay Estuary and Montrose Basin

1 Flood Risk Management in Tay Estuary and Montrose Basin

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 Plan) for the Tay Estuary and Montrose Basin 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 Plan sets out how and when actions to reduce the impact of flooding in the Tay Estuary and Montrose Basin (LPD 7) identified in the Suite of National Flood Risk Management Plans 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 Plan has been produced by Angus Council as the Lead Local Authority for this LPD, in agreement with the designated Responsible Authorities, that are listed below.

- Aberdeenshire Council,
- Dundee City Council,
- Fife Council,

- Perth and Kinross Council,
- Scottish Water,
- SEPA,
- Forestry and Land Scotland,
- Scottish Forestry, and
- Cairngorms National Park Authority.

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

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1.2 Managing flooding in Tay Estuary and Montrose Basin

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.

1.2.1 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 the Tay Estuary and Montrose Basin LPD.

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 Angus Council published the interim report for the Tay Estuary and Montrose Basin 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 in August 2023. These reports are

published here.

https://www.angus.gov.uk/the_environment/flooding_and_coastal_erosion/tay_estuary_and_montrose_basin_local_flood_risk_management_plan

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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 Angus 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

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) National parks

The National Park Authorities, Loch Lomond & Trossachs National Park and Cairngorms National Park, work with SEPA and other responsible authorities to develop the flood risk management plans and local flood risk management plans. They also fulfil a key role in land use planning, carrying out and permitting activities that can help manage and reduce flood risk.

e) 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.

Scottish Forestry and **Forestry and Land Scotland** took over the roles of Forestry Commission Scotland in 2018 when the Forestry and Land Management (Scotland)

Act 2018 came into force. While these executive agencies of Scottish Government are not formally designated as a responsible authority under the Flood Risk Management (Scotland) Act 2009, they support Scottish Government in delivering its flood risk related duties. This includes engaging in the development of the flood risk management plans through national and local advisory groups, Local Plan District partnerships, and collaborative projects. This reflects the widely held view that forestry can play a significant role in managing flooding.

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

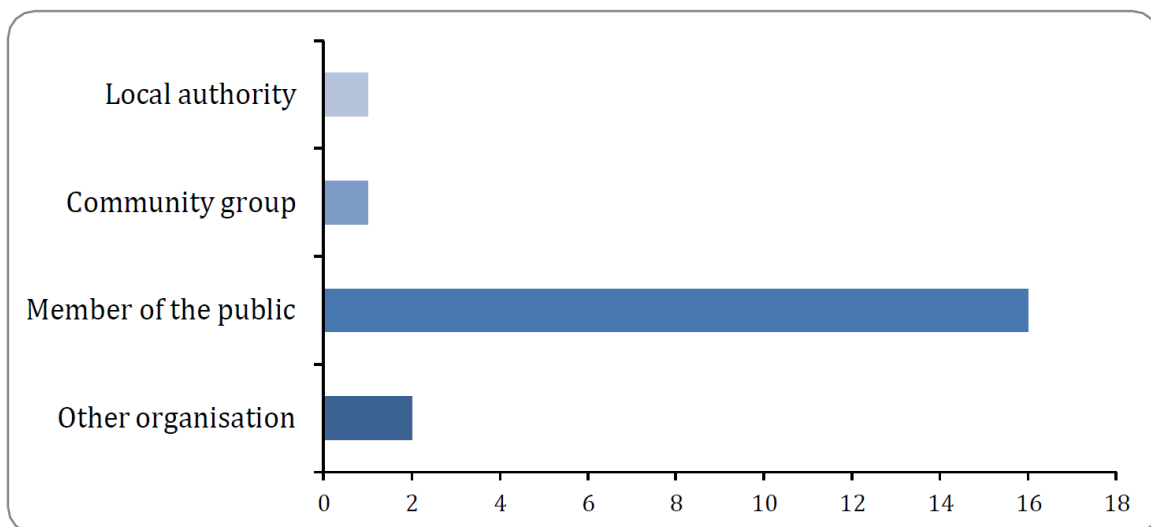
Further to the strong partnership approach to flood risk management planning in Scotland, it is essential to work with the people and communities that experience and live with the threat of flooding. This ensures that our assessment of the risk is accurate. How flooding is managed should support the 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 Tay Estuary and Montrose Basin LPD 7. The consultation was advertised widely by both Angus Council and SEPA. A summary of the consultation is provided in section 1.3.4.

A Habitats Regulations Appraisal (HRA) has been undertaken for the National Flood Risk Management Plan that has informed the Local Plans. 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 National Flood Risk Management Plan. Studies included in the 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.

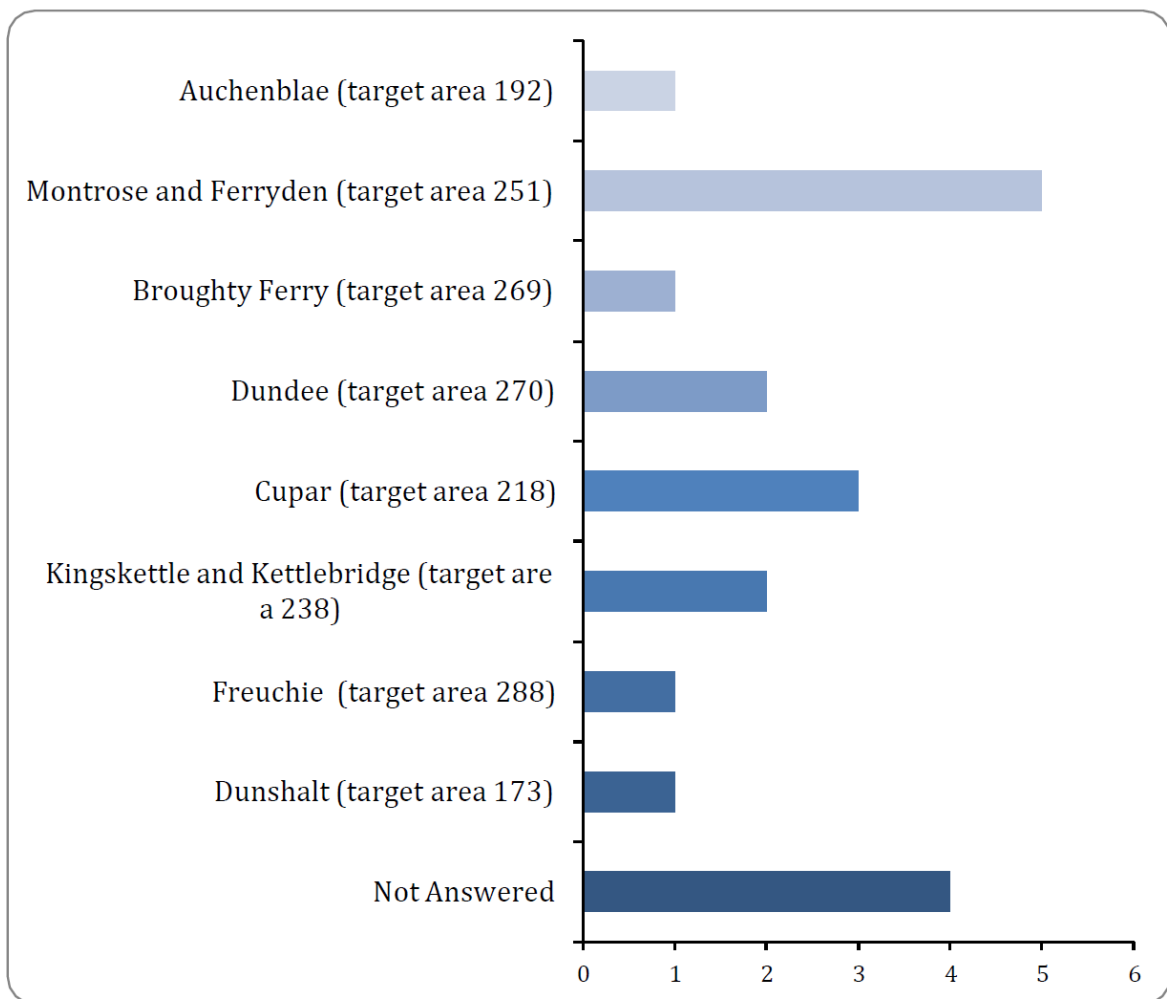
1.3.4 Consultation Report

A joint consultation was undertaken for both the National and Local Flood Risk Management Plans between 30 July and 31 October 2021. A total of 20 replies were received for the Tay Estuary and Montrose Basin area. The responses received were split across the following representatives:



Option	Total	Percent
Local authority	1	5.00%
Scottish Government	0	0.00%
Community body	0	0.00%

Local business	0	0.00%
Community group	1	5.00%
Member of the public	16	80.00%
Other organisation	2	10.00%
Not Answered	0	0.00%



The full results of the consultation were reported to Angus Council Communities Committee:

www.angus.gov.uk/sites/default/files/2022-02/Report%2051_22%20Flood%20Risk%20Management.pdf

https://www.angus.gov.uk/sites/default/files/2022-02/Report%2051_22%20Flood%20Risk%20Management_App1.pdf

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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 with 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 4.2.

At a strategic level, most of the Tay Estuary and Montrose Basin Catchment is covered by the "TAYplan Strategic Development Plan 2016-2036" except for Aberdeenshire Council's area which is covered by the "Aberdeen City and Shire Strategic Development Plan 2020" and also the Cairngorm National Park Authority's (CNPA) area which is covered by the Cairngorms National Park Local Development Plan.

TAYplan Strategic Development Plan 2016-2036 sets out a vision to 2036, as well as policies and land requirements and provides the strategic context for the preparation of the Local Development Plans for Angus, Dundee, Perth and Kinross, and North Fife. The Strategic Development Plan is required to be reviewed every five years.

Angus Council develops and adopts a new Local Development Plan every ten years and is reviewed at five yearly intervals to ensure that an up-to-date plan is in place at all times and to ensure consistency with the Strategic Development Plan. It sets out

the Council's strategy for delivering appropriate development in Angus, considering a number of potential constraints, including flooding. The current plan was adopted in September 2016.

Periodically Aberdeenshire Council, Cairngorms National Park Authority Dundee City Council, Fife Council, and Perth and Kinross Council will review and update their Local Development Plans. These plans set out the strategy for delivering appropriate development within each area and take into account a number of constraints, including flooding.

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. Angus council, Aberdeenshire Council, Cairngorms National Park Authority, Dundee City Council, Fife Council, and Perth and Kinross Council all produce their emergency plans to 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 clearance and repair works

The duty to assess bodies of water and schedule clearance and repair works lies with Angus Council, Aberdeenshire Council, Dundee City Council, Fife Council, and Perth and Kinross Council. Each council has a risk-based approach to assessing bodies of water that may give rise to flooding. Where potential flood risk has been identified the relevant water body has been included in the Council's routine

inspection schedule. The frequency of inspection is dependent on the assessed risk, any works identified during these inspections are included in each council's schedule of clearance and repair, which are available for public inspection on request.

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1.5 Next steps and monitoring progress

Angus 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 group¹. 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 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.

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2 Flood Risk Management in Tay Estuary and Montrose Basin

2.1 Local Flood Risk Management Plans 2022 – 2028

The Tay Estuary and Montrose Basin Local Plan District covers around 2,700km² and has a population of approximately 340,000 people. It covers part of the Cairngorms National Park and the low-lying coastal areas to the north and south of the Firth of Tay. The Local Plan District includes a 230km stretch of coastline from Inverbervie to St Andrews, incorporating the Firth of Tay. It includes the urban areas of Arbroath, Brechin, Broughty Ferry, Dundee, Montrose and St Andrews.

There are urban and agricultural areas to the south, with forest, grassland and heather in the mountains to the north. There are a number of lochs and reservoirs in the area including the Loch of Forfar, Rescobie Loch, Monikie Reservoir and Crombie Reservoir. There are several major rivers, including the River North Esk, River South Esk and River Eden.

There is river, coastal and surface water flood risk. A number of large floods have affected this Local Plan District. Storms Frank and Desmond in December 2015 led to river flooding causing widespread damage throughout the area, made worse by further storms in January 2016.

Currently it is estimated that there are around 21,000 people and 14,000 homes and businesses at risk from flooding. This may increase to 29,000 people and 19,000 homes and businesses by the 2080s due to climate change. The expected annual cost of flooding over a long period of time is around £12.6 million.

Local flood risk management planning is led by **Angus Council**, other responsible authorities include Aberdeenshire Council, Dundee City Council, Fife Council, Perth and Kinross Council, Cairngorms National Park Authority, SEPA, and 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 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 Local Plan District 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.

	Awareness raising
Action	<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 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>
Funding	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p> <p>Awareness raising activities will be funded from local authority revenue budgets</p>
Co-ordination	<p>Delivery of actions to raise awareness will be coordinated by the responsible authorities through the Local Plan District Partnership.</p> <p>SEPA and the Responsible Authorities will use any studies, projects and flood schemes to engage with communities and raise awareness of flood risk. Communications activity will be coordinated through existing arrangements within Local Plan District Partnerships. Information will be disseminated through website, social media and other community engagement activity. SEPA and responsible authorities will coordinate awareness raising activities with other related actions.</p>
Timing	2022-2028

	Data to support climate resilience
Action	<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>
Funding	SEPA’s role in this action is funded by Scottish Government through SEPA’s grant in aid settlement.
Co-ordination	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.
Timing	2022-2028

	Emergency plans
Action	<p>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.</p>

Funding	<p>Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.</p> <p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p>
Co-ordination	<p>Councils have developed a Generic Emergency Plan and a Flooding Emergency Response Plans. These Plans are designed to ensure that contingency measures are in place for the co-ordinated and flexible response to flooding incidents to mitigate the effects of flooding emergencies.</p> <p>SEPA flood alerts and warnings will be monitored, and resources made ready as required. A co-ordinated response will follow any reports of flooding.</p> <p>Emergency response is coordinated with regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. A debrief and plan review will be carried out following any flood events.</p> <p>Protecting property from flooding is the responsibility of the owner of the property. Councils can sometimes provide sandbags to properties, but only where there is an imminent risk of flooding and resources allow.</p> <p>Emergency plans/response activities will be coordinated with related actions.</p>
Timing	2022-2028

	Flood forecasting
Action	<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</p>

	when required, giving people a better chance of reducing the impact of flooding on their home or business.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA work in partnership with the Met Office and will work closely with all other authorities involved in emergency response to flooding.
Timing	2022-2028

	Flood warning development framework
Action	<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. This is available here: https://www.sepa.org.uk/media/594489/sepa-flood-warning-dev-framework-2022-28.pdf.</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 our 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> <p>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.</p>

Co-ordination	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.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Timescale	2022 - 2028

Future flood risk management planning	
Action	<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 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.</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>We will plan for a better future by publishing our flooding services strategy in 2023 with a clear and measurable delivery plan. We will put greener, fairer communities at the heart of our 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>
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.

Co-ordination	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.
Timing	Ongoing / 2022-2028 Flooding services strategy 2023 Next Flood Risk Management Plans 2027

Guidance development	
Action	<p>The Scottish Government and SEPA will develop and update 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 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>This is available here: <u>Designing and managing forests and woodlands to reduce flood risk - Forest Research</u></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>
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	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.

Timing	<p>Draft flood studies guidance (SEPA) 2023</p> <p>Options appraisal & Adaptation guidance (SG & SEPA) 2023</p> <p>Other guidance & updates 2023-2028</p>
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Hazard mapping updates	
Action	<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: https://www.sepa.org.uk/environment/water/flooding/flood-maps/.</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>
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	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.
Timing	2022-2028

Land use planning	
Action	<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. Current national planning policies aim to restrict development within the floodplain and limit exposure of new receptors to flood risk, promote flood reduction via natural and structural flood management measures and restoration of natural features, and avoid increased surface water flooding through sustainable</p>

	<p>drainage and the minimisation of impermeable surfaces. Locally determined planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.</p>
Funding	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p>
Co-ordination	<p>SEPA delivery statutory advice on flooding on both planning applications and Local Development Plans and will continue to work with the other responsible authorities to support the land use planning process.</p> <p>Councils and the National Parks Authorities, as local planning authorities, will coordinate its work with the strategic development planning authorities as appropriate.</p> <p>The Councils will work with regional planning authorities to incorporate national policy on flood risk management. Furthermore, Councils will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans. Councils will adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk. Councils will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.</p>
Timing	<p>2022-2028</p>

	<p>Maintenance</p>
Action	<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. 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>
<p>Funding</p>	<p>The assessment of watercourses, clearance and repair works and maintenance of all council assets are subject to funding from the relevant Local Authority's revenue budget.</p> <p>Scottish Water is funded by customer charges as set by their economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
<p>Co-ordination</p>	<p>Sections 17 and 18 of the Flood Risk Management (Scotland) Act 2009 require local authorities to prepare maps of relevant bodies of water and sustainable urban drainage systems (SUDS), assess flood risk from those bodies of water from time to time and to prepare a schedule of clearance and repair works where such works would substantially reduce flood risk. Under Section 59 of the same Act, Local authorities also have a duty to carry out clearance and repair works described on the schedule.</p> <p>Local Authorities' schedules of clearance and repair works are made available for public inspection. Councils carry out routine, scheduled inspections of watercourses at a frequency which depends on flood risk. Further reactive inspections are carried out when issues are highlighted or during times of flooding.</p> <p>Further bodies of water will be included where it has been identified that they may give rise to a risk of flooding.</p> <p>Any identified clearance and repair works from these inspections are logged in a database/spreadsheet and are undertaken in order of priority, subject to available funding.</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. In the first instance, clearance and repair works are therefore referred to the landowner, where they can be identified. Local Authorities usually only carry out works where there has been a failure of the landowner to act, where landownership is not clear, or where urgent intervention is required.</p> <p>In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or works.</p>

	<p>Scottish Water undertake risk-based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large-scale capital maintenance work to identify opportunities for co-ordination.</p> <p>If any removal of trees is proposed, this may require permission from Scottish Forestry. Removal without permission could be a breach of the Forestry Act and also Cross Compliance.</p> <p>Local Authorities will liaise with SEPA where controlled activities may be required and with private landowners where they may require to take access on private land or to notify landowners that they require to undertake maintenance.</p> <p>The Council will coordinate maintenance activities with related actions.</p>
Timing	2022-2028

Natural flood management mapping	
Action	<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>
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA will work with key stakeholders to review and update the opportunities mapping.
Timing	2025

National flood risk assessment	
Action	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.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA will work with others as the NFRA is updated, including to keep other responsible authorities informed through the Local Plan District Partnerships.
Timing	December 2024

National surface water mapping	
Action	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.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA is currently working with a contractor to develop the modelling needed to deliver the flood maps. As the mapping is developed, local authorities and Scottish Water will continue to be engaged in opportunities to verify, shape and understand the new mapping products.
Timing	2024

Reservoirs	
Action	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.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA will work with others as required, to fulfil their regulatory duties and to develop flood warning capabilities. Others will include reservoir managers and operators, and Civil Contingencies Act responders who share duties for emergency response.
Timing	Ongoing/ 2022-2028 Flood warning developments 2022-2024

	Scottish Flood Defence Asset Database
Action	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.
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Co-ordination	SEPA will work with the local authorities to ensure accurate data on existing and new schemes is made available for the Scottish Flood Defence Asset Database.
Timing	2022-2028

	Self help
Action	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

	<p>properties and businesses are insured against flood damage. The following places offer help with taking steps to protect yourself:</p> <p>https://www.floodre.co.uk/</p> <p>https://www.biba.org.uk/current-issues/flood-insurance/</p> <p>https://floodlinescotland.org.uk/</p> <p>https://scottishfloodforum.org/</p> <p>https://ready.scot/</p> <p>Responsible authorities and SEPA will continue to develop the understanding of flood risk to communities and promote measures to help individuals and businesses to reduce their risk.</p>
Funding	<p>Individuals have prime responsibility for protecting themselves and their property from flooding and are therefore expected to meet the costs of protecting themselves.</p> <p>SEPA’s role in this action is funded by Scottish Government through SEPA’s grant in aid settlement.</p>
Co-ordination	<p>SEPA and Responsible Authorities have a duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable from is the first step in the process.</p> <p>SEPA and Responsible Authorities will continue to actively promote Floodline; provide communities with advice to help them prepare for flooding and to install property flood products; and will support community resilience groups to developing their emergency plans.</p> <p>Work by SEPA and the responsible authorities to develop understanding and help communities reduce their risk will be coordinated through the Local Plan District Partnership.</p>
Timing	2022-2028

More locally 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 15 Potentially Vulnerable Areas (PVAs) in this Local Plan District. The following sections provide more information on these areas.

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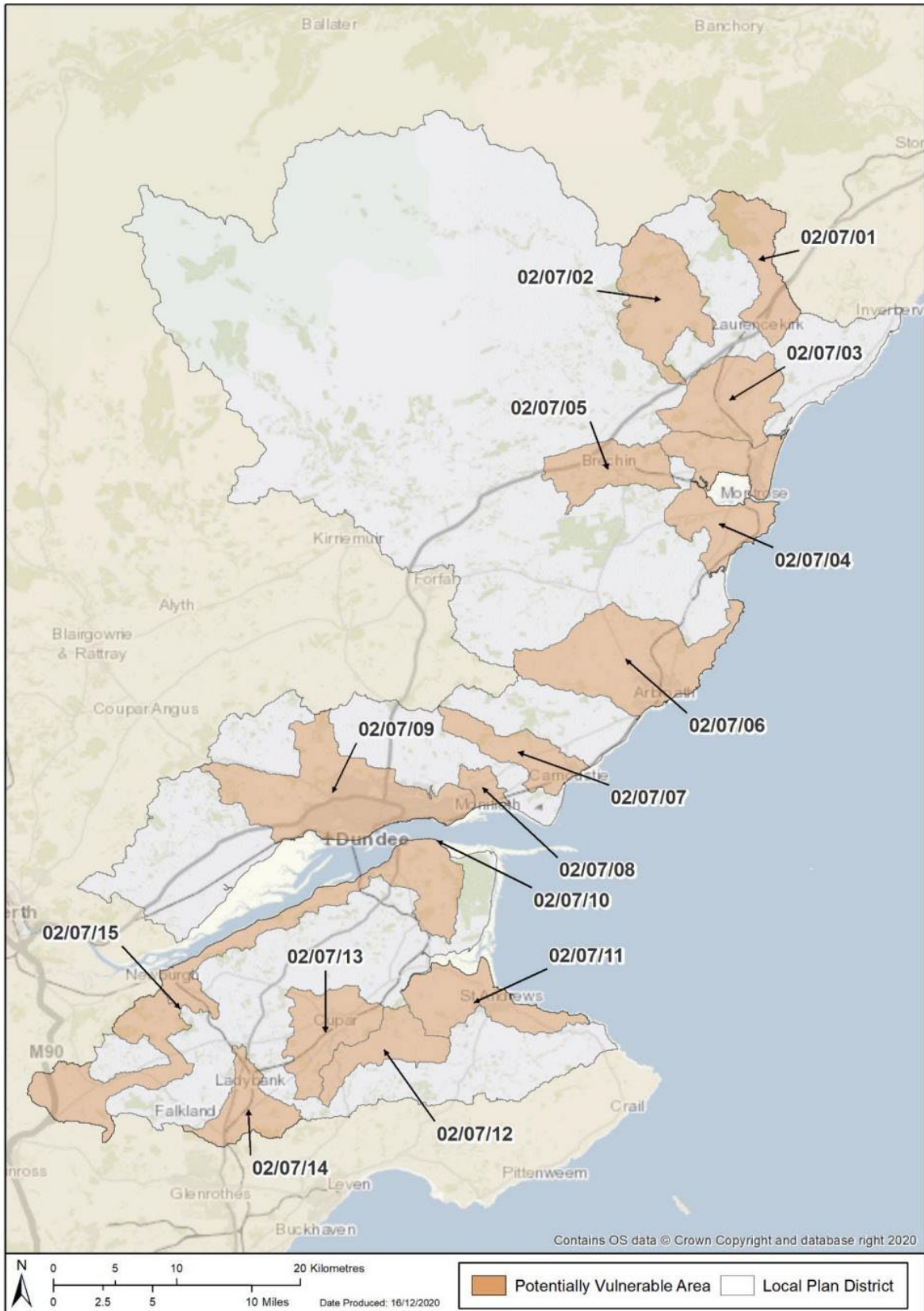


Figure 1. Potentially vulnerable areas in Tay Estuary And Montrose Basin

2.4 LPD 7 Tay Estuary And Montrose Basin – List of PVAs

Click the [blue text](#) to select your area of interest

PVA Ref	PVA Name	Local authority area
02/07/01	Auchenblae	Aberdeenshire
02/07/02	Fettercairn	Aberdeenshire
02/07/03	Marykirk	Aberdeenshire
02/07/04	Montrose Basin	Angus
02/07/05	Brechtin	Angus
02/07/06	Arbroath	Angus
02/07/07	Carnoustie, Barry	Angus
02/07/08	Monifieth	Angus
02/07/09	Dundee, Broughty Ferry and Invergowrie	Dundee City, Perth and Kinross
02/07/10	Newburgh	Fife
02/07/11	St Andrews	Fife
02/07/12	Pitscottie	Fife
02/07/13	Cupar and Springfield	Fife
02/07/14	Kingskettle and Kettlebridge	Fife
02/07/15	Auchtermuchty	Fife

PVA 02/07/01 (Auchenblae)

This area is designated as a potentially vulnerable area due to potential river and surface water flood risk to Auchenblae. There is a history of flooding in the area, with recent river flooding causing damage to a property in Auchenblae.

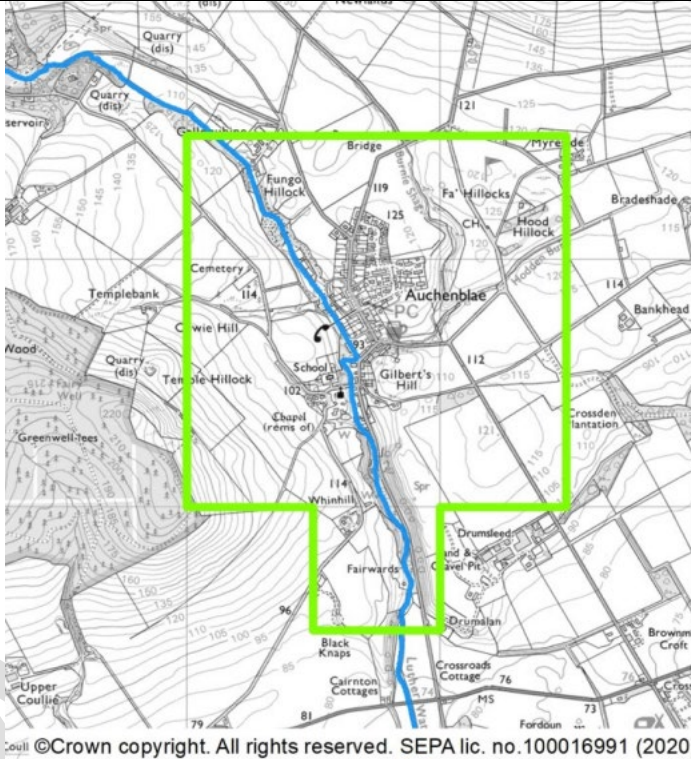
There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

List of target areas

Auchenblae (target area 192)

DRAFT

Auchenblae (target area 192)

Summary	Location Map
<p>The village of Auchenblae is located north of Laurencekirk and within the Aberdeenshire Council area. The main source of flooding in Auchenblae is river flooding from the Luther Water. There are approximately 50 people and 30 homes and businesses at risk from flooding. This is unlikely to change significantly due to climate change.</p>	 <p>© Crown copyright. All rights reserved. SEPA lic. no. 100016991 (2020) (© Crown copyright and database rights 2022 OS 100023404)</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, and this national assessment has highlighted the risk of flooding in this target area. There are limited records of flooding in the Auchenblae target area.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
1921	Avoid flood risk	Avoid inappropriate development that increases flood risk in Auchenblae
1922	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Auchenblae

Target Area	Auchenblae	Action ID	19201
Action Type	Flood risk management review		
Delivery Lead	SEPA	Indicative Delivery	2022-2028
Description	<p>During each 6-year planning cycle, we update our understanding of flooding to include all new data and information that has become available. This includes information on any flooding that has happened and the latest predictions on the impacts of climate change. The updated understanding is used to set any appropriate objectives and actions for areas at risk of flooding.</p> <p>No local actions specific to this target area have been identified yet. There are national actions planned that will cover this area, including an update to SEPA's surface water flood maps and an update to the national flood risk assessment. These, along with other actions that are carried out across the whole local plan district covering this area, will help to manage flood risk in the long term. The need for actions for this area will be reviewed again in 2026.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>The action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the other responsible authorities to review flood risk management for this area, through the Local Plan District Partnerships. A public consultation on priority areas will be held in 2024 by SEPA, which will be open for three months. A public consultation on future flood management actions will be held in December 2026 and will be open for at least three months.</p>		

PVA 02/07/02 (Fettercairn)

This area is designated as a potentially vulnerable area due to river and surface water flood risk to Fettercairn. Recent flooding from the Cauldcotts Burn and the Crichtie Burn have resulted in property flooding.

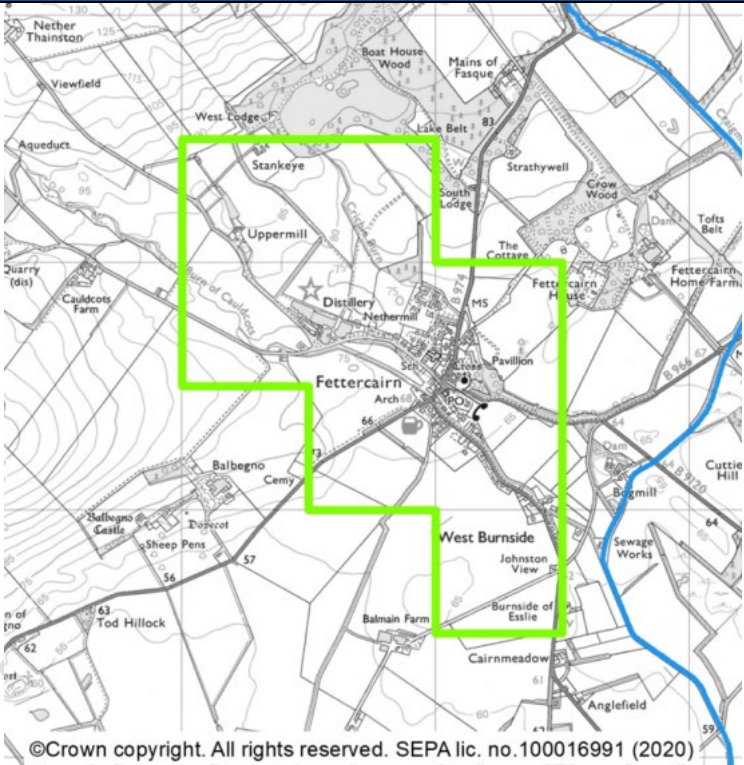
There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

List of target areas

Fettercairn (target area 272)

DRAFT

Fettercairn (target area 272)

Summary	Location Map
<p>Fettercairn is located northwest of Laurencekirk, within the Aberdeenshire Council area. The main source of flooding in Fettercairn is river flooding. There are approximately 190 people and 110 homes and businesses currently at risk from flooding, which is a significant proportion of the community. This is likely to remain the same by the 2080s due to climate change.</p>	 <p>(© Crown copyright and database rights 2022 OS 100023404)</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 underpinned for flood risk from the Burn of Cauldcots by the development of the Fettercairn Flood Protection Scheme (1982) and flood storage area (2011). Understanding is also improved by the development and operation of a community flood warning scheme. There is a history of periodic flooding from the Cauldcots Burn with notable flooding in October 2009. Flooding also resulted in December 2012 when the Cauldcots Burn overtopped its defences.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

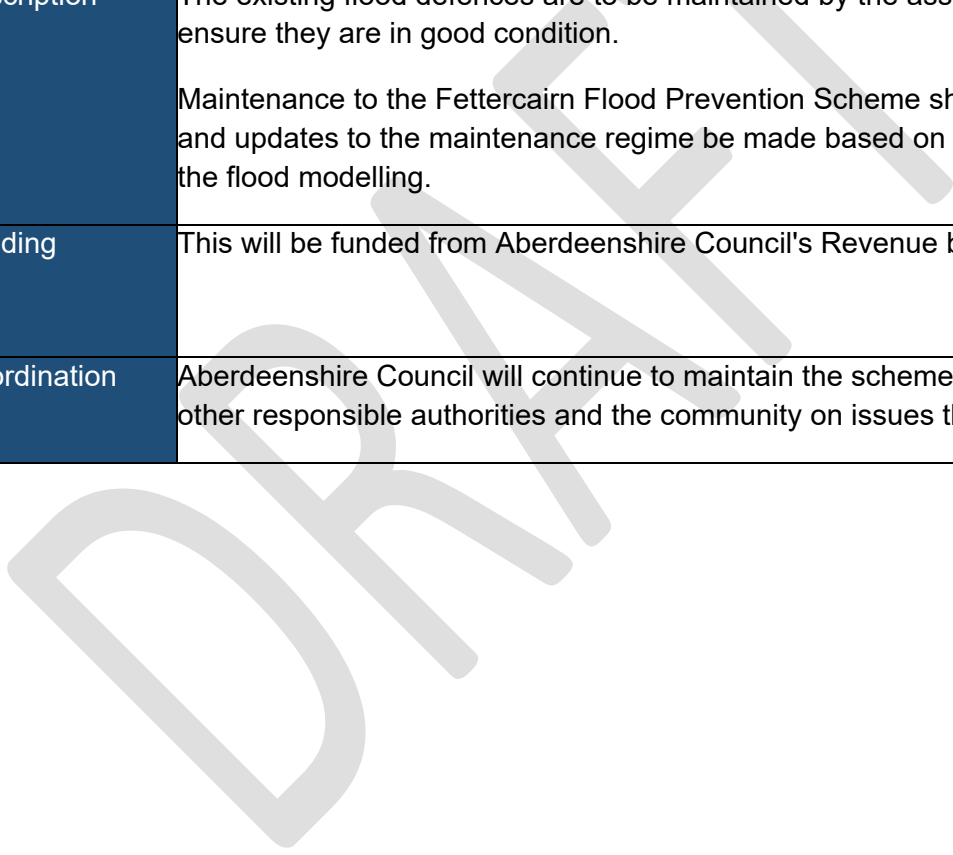
SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2721	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Fettercairn Flood Prevention scheme
2722	Avoid flood risk	Avoid inappropriate development that increases flood risk in Fettercairn
2723	Improve data and understanding	Improve data and understanding of flooding from Burn of Cauldcotts and its tributaries in Fettercairn as well as the performance of the Fettercairn Flood Prevention Scheme
2724	Prepare for flooding	Prepare for current flood risk a future flooding as a result of climate change in Fettercairn

Target Area	Fettercairn	Action ID	27201
Action Type	Flood study		
Delivery Lead	Aberdeenshire Council	Indicative Delivery	2023-2025
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk. In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>The performance and condition of the existing flood defences are to be evaluated, including consideration of the likely impacts of climate change. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Better understanding of flooding issues from the Burn of Cauldcotts and its tributaries is needed. The performance of the Fettercairn Flood Prevention Scheme is also to be reviewed, because there is new information on rainfall patterns, new modelling techniques and an improved understanding of the impacts of climate change on flood risk. This may include data collection and monitoring to improve the confidence in the performance of the flood prevention scheme. Post flood event surveys may also be required.</p>		
Funding	<p>Funding for the study will be subject to Scottish Government's block grant and capital support,</p> <p>and budget allocations over the six years of the Plan, 2022-2028.</p>		

Coordination	<p>The action delivery lead is Aberdeenshire Council and require coordination with other responsibilities (including SEPA and Scottish Water) and will also include community engagement.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>
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Target Area	Fettercairn	Action ID	27202
Action Type	Flood defence maintenance		
Delivery Lead	Aberdeenshire Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance to the Fettercairn Flood Prevention Scheme should continue and updates to the maintenance regime be made based on the findings of the flood modelling.</p>		
Funding	This will be funded from Aberdeenshire Council's Revenue budget.		
Coordination	Aberdeenshire Council will continue to maintain the scheme liaising with other responsible authorities and the community on issues that may arise		



PVA 02/07/03 (Marykirk)

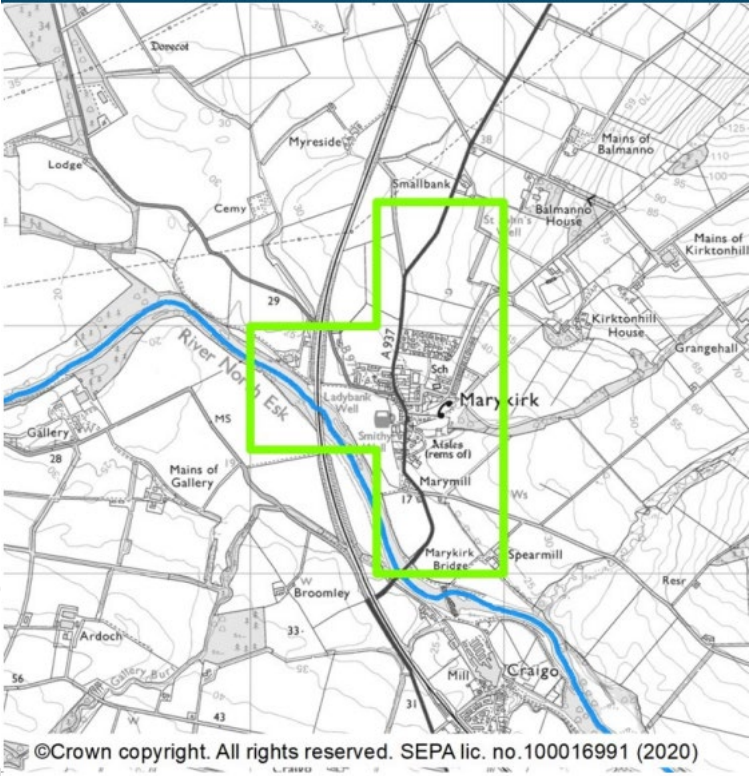
This area is designated as a potentially vulnerable area due to river flood risk to Marykirk from the North Esk and its tributaries. Marykirk has a history of frequent and deep flooding from the River North Esk and the Balmaleedy Burn. There is 1 target area in this potentially vulnerable area, which 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

Marykirk (target area 174)

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Marykirk (target area 174)

Summary	Location Map
<p>Marykirk is located on the River North Esk in the Aberdeenshire Council area. The significant source of flooding in Marykirk is river flooding and from the Burn of Balmaleedy. A key concern for this community is deep flooding on the bridge over the Burn of Balmaleedy, which can lead to vehicles getting trapped in floodwater.</p>	 <p>© Crown copyright. All rights reserved. SEPA lic. no.100016991 (2020)</p> <p>(© Crown copyright and database rights 2022 OS 100023404)</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 flood risk from the Burn of Balmaleedy based on the flood works to reduce flood risk from the burn. However, risk is thought to be underestimated within the flood maps, based on past records of flooding. Understanding of river flood risk is also improved by the development and operation of the North Esk flood warning scheme. There are frequent records of river flooding in Marykirk, including notable flooding in January 2016 when the North Esk flooded.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
1741	Avoid flood risk	Avoid inappropriate development that increases flood risk in Marykirk
1742	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Marykirk

Target Area	Marykirk	Action ID	17401
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Ongoing
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the River North Esk flood warning scheme.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>The action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will maintain the River North Esk flood warning scheme. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

PVA 02/07/04 (Montrose Basin)

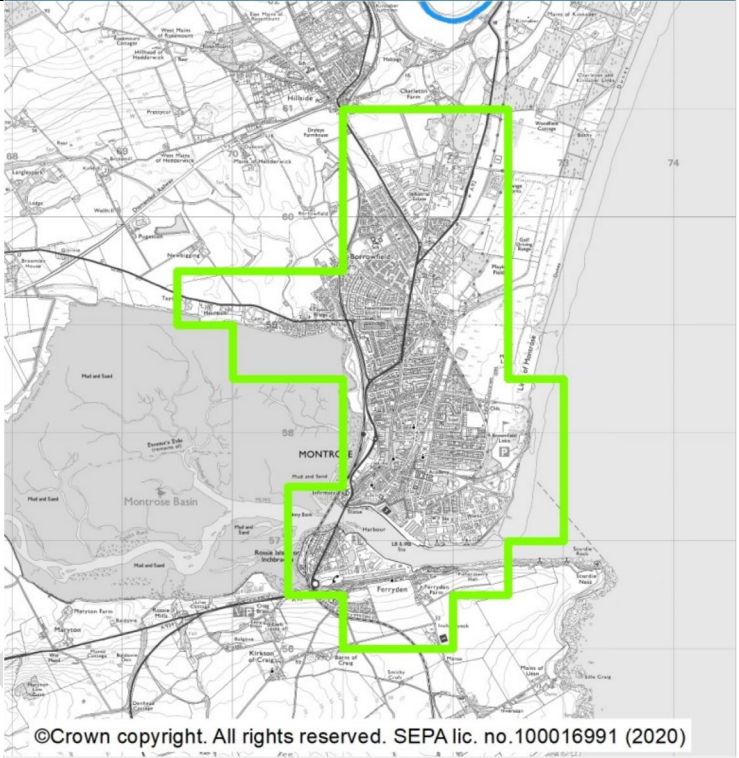
This area is designated as a potentially vulnerable area due to flood risk to Montrose and Ferryden. The main sources of flooding are coastal from the North Sea and surface water. Coastal erosion contributes to the existing flooding issues. Recent coastal flooding occurred in Ferryden due to high tides combined with high river levels in the South Esk. Surface water flooding of roads has occurred several times in recent years in Montrose, with property flooding also occurring. 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

Montrose and Ferryden (target area 251)

DRAFT

Montrose and Ferryden (target area 251)

Summary	Location Map
<p>Montrose and Ferryden are located on the east coast of Scotland, within the Angus Council area. The main sources of flooding within the Montrose and Ferryden area are coastal and surface water flooding. There are approximately 1,300 people and 780 homes and businesses currently at risk from flooding. This is likely to increase to approximately 2,900 people and 1,700 homes and businesses by the 2080s due to climate change.</p>	 <p>©Crown copyright. All rights reserved. SEPA lic. no.100016991 (2020)</p> <p>(© Crown copyright and database rights 2022 OS 100023404)</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 assessment has been improved by flood studies undertaken by Angus Council and Scottish Water. There is a history of flooding and coastal erosion in this area.

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.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2511	Avoid flood risk	Avoid inappropriate development that increases flood risk in Montrose and Ferryden
2512	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of existing coastal defences around Montrose basin
2513	Improve data and understanding	Improve data and understanding of existing coastal defences in Montrose
2514	Improve data and understanding	Improve data and understanding of coastal flooding and coastal erosion in Montrose
2515	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Montrose and Ferryden
2516	Reduce flood risk	Reduce the risk of surface water flooding in Montrose
2517	Reduce flood risk	Reduce the risk of coastal flooding and coastal erosion in Montrose

Target Area	Montrose and Ferryden	Action ID	25101
Action Type	Flood scheme or works design		
Delivery Lead	Angus Council	Indicative Delivery	Proposed 2022-2028 and 2028-2034 (subject to funding)
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Subject to Scottish Government funding and the outcome of national prioritisation of flood protection schemes, Angus Council may progress with promotion of a formal coastal flood protection scheme at Montrose Bay. There may be availability of Scottish Government funding for coastal erosion management.</p> <p>Two studies have been undertaken recently for Montrose. A general study of flood risk was completed in 2019 which provided recommendations for the coastal management of flood risk. The pan government study by Dynamic Coast identified the criticality of the dunes at Montrose Beach in providing flood protection at the location. Angus Council will continue to develop sustainable coastal management actions to reduce flood risk at</p>		

	<p>the location caused by the tidal impact on the eroding natural feature in cycle 2/3. This will involve a collaborative approach with all partners.</p> <p>In accordance with the Flood Risk Management Plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Montrose Basin Special Protection Area and the River South Esk Special Area of Conservation.</p>
Funding	The delivery of the scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme).
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, other responsible authorities, relevant landowners and the public.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping and flood warning actions.</p>

Target Area	Montrose and Ferryden	Action ID	25102
Action Type	Catchment/coastal management implementation		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>Improvements to catchment or coastal management are to be implemented following agreement of the design, costs and timescales.</p> <p>The Montrose Coastal Flood Study also outlined that a short-term option of dune propagation could be used to maintain the integrity of the dunes for approximately 10 years. The short term option is currently under detailed design and aims to provide protection against erosion and flooding to the Montrose golf course. These works should be considered as part of adaptation planning.</p>		
Funding	The delivery of the improvements to the catchment or coastal management will be subject to Angus Council's revenue budget or other funding being made available.		
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, relevant landowners and the public.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.</p>		

Target Area	Montrose and Ferryden	Action ID	25103
Action Type	Adaptation plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>An adaptation master plan will be developed to cover the Angus Council area. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed. Any existing strategic initiatives will provide opportunities for adaptive actions to be implemented.</p>		
Funding	The adaptation plan will be subject to funding from Angus Council's revenue budget.		
Coordination	Action delivery lead is Angus Council and coordinated with the surface water management plan and the shoreline management plan.		

Target Area	Montrose and Ferryden	Action ID	25105
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Ongoing
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Aberdeenshire and Angus coastal flood warning scheme.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to use information from the flood schemes and studies along the north east coast to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Target Area	Montrose and Ferryden	Action ID	25106
Action Type	Strategic mapping improvements		
Delivery Lead	SEPA	Indicative Delivery	2023-2026
Description	<p>SEPA will continue to update flood maps based on new information.</p> <p>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.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>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.</p>		

Target Area	Montrose and Ferryden	Action ID	25104
Action Type	Surface water management plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2034
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or overwhelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.</p> <p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Montrose and Ferryden.</p> <p>The surface water management plan identifies areas most at risk from surface water flooding in Montrose and Ferryden and identifies options that could alleviate flood risk.</p> <p>The sewer flood risk assessment undertaken by Scottish Water will continue as planned to address complex surface water and sewer flood risk and interaction with small/culverted watercourses.</p>		

	As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed.
Funding	The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme). Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.
Coordination	Action delivery lead is Angus Council in coordination with Scottish Water and other responsible authorities.

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PVA 02/07/05 (Brechin)

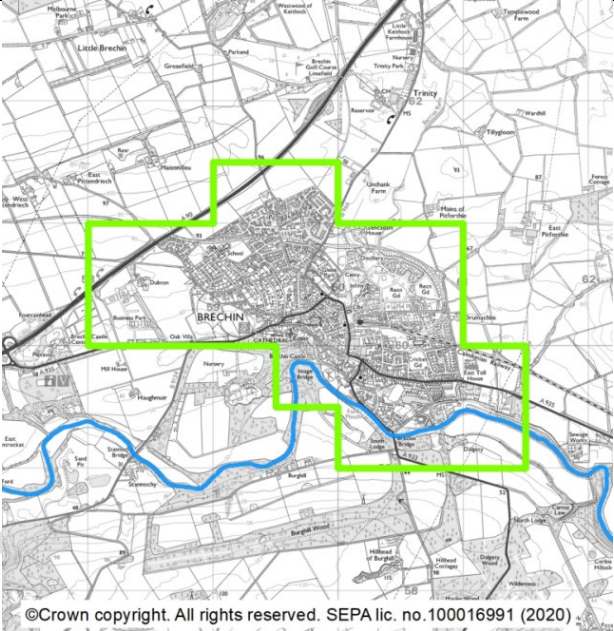
This area is designated as a potentially vulnerable area due to flood risk to Brechin. The main source of flooding is surface water. Flooding from the River South Esk has been significantly reduced as a result of Brechin Flood Protection Scheme which was completed in 2018. There is a long history of flooding in Brechin prior to the flood scheme being built. 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

Brechin (target area 203)

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Brechin (target area 203)

Summary	Location Map
<p>Brechin is a town located just west of Montrose and within the Angus Council area. The main source of flooding in Brechin is from surface water, however there is also a risk from river flooding. A flood protection scheme has recently been completed that protects homes and businesses from river flooding. There are approximately 420 people and 290 homes and businesses at risk from flooding. This is likely to increase to 650 people and 440 homes and businesses by the 2080s due to climate change.</p>	 <p>(© Crown copyright and database rights 2022 OS 100023404)</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 assessment has been improved by flood studies undertaken by Angus Council and Scottish Water including those prepared for development of the Brechin Flood Protection Scheme. There is a history of flooding from the River South Esk in Brechin, with the last flood recorded in 2014. The construction of the flood protection scheme has reduced flood risk from the River South Esk.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2031	Avoid flood risk	Avoid inappropriate development that increases flood risk in Brechin
2032	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Brechin Flood Protection Scheme
2033	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Brechin
2034	Reduce flood risk	Reduce the risk of river flooding from the River South Esk by working with natural processes in the wider catchment
2035	Reduce flood risk	Reduce the risk of surface water flooding in Brechin

Target Area	Brechin	Action ID	20307
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Ongoing
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the South Esk flood warning scheme.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will maintain the South Esk flood warning scheme. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Target Area	Brechin	Action ID	20301
Action Type	Catchment/coastal management implementation		
Delivery Lead	Angus Council	Indicative Delivery	2022 -2028
Description	Improvements to catchment or coastal management are to be implemented following agreement of the design, costs and timescales.		

	A natural flood management study will be undertaken to identify opportunities for natural flood management in the South Esk Catchment. Natural flood management actions continue to be implemented across the catchment.
Funding	The delivery of the improvements to the catchment or coastal management will be subject to funding from Angus Council's revenue budget or other funding being made available.
Coordination	<p>Action delivery lead is Angus Council and co-ordinated with the River South Esk Catchment Partnership and the adaptation plan.</p> <p>Coordination is being undertaken through the River South Esk Catchment Partnership with SEPA, Tay District Salmon Fisheries Board, Nature Scotland, Cairngorm National Park Authority (CNPA), relevant landowners and the public.</p>

Target Area	Brechin	Action ID	20302
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2024-2026
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Brechin sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Brechin sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009</p>		
Funding	Funding for this action is secured within Scottish Water's business plan		
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>		

Target Area	Brechin	Action ID	20303
Action Type	Surface water management plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2034
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or overwhelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Brechin as a priority area.</p> <p>The surface water management plan identifies areas most at risk from surface water flooding in Brechin and identifies options that could alleviate this risk.</p> <p>The sewer flood risk assessment undertaken by Scottish Water will be reviewed for opportunities to address complex surface water and sewer flood risk and interaction with small/culverted watercourses.</p> <p>As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed.</p>		
Funding	<p>The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme). Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.</p>		
Coordination	<p>Action delivery lead is Angus Council in coordination with Scottish Water and other responsible authorities.</p>		

Target Area	Brechin	Action ID	20304
Action Type	Adaptation plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>An adaptation master plan will be developed to cover the Angus Council area. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed. Any existing strategic initiatives will provide opportunities for adaptive actions to be implemented.</p>		
Funding	The adaptation plan will be subject to funding from Angus Council's revenue budget.		
Coordination	Action delivery lead is Angus Council and coordinated with the surface water management plan, catchment management plan and community engagement.		

Target Area	Brechin	Action ID	20305
Action Type	Community engagement		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>The community will have opportunities to get involved with the development of the adaptation plan and any flood related projects and initiatives being developed for Brechin.</p>		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		

Coordination	<p>Action delivery lead is Angus Council and coordinated with the adaptation plan.</p> <p>Angus Council will liaise with local community groups, the Community Council, residents and land/property owners where appropriate.</p>
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Target Area	Brechin	Action ID	20306
Action Type	Flood defence maintenance		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Angus Council will develop a formal maintenance programme for the scheme.</p> <p>As built drawings will be made available to SEPA for consideration in the Scottish Flood Defence Asset database, flood maps and flood warning scheme updates.</p>		
Funding	<p>The maintenance of the Flood Protection Scheme will be subject to funding from Angus Council's revenue budget.</p>		
Coordination	<p>Angus Council maintain the existing flood protection scheme as required. Once the formal maintenance programme is complete, Angus Council will undertake inspections and maintenance in accordance with the recommendations set out in the scheme maintenance manuals.</p> <p>Maintenance works will be coordinated with SEPA, NatureScot, landowners and other stakeholders as required. SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>		

PVA 02/07/06 (Arbroath)

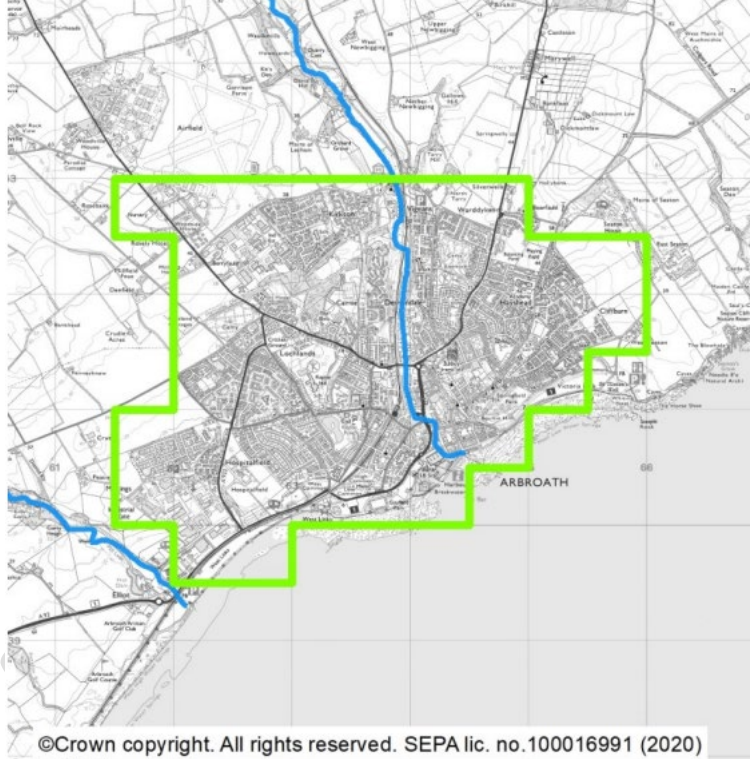
This area is designated as a potentially vulnerable area due to the risk of river, coastal and surface water flooding to Arbroath. There is a history of flooding in the area, with recent flooding of roads from surface water and road and property flooding. Coastal wave overtopping has occurred at Arbroath Harbour. 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

Arbroath (target area 190)

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Arbroath (target area 190)

Summary	Location Map
<p>Arbroath lies on the North Sea coast within the Angus Council area. This target area also includes the small village of St Vigean. The main source of flooding in the area is surface water, however there is also a risk of flooding from river and the coast. There are around 2,200 people and 1,500 homes and businesses at risk from flooding. This is likely to increase to 2,800 people and 1,800 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 Arbroath area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. This national assessment has been improved by flood studies undertaken by Angus Council and Scottish Water including those prepared for development of the Arbroath (Brothock Water) Flood Protection Scheme. There is a history of flooding from various sources in this area. Once completed, the flood protection scheme on the Brothock Water will reduce the risk of flooding from this source.

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.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
1901	Avoid flood risk	Avoid inappropriate development that increases flood risk in Arbroath
1902	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Brothock Water Flood Protection Scheme
1903	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Arbroath
1904	Reduce flood risk	Reduce the risk of surface water flooding in Arbroath
1905	Reduce flood risk	Reduce the risk of coastal flooding in Arbroath

Target Area	Arbroath	Action ID	19001
Action Type	Flood scheme or works implementation		
Delivery Lead	Angus Council	Indicative Delivery	2023
Description	<p>The flood scheme/works is to be built following agreement of the design, costs and timescales.</p> <p>The construction of the Arbroath (Brothock Water) Flood Protection Scheme was completed in December 2022. When completed, as built drawings will be made available to SEPA, for consideration in the Scottish Flood Defence Asset Database, flood map updates and flood warning scheme updates.</p>		
Funding	<p>The Arbroath Flood Protection Scheme will be subject to on-going available capital funding (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme).</p>		

Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, other responsible authorities, relevant landowners and the public.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD and flood warning actions. SEPA will also work with partners to coordinate flooding actions with the Brothock Water WEF project.</p>
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Target Area	Arbroath	Action ID	19002
Action Type	Flood defence maintenance		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Angus Council will develop a formal maintenance programme for the flood protection scheme following construction. This will take the form of planned and reactive maintenance. As built drawings will be made available to SEPA for consideration in the Scottish Flood Defence Asset Database, flood maps and flood warning scheme updates.</p>		
Funding	<p>The maintenance of the Flood Protection Scheme will be subject to funding from Angus Council's revenue budget.</p>		
Coordination	<p>Angus Council maintain the existing flood protection scheme as required. Once the new scheme is complete, Angus Council will undertake inspections and maintenance in accordance with the recommendations set out in the scheme maintenance manuals.</p> <p>Maintenance works will be coordinated with SEPA, NatureScot, landowners and other stakeholders as required. SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD and with the Brothock Water WEF project.</p>		

Target Area	Arbroath	Action ID	19003
Action Type	Flood study (options appraisal)		
Delivery Lead	Scottish Water and Angus Council	Indicative Delivery	2022-2034
Description	<p>In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Arbroath Flood Study is a joint study to identify potential options between Scottish Water and Angus Council to reduce surface water and sewer flooding. It is part of the integrated catchment modelling optioneering in conjunction with Scottish Water.</p> <p>The joint ICS Optioneering study (completed in Cycle 1) identified opportunities to reduce surface water and sewer flood risk in a number of specific locations within Arbroath. The options were not identified to be cost-beneficial to be taken forwards in isolation, however the delivery of these opportunities were recommended to be aligned with existing Angus Council flood protection and active travel projects where possible. Scottish Water and Angus Council will work collaboratively to identify where opportunities may be delivered and work together to secure funding to take these forwards. Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.</p>		
Funding	<p>Funding for this action is not secured. Delivery of opportunities is dependant on securing funding from partners and external bodies.</p> <p>Angus Council's role in this action will be subject to Angus Council's revenue budget or other funding being made available.</p>		
Coordination	<p>Action delivery leads are Scottish Water and Angus Council and coordination will be undertaken with other responsible authorities.</p> <p>Scottish Water will co-ordinate with Angus Council to support the potential for opportunities to reduce surface water and sewer flood risk to be delivered as part of ongoing and future Angus Council projects</p>		

Target Area	Arbroath	Action ID	19004
Action Type	Surface water management plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2034
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Arbroath as a priority area.</p>		
Funding	<p>The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme). Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.</p>		
Coordination	<p>Action delivery lead is Angus Council in coordination with Scottish Water and other responsible authorities.</p>		

Target Area	Arbroath	Action ID	19005
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2025
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Hatton sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009</p>		

Funding	Funding for this action is secured within Scottish Water's business plan
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>

Target Area	Arbroath	Action ID	19006
Action Type	Flood study		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>A coastal flood study has been recommended for this area to further investigate coastal flooding issues in Arbroath. The study should include flood modelling and scoping of flood risk management options. The flood study should consider all relevant sources of flooding and assess the potential for natural flood management measures. The study should consider current and future flood risk and the potential impacts of climate change and inform the development of an adaptation plan.</p>		
Funding	The delivery of the study will be subject to funding from Angus Council's revenue budget or other funding being made available.		
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with other responsible authorities.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping and flood warning actions.</p>		

Target Area	Arbroath	Action ID	19007
Action Type	Adaptation plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>An adaptation master plan will be developed to cover the Angus Council area. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long-term flood risk management approach will be developed. Existing strategic initiatives such as the active travel plan in Arbroath will provide opportunities for adaptive actions to be implemented.</p>		
Funding	The adaptation plan will be subject to funding from Angus Council's revenue budget.		
Coordination	Action delivery lead is Angus Council and coordinated with the surface water management plan and the shoreline management plan.		

Target Area	Arbroath	Action ID	19008
Action Type	Shoreline management plan (coastal adaptive plan)		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>The existing assessment of coastal flood and erosion risk is to be reviewed and updated as required. The plan should include assessment of climate change and develop adaptive approaches to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A Shoreline Management Plan covers this area. This should be reviewed as part of the adaptation plan taking into account best available knowledge on climate change predictions.</p>		
Funding	The review will be subject to funding from Angus Council's revenue budget.		
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with the adaptation plan and other responsible authorities.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.</p>		

Target Area	Arbroath	Action ID	19009
Action Type	Community engagement		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>The community will have opportunities to get involved with the development of the adaptation plan and any flood related projects and initiatives being developed for Arbroath.</p>		
Funding	<p>Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>		
Coordination	<p>Action delivery lead is Angus Council and coordinated with the adaptation plan.</p> <p>Angus Council will liaise with local community groups, the Community Council, residents and land/property owners where appropriate.</p>		

Target Area	Arbroath	Action ID	19010
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Ongoing
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Brothock Water flood warning scheme.</p>		
Funding	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with Angus Council on the potential to use information from the flood studies and scheme to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>
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Target Area	Arbroath	Action ID	19011
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Target Area	Arbroath	Action ID	19012
Action Type	Strategic mapping improvements		
Delivery Lead	SEPA	Indicative Delivery	2023-2026
Description	<p>SEPA will continue to update flood maps based on new information.</p> <p>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.</p>		

Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>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.</p>

Target Area	Arbroath	Action ID	19013
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Ongoing
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should investigate improvements to the Brothock Water flood warning scheme.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with Angus Council on the potential to use information from the flood studies and scheme to inform ongoing flood warning. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

PVA 02/07/07 (Carnoustie, Barry)

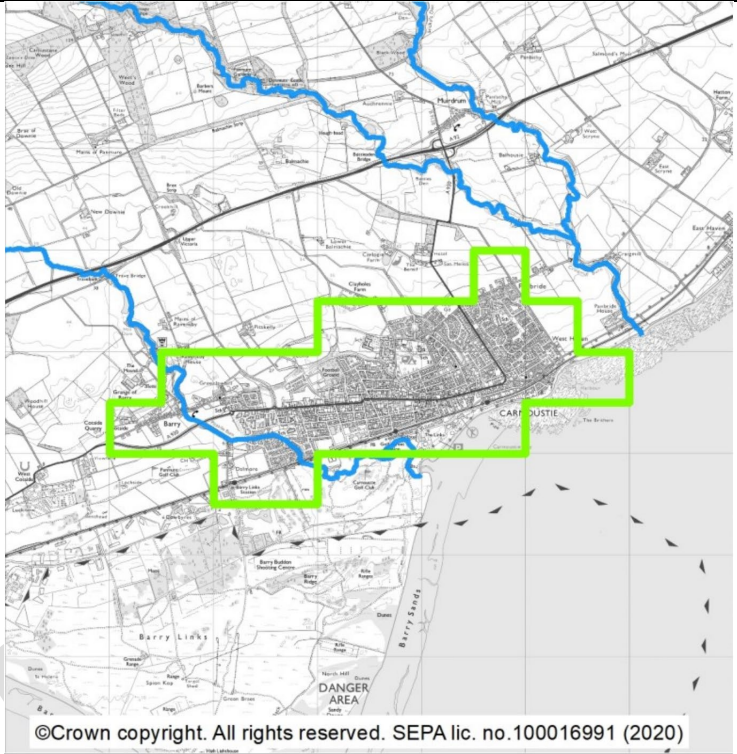
This area is designated as a potentially vulnerable area due to flood risk to Carnoustie and Barry from river, coastal and surface water flooding. There is a history of flooding in this area. Recent flooding has occurred due to a combination of high tides, high river levels in the Barry Burn and surface water flooding. Flooding of roads due to surface water has also 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

Carnoustie (target area 210)

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Carnoustie (target Area 210)

Summary	Location Map
<p>Carnoustie is located on the east coast of Scotland between Dundee and Arbroath in the Angus Council area. The main sources of flooding in Carnoustie are river and surface water flooding, however there is also a risk of coastal flooding. The local authority has carried out a flood study in this area which estimated that there are approximately 290 homes and businesses at risk from river flooding.</p>	 <p>©Crown copyright. All rights reserved. SEPA lic. no.100016991 (2020)</p> <p>(© Crown copyright and database rights 2022 OS 100023404)</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 has been improved by flood studies undertaken by Angus Council and Scottish Water. There have been localised incidents of flooding in the area, most recently in August 2019.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2101	Avoid flood risk	Avoid inappropriate development that increases flood risk in Carnoustie and Barry
2102	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the existing Barry Burn river and coastal flood defences (revetment) in Carnoustie
2103	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Carnoustie and Barry
2104	Reduce flood risk	Reduce the risk of river flooding from the Barry Burn in Carnoustie and Barry
2105	Reduce flood risk	Reduce the risk of surface water flooding in Carnoustie and Barry

Target Area	Carnoustie	Action ID	21002
Action Type	Flood defence maintenance		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Angus Council will continue to maintain the flood defences on the Barry Burn and the coastal revetment until the new flood protection scheme is operational.</p>		
Funding	The maintenance of the Flood Protection Scheme will be subject to funding from Angus Council's revenue budget.		
Coordination	<p>Angus Council maintain the existing flood protection scheme and undertake inspections and maintenance as required.</p> <p>Maintenance works will be coordinated with SEPA, NatureScot, landowners and other stakeholders as required.</p>		

Target Area	Carnoustie	Action ID	21003
Action Type	Adaptation plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028

Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>An adaptation master plan will be developed to cover the Angus Council area. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed. Any existing strategic initiatives will provide opportunities for adaptive actions to be implemented.</p>
Funding	The adaptation plan will be subject to funding from Angus Council's revenue budget.
Coordination	Action delivery lead is Angus Council and coordination will be required with the surface water management plan, natural flood management and community engagement actions.

Target Area	Carnoustie	Action ID	21004
Action Type	Shoreline management plan (coastal adaptive plan)		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>The existing assessment of coastal flood and erosion risk is to be reviewed and updated as required. The plan should include assessment of climate change and develop adaptive approaches to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A shoreline management plan covers this area. This should be reviewed as part of the adaptation plan taking into account best available knowledge on climate change predictions.</p>		
Funding	The review will be subject to funding from Angus Council's revenue budget.		
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with the adaptation plan and other responsible authorities.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.</p>		

Target Area	Carnoustie	Action ID	21005
Action Type	Community engagement		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>The community will have opportunities to get involved with the development of the adaptation plan and any flood related projects and initiatives being developed for Carnoustie and Barry. This will include the flood protection scheme.</p>		
Funding	<p>Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>		
Coordination	<p>Action delivery lead is Angus Council and coordinated with the adaptation plan.</p> <p>Angus Council will liaise with local community groups, the Community Council, residents and land/property owners where appropriate.</p>		

Target Area	Carnoustie	Action ID	21006
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2025
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Hatton sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.</p>		

Funding	Funding for this action is secured within Scottish Water's business plan
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>

Target Area	Carnoustie	Action ID	21007
Action Type	Surface water management plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2034
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or overwhelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.</p> <p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Carnoustie and Barry as a priority area. The surface water management plan identifies areas most at risk from surface water flooding in Carnoustie and Barry and identifies options that could alleviate this risk. The integrated catchment study undertaken by Scottish Water will be reviewed for opportunities to address complex surface water and sewer flood risk and interaction with small/culverted watercourses. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed.</p>		
Funding	<p>The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme). Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.</p>		
Coordination	<p>Action delivery lead is Angus Council in coordination with Scottish Water and other responsible authorities.</p>		

Target Area	Carnoustie	Action ID	21001
Action Type	Flood scheme or works design		
Delivery Lead	Angus Council	Indicative Delivery	Proposed 2022-2028 (subject to funding)
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A river flood protection scheme has been recommended for this area following the recent flood study. The scheme includes a combination of works and natural flood management actions. Development of the scheme will continue to outline design. Current and long term flood risk will be considered, and design will incorporate adaptation actions identified in the adaptation plan for Carnoustie and surface water management actions.</p> <p>The responsible authority proposes this action as the best viable option for managing flood risk in this community. The delivery of this action is subject to capital funding being made available.</p> <p>In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site, and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p>		
Funding	The delivery of the scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme).		
Coordination	Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, other responsible authorities, relevant landowners and the public.		

PVA 02/07/08 (Monifieth)

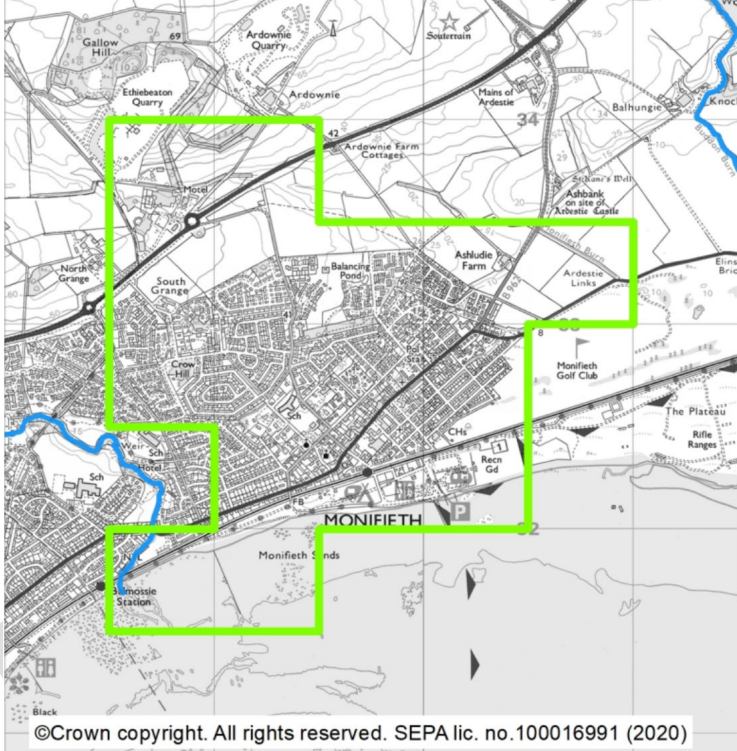
This area is designated as a potentially vulnerable area due to flood risk to Monifieth. The main source of flooding is the Monifieth Burn and there is also flood risk from surface water. Several floods have been recorded in this area, with recent flooding occurring as a result of surface water and river 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

Monifieth (target area 250)

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Monifieth (target area 250)

Summary	Location Map
<p>Monifieth is located on the north shore of the Firth of Tay, within the Angus Council area. The main source of flooding in the Monifieth area is river flooding, however there is also a risk from surface water. There are approximately 950 people and 510 homes and businesses currently at risk from flooding. This is likely to increase to 1,000 people and 560 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 assessment has been improved by flood studies undertaken by Angus Council and Scottish Water. There is a history of localised flooding in this area. The most recent flood was recorded in August 2019 when intensive rainfall led to roads flooding and the closure of the A92.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2501	Avoid flood risk	Avoid inappropriate development that increases flood risk in Monifieth
2502	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Monifieth Flood Protection Scheme
2503	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Monifieth
2504	Reduce flood risk	Reduce the risk of surface water flooding in Monifieth
2505	Reduce flood risk	Reduce the risk of river flooding from the Monifieth Burn in Monifieth

Target Area	Monifieth	Action ID	25002
Action Type	Flood scheme or works design		
Delivery Lead	Angus Council and Dundee City Council	Indicative Delivery	Proposed 2022-2028 (subject to funding)
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A flood protection scheme has been recommended on the Dighty Water following the recent flood study. The scheme would provide a 200 year (0.5% annual exceedance probability) standard of protection and would include flood storage, flood walls and embankments and flood resilience measures. It is recommended that the scheme is progressed to design stage. Additional consideration should be given to natural flood management measures. The impact of climate change should also be further considered which should form the basis for development of an adaptation plan.</p> <p>There may be opportunities to combine procurement of this with the flood protection scheme for Carnoustie. Dundee City Council jointly to progress the preferred option to outline design and detailed design. The responsible authority proposes this action as the best viable option for managing flood risk in this community. The delivery of this action is subject to capital funding being made available.</p>		

	In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.
Funding	The delivery of the scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme).
Coordination	Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, other responsible authorities, relevant landowners and the public.

Target Area	Monifieth	Action ID	25003
Action Type	Flood scheme or works design		
Delivery Lead	Angus Council	Indicative Delivery	Proposed 2022-2028 and 2028-2034 (subject to funding)
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A flood protection scheme has been recommended on the Monifieth Burn following the recent flood study. The scheme includes a combination of works and natural flood management actions. Angus Council and Dundee Council will work together to develop the scheme to outline design stage in cycle 2 - 3. Current and long term flood risk will be considered and the design will incorporate adaptation actions identified in the adaptation plan and surface water management plan for Monifieth. The responsible authority proposes this action as the best viable option for managing flood risk in this community. The delivery of this action is subject to capital funding being made available.</p> <p>In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and</p>		

	Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.
Funding	The delivery of the scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme).
Coordination	Action delivery lead is Angus Council and coordination will be undertaken with SEPA, Marine Scotland, Nature Scotland, other responsible authorities, relevant landowners and the public.

Target Area	Monifieth	Action ID	25004
Action Type	Shoreline management plan (coastal adaptive plan)		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>The existing assessment of coastal flood and erosion risk is to be reviewed and updated as required. The plan should include assessment of climate change and develop adaptive approaches to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A shoreline management plan covers this area. This should be reviewed as part of the adaptation plan taking into account best available knowledge on climate change predictions.</p>		
Funding	The review will be subject to funding from Angus Council's revenue budget.		
Coordination	<p>Action delivery lead is Angus Council and coordination will be undertaken with the adaptation plan and other responsible authorities.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.</p>		

Target Area	Monifieth	Action ID	25001
Action Type	Flood study		
Delivery Lead	Angus Council and Dundee City Council	Indicative Delivery	2022-2028

Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>Angus Council and Dundee City Council will work in partnership to have a study of natural flood management opportunities undertaken which will identify any actions that could reduce flood risk in Monifieth.</p>
Funding	The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from the local authorities capital programmes as appropriate).
Coordination	Action delivery lead is Angus Council with Dundee City Council and coordination will be undertaken with other responsible authorities .

Target Area	Monifieth	Action ID	25005
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2025
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Hatton sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009</p>		
Funding	Funding for this action is secured within Scottish Water's business plan		
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>		

Target Area	Monifieth	Action ID	25006
Action Type	Surface water management plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2034
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or overwhelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.</p> <p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Monifieth.</p> <p>The surface water management plan identifies areas most at risk from surface water flooding in Monifieth and identifies options that could alleviate this risk.</p> <p>The integrated catchment study undertaken by Scottish Water will continue as planned to address complex surface water and sewer flood risk and interaction with small/culverted watercourses.</p> <p>As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed.</p>		
Funding	<p>The delivery of the study is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Angus Council's capital programme). Due to the significant cost of the number and scale of options, it is likely to require any improvements to be delivered in a phased manner over a number of FRM cycles.</p>		
Coordination	<p>Action delivery lead is Angus Council in coordination with Scottish Water and other responsible authorities.</p>		

Target Area	Monifieth	Action ID	25007
Action Type	Adaptation plan		
Delivery Lead	Angus Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>An adaptation master plan will be developed to cover the Angus Council area. As part of this, Angus Council will use best available knowledge on climate change predictions to assess the effect on flood risk infrastructure. From this a long term flood risk management approach will be developed. Any existing strategic initiatives will provide opportunities for adaptive actions to be implemented.</p>		
Funding	The adaptation plan will be subject to funding from Angus Council's revenue budget.		
Coordination	Action delivery lead is Angus Council and coordinated with the surface water management plan and shoreline management plan.		

Target Area	Monifieth	Action ID	25008
Action Type	Community engagement		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>The community will have opportunities to get involved with the development of the adaptation plan and any flood related projects and initiatives being developed in Montrose. Opportunities for a flood resilience group will be sought for the community.</p>		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		

Coordination	<p>Action delivery lead is Angus Council and coordinated with the adaptation plan.</p> <p>Angus Council will liaise with local community groups, the Community Council, residents and land/property owners where appropriate.</p>
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Target Area	Monifieth	Action ID	25009
Action Type	Flood Defence Maintenance		
Delivery Lead	Angus Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Angus Council will continue to maintain the existing coastal flood defences and seek opportunities to work with partners to reduce flood risk from this source.</p>		
Funding	<p>The maintenance of the Flood Protection Scheme will be subject to funding from Angus Council's revenue budget.</p>		
Coordination	<p>Angus Council maintain the existing coastal flood protection scheme and undertake inspections and maintenance as required.</p> <p>Maintenance works will be coordinated with SEPA, NatureScot, landowners and other stakeholders as required.</p>		

Target Area	Monifieth	Action ID	25010
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	<p>SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.</p>		

Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>
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PVA 02/07/09 (Dundee, Broughty Ferry and Invergowrie)

This area is designated as a potentially vulnerable area due to flood risk in Broughty Ferry, Dundee and Invergowrie. There is flood risk from all sources including coastal from the Firth of Tay, surface water and small watercourses. A flood protection scheme has recently been completed in Dundee to protect the city from coastal flooding. There is a long history of flooding in this area. This includes recent flooding due to wave overtopping in Dundee during Storm Ciara, and frequent surface water flooding. There are 3 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

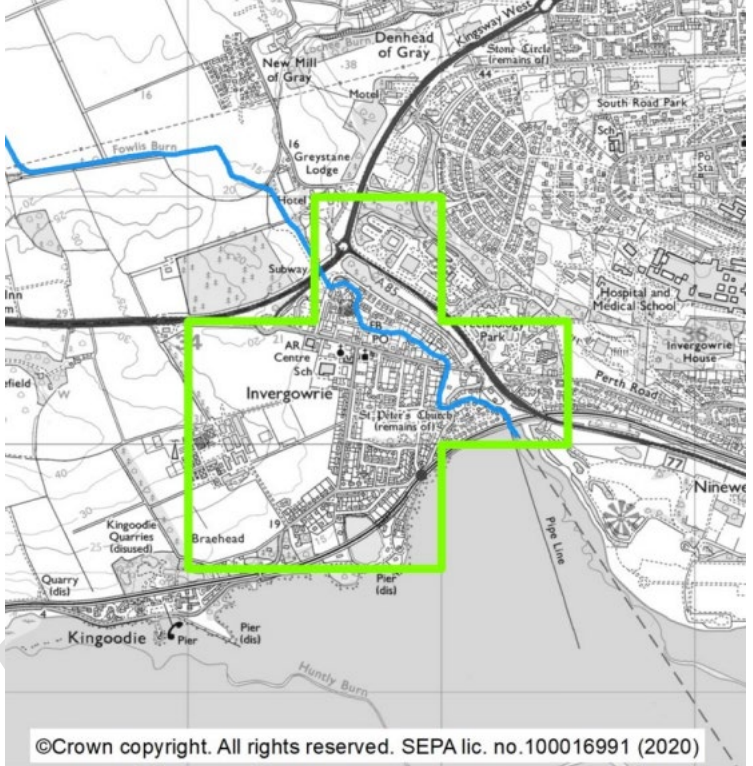
Invergowrie (target area 235)

Broughty Ferry (target area 269)

Dundee (target area 270)

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Invergowrie (target area 235)

Summary	Location Map
<p>Invergowrie lies on the north bank of the Firth of Tay, west of Dundee, within the Perth and Kinross Council area. The main source of flooding is river flooding from the Invergowrie Burn and there is also some risk from surface water. A recent natural flood management flood study carried out by the local authority indicates that there are approximately 26 homes and businesses currently at risk of flooding and that this is likely to increase to 28 homes and businesses by the 2080s due to climate change.</p>	 <p>©Crown copyright. All rights reserved. SEPA lic. no.100016991 (2020)</p> <p>(© Crown copyright and database rights 2022 OS 100023404)</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 assessments of flooding from rivers, surface water and coastal sources. The national assessment of surface water flooding was improved by a surface water management plan and a sewer flood risk assessment. The surface water management plan concluded that the majority of flood risk in Invergowrie was from river sources. An integrated catchment study was also carried out but this concluded that there is no interaction between sewer, river and surface water flooding.

There is a history of flooding in the area. Records are limited but the first flood recorded occurred in August 2004 when the Invergowrie Burn overflowed, affecting properties on Main Street, Burnside Road, Balruddery Farm and the road at Boniface Road and Boniface Place. In January 2011 the Invergowrie Burn overflowed, affecting roads and a residential property. The most recent flood was recorded in January 2016 when 1 residential property flooded.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2351	Avoid flood risk	Avoid inappropriate development that increases flood risk in Invergowrie
2352	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Invergowrie
2353	Reduce flood risk	Reduce the risk of surface water and river flooding from the Invergowrie Burn in Invergowrie

Target Area	Invergowrie	Action ID	23501
Action Type	Flood study		
Delivery Lead	Perth and Kinross Council	Indicative Delivery	2022
Description	<p>A natural flood management study for the Invergowrie Burn was included in the Cycle 1 Tay Estuary Local Flood Risk Management Plan. The study, which commenced in March 2020, was administered by Perth and Kinross Council and awarded to consulting engineers, Sweco UK Ltd.</p> <p>The study concluded that a natural flood management scheme in Invergowrie is not economically viable and therefore no flood scheme is proposed.</p> <p>The study was completed following community engagement in September 2022.</p>		
Funding	Funding for the flood study was allocated from the relevant local authority revenue budgets.		
Coordination	Perth and Kinross Council coordinated the natural flood management study with Dundee City Council, Angus Council and other partners in the Tay Estuary & Montrose Basin local plan district partnership. The study was coordinated with other related actions.		

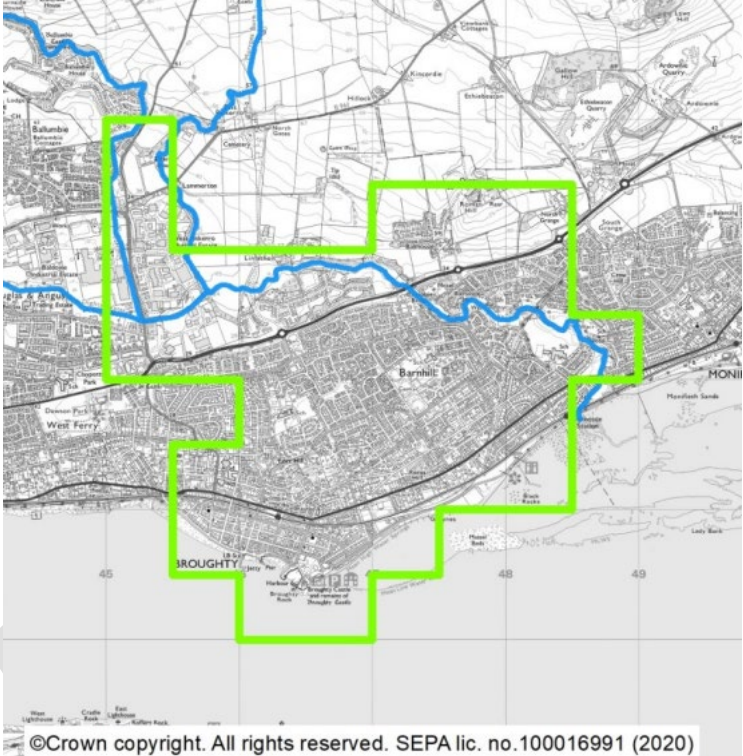
Target Area	Invergowrie	Action ID	23502
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2025
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.</p>		
Funding	Funding for this action is secured through Scottish Water's business plan.		
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA. Outputs of this modelling assessment will be shared with local authorities and SEPA.</p>		

Target Area	Invergowrie	Action ID	23503
Action Type	Community engagement		
Delivery Lead	SEPA and Responsible Authorities	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement will continue in connection with ongoing projects and activities.</p>		
Funding	<p>Community engagement activities will be funded from local authority revenue budgets.</p> <p>SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement.</p> <p>Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>		

Coordination	<p>Community engagement will be coordinated through the Local Plan District partnership between SEPA and the responsible authorities.</p> <p>SEPA and the responsible authorities will use any studies, projects and flood schemes to engage with communities and raise awareness of flood risk.</p> <p>Communications activity will be coordinated through existing arrangements within Local Plan District Partnerships. Information will be disseminated through website, social media and other community engagement activity.</p> <p>SEPA and responsible authorities will coordinate awareness raising activities with related actions.</p>
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Broughty Ferry (target area 269)

Summary	Location Map
<p>Broughty Ferry is located to the east of Dundee, on the northern shore of the Firth of Tay and within the Dundee City Council area. The main source of flooding in Broughty Ferry is surface water, however there is also a risk from river and coastal flooding. Prior to the construction of the coastal flood protection scheme, there were approximately 1,500 people and 900 homes and businesses at risk from flooding. Without any flood protection action taken, this is estimated to increase to approximately 2,800 people and 1,700 homes and businesses by the 2080s due to climate change. However, it is noted that the construction of the coastal flood protection scheme and associated flood study are likely to result in revision of these flood risk estimates.</p>	 <p>©Crown copyright and database rights 2022 OS 100023404</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 for coastal flooding is improved by a flood study carried out by the local authority in support of the Broughty Ferry Coastal Flood Protection Scheme. The national level assessment for river flooding is improved by the Downfield and Dundee/Monifieth and Sidlaws Flood Protection Study completed by the local authority in 2019 which focused on the Dighty Water, Fithie Burn and Gelly Burn in Dundee. The national level assessment for surface water is improved by an integrated catchment study and a surface water management plan. There is a long record of coastal, river and surface water flooding in the area.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2691	Avoid flood risk	Avoid inappropriate development that increases flood risk in Broughty Ferry
2692	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Broughty Ferry Flood Protection Scheme
2693	Avoid flood risk	Avoid an increase in flood risk in Broughty Ferry by the appropriate protection, management and maintenance of sand dunes and the beach in coastal area of Broughty Ferry
2694	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Broughty Ferry
2695	Reduce flood risk	Reduce the risk of surface water flooding in Broughty Ferry
2696	Reduce flood risk	Reduce the risk of river flooding from the Dighty and Fithie Burns in Broughty Ferry

Target Area	Broughty Ferry	Action ID	26901
Action Type	Flood scheme or works implementation		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>The (coastal) flood scheme/works is to be built following agreement of the design, costs and timescales.</p> <p>The Broughty Ferry (coastal) Flood Protection Scheme was completed in June 2022. The impact of climate change should be further considered and information developed should form the basis of an adaption plan.</p>		
Funding	This will be funded from Dundee City Council's revenue budget.		
Coordination	<p>Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD, work on coastal flood mapping and flood warning actions.</p>		

Target Area	Broughty Ferry	Action ID	26902
Action Type	Flood defence maintenance		
Delivery Lead	Dundee City Council	Indicative Delivery	Ongoing
Description	<p>The existing (coastal) flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Following completion of the Broughty Ferry (coastal) Flood Protection scheme, Dundee City Council should start the scheme inspection and maintenance programme.</p> <p>The maintenance programme for the five year period after completion should include monitoring and repair/repositioning/raising of the Broughty Ferry sand dune fencing as required, an annual assessment of the sand dunes, as well as specific site monitoring visits after any storm which is likely to have damaged the dunes.</p> <p>Any remedial work to the sand dunes identified from the annual assessments should be delivered during the early winter, and any damage identified after storms should be repaired as quickly as possible.</p> <p>After a five year period from construction, as well as site monitoring visits following storms, twice yearly monitoring and topographical survey of the dunes should be undertaken and kept under review to ensure the provision of effective flood protection.</p>		
Funding	This will be funded from Dundee City Council's revenue budget.		
Coordination	Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.		

Target Area	Broughty Ferry	Action ID	26903
Action Type	Flood scheme or works design		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>The selected preferred approach for managing river flood risk (primarily from the Dighty and Fithie Burn) is to be designed following the completion of the river flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management.</p>		

	<p>This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A river flood protection study, focussing on the Dighty and Fithie Burns, was carried out and recommended a river flood scheme to manage flood risk from these river sources. The scheme would provide a 1 in 200 year flood (0.5% annual exceedance probability) standard of protection and would include flood storage, flood walls, embankments and flood resilience measures. The delivery of this action is subject to funding being made available. It is recommended that Angus Council and Dundee City Council jointly progress the preferred option to outline design and detailed design. Additional consideration should be given to natural flood management. The impact of climate change should also be further considered which should form the basis for development of an adaptation plan. In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p>
Funding	This will be funded from Dundee City Council's revenue budget.
Coordination	Action delivery lead is Dundee City Council in coordination with Angus Council.

Target Area	Broughty Ferry	Action ID	26904
Action Type	Flood scheme or works implementation		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>The (river) flood scheme/works, primarily associated with the Dighty and Fithie Burn is to be built following agreement of the design, costs and timescales.</p> <p>The responsible authority proposes this action as the best option for managing river flood risk (primarily from the Dighty and Fithie Burn) in this community. The delivery of this action is subject to funding being made available. Dundee City Council and Angus Council should jointly progress the proposed river flood scheme to construction based on the detailed design. The impact of climate change should be further considered. As built drawings should be made available to SEPA, for consideration in the Scottish Flood Defence Asset Database, flood map updates and flood warning scheme updates.</p>		

Funding	Scottish Government Capital fund with match funding from Dundee City Council
Coordination	<p>Action delivery lead is Dundee City Council. The action should be coordinated between Angus Council and Dundee City Council.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>

Target Area	Broughty Ferry	Action ID	26905
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2025
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Hatton sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009</p>		
Funding	Funding for this action is secured within Scottish Water's business plan		
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>		

Target Area	Broughty Ferry	Action ID	26906
Action Type	Surface water management plan		
Delivery Lead	Dundee City Council	Indicative Delivery	2025-2028

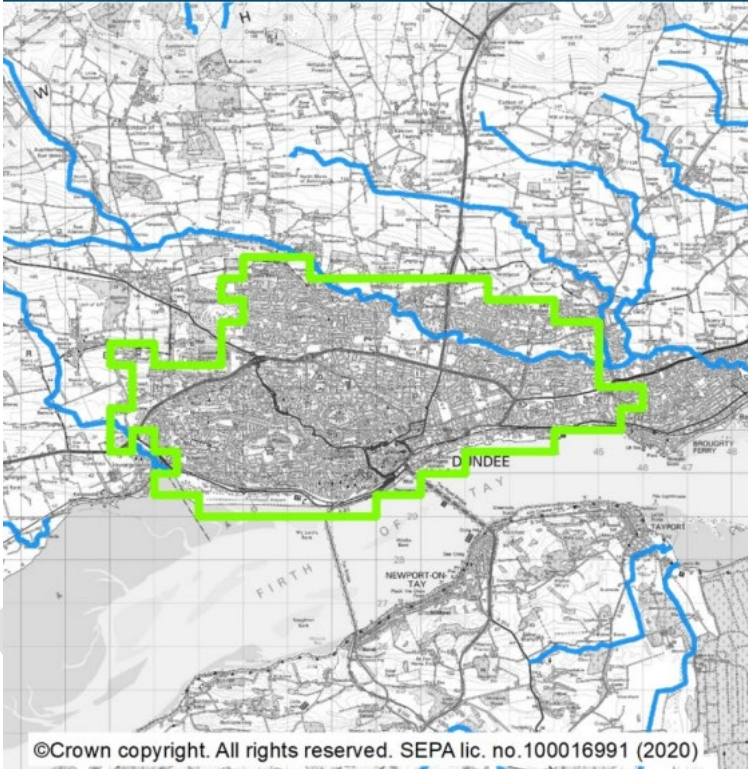
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>The surface water management plan should be completed as planned, based on the findings of the integrated catchment study, and updated as required. Dundee City Council and Scottish Water should jointly develop surface water drainage strategies in appropriate areas as part of surface water management planning. Current and long term flood risk should be considered and how the area will adapt to changes in flood risk in the future.</p>
Funding	This will be funded from Dundee City Council's revenue budget.
Coordination	Action delivery lead is Dundee City Council in coordination with Scottish Water.

Target Area	Broughty Ferry	Action ID	26907
Action Type	Community engagement		
Delivery Lead	Dundee City Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement and awareness raising should be carried out based on the development of the river and coastal flood protection schemes, surface water management plan, and any surface water drainage strategies being developed jointly by Dundee City Council and Scottish Water.</p>		
Funding	<p>Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>		
Coordination	Action delivery lead is Dundee City Council in coordination with Scottish Water and SEPA.		

Target Area	Broughty Ferry	Action ID	26908
Action Type	Land use planning		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>Planning authority should ensure that their development plan and planning decision-making supports delivery of sustainable flood management.</p> <p>Dundee City Council should ensure that their development plan supports the management and protection of existing natural features that have the potential to contribute to managing flood risk. Dundee City Council should agree how the protection, management and maintenance of sand dunes and the beach in coastal area of Broughty Ferry can be protected through the local development planning process.</p>		
Funding	This will be funded from Dundee City Council's revenue budget.		
Coordination	Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.		

Target Area	Broughty Ferry	Action ID	26909
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Dundee (target area 270)

Summary	Location Map
<p>Dundee is located on the northern shore of the Firth of Tay within the Dundee City Council area. The main source of flooding in Dundee is surface water, however there is also a risk of river flooding and a residual risk from coastal flooding. A coastal flood protection scheme for Dundee coastline was completed in 2018. Prior to the construction of the coastal flood protection scheme, there were approximately 6,100 people and 4,400 homes and businesses at risk from flooding. Without any flood protection action taken, this is estimated to increase to approximately 8,600 people and 6,000 homes and businesses by the 2080s due to climate change. However, it is noted that the construction of the coastal flood protection scheme is likely to result in a revision of these flood risk estimates.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 for coastal flooding is improved by a flood study completed by the local authority in 2018 in support of the Dundee Flood Protection Scheme covering City Quay to Dundee Airport. The national level assessment for river flooding is improved by the Downfield and Dundee/Monifieth and Sidlaws Flood Protection Study completed by the local authority in 2019 which focused on the Dighty Water, Fithie Burn and Gelly Burn. The national assessment for surface water is improved by an integrated catchment study carried out by Scottish Water, a surface water management plan and a sewer flood risk assessment. There is a long record of coastal, river, and surface water flooding in this area. It is noted that coastal flooding has been reduced by the recent completion of the coastal

flood protection scheme. The impact of this scheme is not reflected in the counts of homes and businesses at risk given in the summary information.

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.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2701	Avoid flood risk	Avoid inappropriate development that increases flood risk in Dundee
2702	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Dundee Flood Protection Scheme
2703	Avoid flood risk	Avoid an increase in flood risk in Dundee by the appropriate protection, management and maintenance of natural features in Dighty, Fithie Burn, Gelly Burn, Gorrie Burn and Murroes Burn catchments
2704	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Dundee
2705	Reduce flood risk	Reduce the risk of flooding from Dighty Water in Dundee
2706	Reduce flood risk	Reduce the risk of coastal flooding in Dundee Central and Dundee Airport
2707	Reduce flood risk	Reduce the risk of surface water flooding in Dundee

Target Area	Dundee	Action ID	27001
Action Type	Flood scheme or works design		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028

Description	<p>The selected preferred approach for managing (coastal) flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Phase 2 of the Dundee (coastal) Flood Protection Scheme includes Dundee City Quay, Docks and Airport. The scheme includes set-back flood walls, a replacement lock gate at the Docks and a revetment at the Airport, and will provide protection against a 1 in 200 year flood (0.5% annual exceedance probability). The delivery of this action is subject to funding being made available. The scheme should progress to detailed design. The impact of climate change should be further considered and information developed should form the basis for development of an adaptation plan. In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p>
Funding	This will be funded from Dundee City Council's revenue budget.
Coordination	<p>Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping and flood warning actions.</p>

Target Area	Dundee	Action ID	27003
Action Type	Flood defence maintenance		
Delivery Lead	Dundee City Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Dundee City Council should continue to maintain the Dundee (coastal) Flood Protection Scheme by undertaking programmed and reactive maintenance.</p>		
Funding	This will be funded from Dundee City Council's revenue budget.		

Coordination	Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.
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Target Area	Dundee	Action ID	27004
Action Type	Flood scheme or works design		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>The selected preferred approach for managing river flood risk (primarily from the Dighty) is to be designed following the completion of the river flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A river flood protection study, focussing on the Dighty, was carried out at this location that recommended a river flood scheme. The scheme would provide a 1 in 200 year flood (0.5% annual exceedance probability) standard of protection and would include flood storage, flood walls and embankments and flood resilience measures.</p> <p>The delivery of this action is subject to funding being made available. It is recommended that Angus Council and Dundee City Council jointly progress the preferred option to outline design and detailed design. Additional consideration should be given to natural flood management. The impact of climate change should also be further considered which should form the basis for development of an adaptation plan.</p> <p>In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p>		
Funding	This will be funded from Dundee City Council's revenue budget.		
Coordination	Action delivery lead is Dundee City Council and coordination will be required with Angus Council.		

Target Area	Dundee	Action ID	27005
Action Type	Flood scheme or works implementation		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028
Description	<p>The (river) flood scheme/works, primarily associated with the Dighty, is to be built following agreement of the design, costs and timescales.</p> <p>The responsible authority proposes this action as the best option for managing river flood risk (primarily from the Dighty and Fithie Burn) in this community. The delivery of this action is subject to funding being made available. Dundee City Council and Angus Council should jointly progress the proposed river flood scheme to construction based on the detailed design. The impact of climate change should be further considered and information developed should form the basis for development of an adaptation plan. As built drawings should be made available to SEPA, for consideration in the Scottish Flood Defence Asset Database, flood map updates and flood warning scheme updates.</p>		
Funding	Scottish Government Capital fund with match funding from Dundee City Council		
Coordination	<p>Action delivery lead is Dundee City Council and coordination will be required with Angus Council.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>		

Target Area	Dundee	Action ID	27006
Action Type	Flood scheme or works design		
Delivery Lead	Scottish Water and Dundee City Council	Indicative Delivery	2022-2034
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>The joint integrated catchment study between Scottish Water and Dundee City Council to consider potential options to reduce surface water and sewer flooding has identified high level preferred options. Supplementary</p>		

	<p>investigation or survey work is required to verify some assumptions made during the optioneering stage of the study and design of the preferred options is to be developed. Design of the preferred options is to be developed through a partnership working arrangement.</p> <p>In accordance with the flood risk management plan, as part of the scheme or works, the responsible authority should aim to ensure the action will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Protection Area, Special Area of Conservation and Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p> <p>The Cycle 1 ICS Optioneering study identified a number of options to reduce the risk of surface water and sewer flooding across the city. Due to the complex nature of the drainage within the city, there are many interdependencies between the potential options. Therefore, there is a need to expand on the scope of the previous study to widen the exploration of opportunities to reduce flood risk across the extent of the drainage catchments. This will allow for partners to fully understand the interactions between the watercourse, surface flows and the sewer network and for a holistic plan for flood risk management to be developed across the catchment.</p> <p>A working partnership has been developed between Scottish Water and Dundee City Council to enable this joint planning activity to be carried out in a collaborative manner to ensure that the strategic plan is being produced for the future needs of the City and not individual organisations. Due to the large scale and cost of the required interventions, it is expected that opportunities will be planned and delivered in a phased manner over a number of FRM cycles.</p>
Funding	<p>Progress on this action will be dependent on securing funding from all relevant agencies to carry out and support this work.</p> <p>Delivery of 'Strategies' will be dependant on securing funding from partners and external bodies.</p> <p>Dundee City Council's role in this action will be funded from their revenue budget.</p>
Coordination	<p>Action delivery leads are Scottish Water and Dundee City Council through a partnership agreement.</p> <p>The action will be co-ordinated through the collaborative Water Resilient Dundee partnership working Group (Dundee City Council & Scottish Water)</p>

Target Area	Dundee	Action ID	27007
Action Type	Sewer flood risk assessment		
Delivery Lead	Scottish Water	Indicative Delivery	2023-2035
Description	<p>The volume of water that would overwhelm the sewer system and cause flooding from man-holes or inside our homes is to be assessed, to support understanding of the performance of the urban drainage network</p> <p>Scottish Water will carry out an assessment of sewer flood risk within the highest priority sewer catchments, which includes Hatton sewer catchment in this target area. This will help to improve knowledge and understanding of potential surface water flood risk. Funding for this action is secured through Scottish Water's strategic planning commitments.</p> <p>Scottish Water will undertake a modelling assessment in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009</p>		
Funding	Funding for this action is secured within Scottish Water's business plan		
Coordination	<p>Action delivery lead is Scottish Water in coordination with the local authority and SEPA.</p> <p>Outputs of this modelling assessment will be shared with local authorities and SEPA</p>		

Target Area	Dundee	Action ID	27008
Action Type	Surface water management plan		
Delivery Lead	Dundee City Council	Indicative Delivery	2025-2028
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p>		

	The surface water management plan should be completed as planned, based on the findings of the integrated catchment study, and updated in future as required. Dundee City Council and Scottish Water should jointly develop surface water drainage strategies in appropriate areas as part of surface water management planning. Current and long term flood risk should be considered and how the area will adapt to changes in flood risk due to climate change.
Funding	This will be funded from Dundee City Council's revenue budget.
Coordination	Action delivery lead is Dundee City Council and coordination will be required with Scottish Water and SEPA.

Target Area	Dundee	Action ID	27009
Action Type	Community engagement		
Delivery Lead	Dundee City Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement and awareness raising should be carried out based on the outcomes of the river and coastal flood scheme development, surface water management plan and surface water drainage strategies being developed jointly by Dundee City Council and Scottish Water.</p>		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		
Coordination	Action delivery lead is Dundee City Council in coordination with Scottish Water.		

Target Area	Dundee	Action ID	27002
Action Type	Flood scheme or works implementation		
Delivery Lead	Dundee City Council	Indicative Delivery	2022-2028

Description	<p>The (coastal) flood scheme/works is to be built following agreement of the design, costs and timescales.</p> <p>The responsible authority proposes this action as the best option for managing flood risk in this community. The delivery of this action is subject to funding being made available.</p> <p>Dundee City Council should progress the phase 2 of the Dundee (coastal) Flood Protection Scheme which includes Dundee City Quay, Docks and Airport. As built drawings should be made available to SEPA, for consideration in the Scottish Flood Defence Asset Database, flood map updates and flood warning scheme updates. The impact of climate change should be further considered and information developed should form the basis for development of an adaptation plan.</p>
Funding	Scottish Government Capital fund with match funding from Dundee City Council
Coordination	<p>Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD, work on coastal flood mapping and flood warning actions.</p>

Target Area	Dundee	Action ID	27010
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.		

	SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.
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Target Area	Dundee	Action ID	27011
Action Type	Strategic mapping improvements		
Delivery Lead	SEPA	Indicative Delivery	2023-2026
Description	<p>SEPA will continue to update flood maps based on new information.</p> <p>SEPA will be undertaking a review of coastal flood modelling in this target area to identify where it may be appropriate to include the impact of waves on coastal flooding. We will progress with improved flood modelling and mapping in the highest priority areas taking account of availability of data to support the modelling work.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>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.</p>		

PVA 02/07/10 (Newburgh)

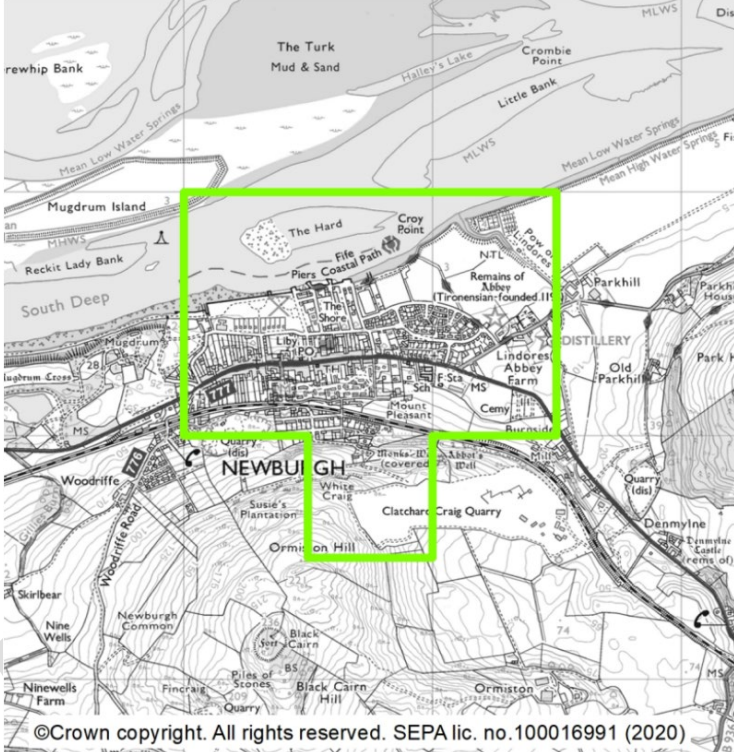
This area is designated as a potentially vulnerable area primarily due to coastal flood risk to Newburgh. There is a history of flooding in this area. There is 1 target area in this potentially vulnerable area, which has been the focus of further assessment, this is identified below. Further information on the objectives and actions to manage flood risk within this area is provided below.

List of target areas

Newburgh (target area 252)

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Newburgh (target area 252)

Summary	Location Map
<p>Newburgh is located on the south bank of the inner Tay Estuary and is within the Fife Council area. The only significant source of flooding in Newburgh is coastal flooding. There are approximately 310 people and 150 homes and businesses currently at risk from flooding. This is likely to increase to 380 people and 190 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 for surface water flooding is improved by a sewer flood risk assessment. There is a history of flooding in this area, with recent floods recorded in February 2015 and March 2020 when roads were inundated by seawater. In August 2020 transport infrastructure was again affected by flooding.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2521	Avoid flood risk	Avoid inappropriate development that increases flood risk in Newburgh
2522	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Newburgh
2523	Reduce flood risk	Reduce the risk of coastal flooding and erosion in Newburgh

Target Area	Newburgh	Action ID	25202
Action Type	Strategic mapping improvements		
Delivery Lead	SEPA	Indicative Delivery	2023-2026
Description	<p>SEPA will continue to update flood maps based on new information.</p> <p>SEPA will be undertaking a review of coastal flood modelling in this target area to identify where it may be appropriate to include the impact of waves on coastal flooding. We will progress with improved flood modelling and mapping in the highest priority areas taking account of availability of data to support the modelling work.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>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.</p>		

Target Area	Newburgh	Action ID	25201
Action Type	Shoreline management plan (coastal adaptive plan)		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	The existing assessment of coastal flood and erosion risk is to be reviewed and updated as required. The plan should include assessment of climate change and develop adaptive approaches to allow for the impacts of climate change to be monitored, understood and managed.		

	A shoreline management plan has been produced for this area by Fife Council. The plan is now operational and no review is planned in the short term. In the longer term the plan will be reviewed with the latest data and adaptive approaches considered in relation to the impacts of climate change.
Funding	This will be funded from Fife Council's Revenue Budget
Coordination	Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.

Target Area	Newburgh	Action ID	25203
Action Type	Community engagement		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk. Community engagement should be carried out based on the findings of the flood studies in the area.		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.		

Target Area	Newburgh	Action ID	25204
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition. Asset owners should continue to maintain the existing coastal defences.		

Funding	This will be funded from Fife Council's Revenue Budget
Coordination	Action delivery leads are Fife Council and the asset owner. Coordination will be determined once the actions have been finalised.

Target Area	Newburgh	Action ID	25205
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Target Area	Newburgh	Action ID	25206
Action Type	Flood study (options appraisal)		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p>		

	<p>The Newburgh flood study commissioned by Fife Council advised that a flood protection scheme may be feasible in the long term. Further work is required to justify the preferred option in terms of economic and qualitative benefits, and progression of the scheme is subject to the availability of funding. Current and long term flood risk should be considered and how the flood protection schemes and the area will adapt to changes in flood risk due to climate change.</p>
<p>Funding</p>	<p>This will be funded from Fife Council's Revenue Budget</p>
<p>Coordination</p>	<p>Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities</p>

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PVA 02/07/11 (St Andrews)

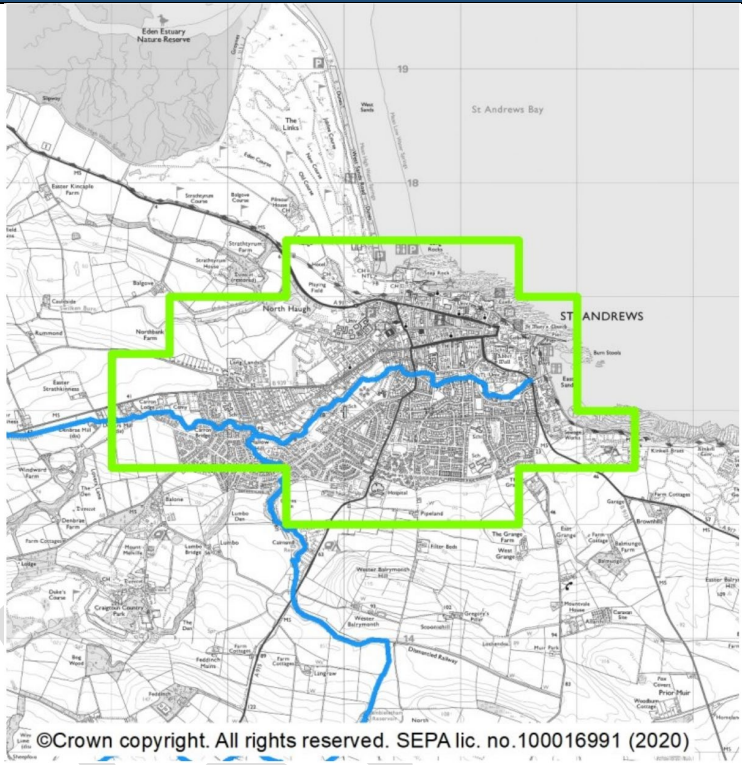
This area is designated as a potentially vulnerable area due to flood risk to St. Andrews. The main source of flooding is the Kinness Burn and there is also risk from surface water and coastal flooding. There is a history of flooding in this area, with recent surface water floods recorded in 2019 and 2020. Flooding from coastal wave overtopping as also been recorded 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 Andrews (target area 257)

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St Andrews (target area 257)

Summary	Location Map
<p>St Andrews is a town located on the east coast of Scotland within the Fife Council area. The main sources of flooding in St Andrews are surface water and river flooding, and there is also a risk from coastal flooding. There are approximately 1,200 people and 700 homes and businesses currently at risk from flooding. This is likely to increase to 1,500 people and 860 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 assessments for river flooding is improved by the Kinness Burn Flood Study completed in 2019. The national assessment of coastal flooding is improved by the Fife Shoreline Management Plan. The national level assessment for surface water flooding is improved by a sewer flood risk assessment. There is a long record of flooding in this area with records of frequent river flooding. A notable flood occurred in November 2009 when over 20 properties flooded at Kinnessburn Road and Fleming Place because of heavy rainfall, causing the Kinness Burn to overtop its banks. In August 2019 severe rainfall caused disruption to the community, property damage and impacts to the roads network.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2571	Avoid flood risk	Avoid inappropriate development that increases flood risk in St Andrews
2572	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Kinness Burn Flood Protection Scheme
2573	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of flood defences along the coast in St Andrews
2574	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in St Andrews
2575	Reduce flood risk	Reduce the risk of river flooding from the Kinness Burn in St Andrews
2576	Reduce flood risk	Reduce the risk of surface water flooding in St Andrews

Target Area	St Andrews	Action ID	25701
Action Type	Flood scheme or works design		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Development of the Kinness Burn Flood Protection Scheme should continue into outline and detailed design stage as planned. The preferred option provides 200 year standard of protection and includes 35% climate change allowance. The scheme consists of flood defence walls and removal of bridges. Fife Council should continue to pursue investigating the cost viability of implementing a two-stage re-meandering channel along the straightened reach at Kinnessburn Road with funding secured from the Water Environment Fund. This can provide long-term health and wellbeing benefits that could benefit to the community of St Andrews along with the potential for flood reduction which would require detail assessment in a separate study.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		

Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities
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Target Area	St Andrews	Action ID	25702
Action Type	Flood scheme or works implementation		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>The flood scheme/works is to be built following agreement of the design, costs and timescales.</p> <p>Procurement and construction of the Kinness Burn Flood Protection Scheme should continue following the detailed design.</p>		
Funding	Scottish Government Capital fund with match funding from Fife Council per FRM agreement		
Coordination	<p>Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>		

Target Area	St Andrews	Action ID	25703
Action Type	Surface water management plan		
Delivery Lead	Fife Council	Indicative Delivery	To be completed early in FRM Cycle 2
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A surface water management plan should be developed to improve understanding of surface water issues. The interaction between surface water, river and coastal flooding should be assessed. The plan should quantify flood risk and look at high level options to manage this risk.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		

Coordination	Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.
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Target Area	St Andrews	Action ID	25705
Action Type	Community engagement		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>		
Funding	<p>Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>		
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.		

Target Area	St Andrews	Action ID	25706
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance of the existing coastal defences at St Andrews should continue.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery leads are Fife Council and the asset owner. Coordination will be determined once the actions have been finalised.		

Target Area	St Andrews	Action ID	25707
Action Type	Flood warning maintenance		
Delivery Lead	SEPA	Indicative Delivery	Second half of cycle
Description	<p>The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.</p> <p>SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.</p>		
Funding	SEPA's role in this action is funded by Scottish Government through SEPA's grant in aid settlement.		
Coordination	<p>Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.</p> <p>SEPA will work with the local authorities on the potential to coordinate flood warning improvements with the flood studies investigations and flood scheme works. SEPA will continue to raise awareness of flood warning, and engage with communities about the service when required.</p>		

Target Area	St Andrews	Action ID	25704
Action Type	Shoreline management plan (coastal adaptive plan)		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>The existing assessment of coastal flood and erosion risk is to be reviewed and updated as required. The plan should include assessment of climate change and develop adaptive approaches to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A shoreline management plan has been produced for this area by Fife Council. The plan is now operational and no review is planned in the short term. In the longer term the plan will be reviewed with the latest data and adaptive approaches considered in relation to the impacts of climate change.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		

Coordination	Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised SEPA will work with the local authority on the potential to coordinate this action with work on coastal flood mapping.
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PVA 02/07/12 (Pitscottie)

This area is designated as a potentially vulnerable area due to flood risk to Kemback, Pitscottie and Ceres. The main source of flooding is river flooding from small watercourses. There is a history of flooding in the area with flooding of properties recorded in Pitscottie from the Ceres Burn. Surface water flooding has also been recorded 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.

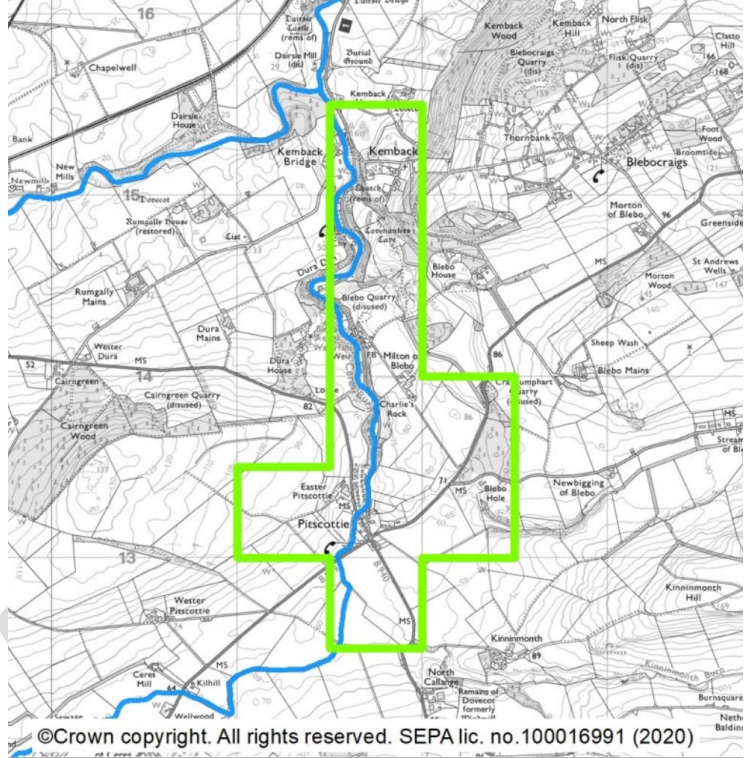
List of target areas

Pitscottie and Kemback (target area 175)

Ceres (target area 284)

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Pitscottie and Kemback (target area 175)

Summary	Location Map
<p>Pitscottie and Kemback are villages located in Fife in close proximity of Ceres Burn. The main source of flooding in Pitscottie and Kemback is river flooding. There are approximately 110 people and 70 properties at risk from flooding, which is a significant proportion of the community. This is estimated to increase to 120 people and 80 properties by the 2080s due to climate change.</p>	 <p>(© Crown copyright and database rights 2022 OS 100023404)</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 the main source of information in this area. There is a long record of river flooding in this area, with notable floods in February 1977, April 1988, April 1994, April 1992, October 2012 and April 2000 when the Ceres Burn burst its banks inundating homes, affecting rail transport and causing disruption to power and utilities.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
1751	Avoid flood risk	Avoid inappropriate development that increases flood risk in Kemback and Pitscottie
1752	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of flood defences along the Blebo Burn and Ceres Burn
1753	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Kemback and Pitscottie
1754	Reduce flood risk	Reduce the risk of river flooding in Kemback and Pitscottie


Target Area	Pitscottie and Kemback		Action ID	17502
Action Type	Community engagement			
Delivery Lead	Fife Council	Indicative Delivery	Ongoing. Conclusions subject to outcome of FS public meeting 29 Sept 22	
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>			
Funding	<p>Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>			
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.			

Target Area	Pitscottie and Kemback		Action ID	17503
Action Type	Flood defence maintenance			
Delivery Lead	Fife Council	Indicative Delivery	Ongoing	

Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance to the Pitscottie Flood Protection Scheme which runs along the Blebo Burn and Ceres Burn should continue. Updates to the maintenance regime should be made based on the findings of the flood study.</p>
Funding	This will be funded from Fife Council's Revenue Budget
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities

Target Area	Pitscottie and Kemback	Action ID	17501
Action Type	Flood study		
Delivery Lead	Fife Council	Indicative Delivery	Programmed completion March 23
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>The flood study should be delivered as scheduled and include flood modelling and assessment of existing flood defences in Pitscottie and Kemback. Should flood risk be confirmed, the study should include scoping to future flood risk management activities in the area. Flood risk should be quantified for present day and future flood risk. Current and long term flood risk should be considered and how the flood protection schemes and the area will adapt to changes in flood risk due to climate change.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	<p>Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>		

Ceres (target area 284)

Summary	Location Map
<p>The village of Ceres is near St Andrews, within the Fife Council area. Ceres village is located at the confluence of the Ceres Burn, the Craigrothie Burn and the Latch Burn. The main source of flooding is river flooding. There is an existing flood protection scheme that protects homes and businesses from flooding. There are approximately 20 people and 10 homes and businesses currently at risk of flooding. This is estimated to increase to 30 people and 15 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 assessment for river flooding is improved by previous studies completed by Fife Council. The national level assessment for surface water flooding is improved by a sewer flood risk assessment. There are frequent records of flooding in this area, with flooding noted in February 1977, April 1992 and October 2012 and August 2019. Existing flood defences along the Blebo Burn, Ceres Burn, Craigrothie Burn, Latch Burn and the old lade provide protection against flooding in Ceres.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2841	Avoid flood risk	Avoid inappropriate development that increases flood risk in Ceres
2842	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of flood defences along the Ceres Burn and Latch Burn
2843	Improve data and understanding	Improve data and understanding of flood defences along the Ceres Burn and Latch Burn in Ceres
2844	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Ceres

Target Area	Ceres	Action ID	28401
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing. Extensive repairs to masonry walls at channel of Ceres Burn at Bow Butts
Description	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition. Maintenance to the Ceres Burn and Latch Burn flood defences should continue.		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

Target Area	Ceres	Action ID	28402
Action Type	Adaptation plan		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.		

	A climate change adaptation plan should be developed in relation to management of the existing defences owned by Fife Council. This is proposed as a long-term action covering the Fife Council area.
Funding	The adaptation plan will be subject to funding from Fife Council's revenue budget.
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities

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PVA 02/07/13 (Cupar and Springfield)

This area is designated as a potentially vulnerable area due to flood risk to Cupar and Springfield. The main sources of flooding are surface water and the River Eden and Lady Burn. There is a history of flooding in this location, with recent flooding recorded in 2019 and 2020. 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.

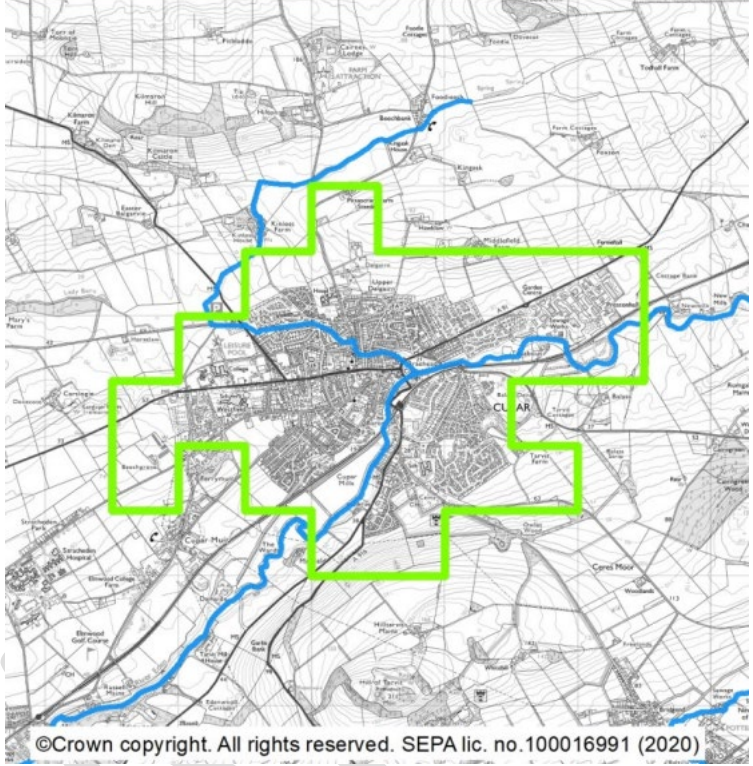
List of target areas

Cupar (target area 218)

Springfield (target area 256)

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Cupar (target area 218)

Summary	Location Map
<p>Cupar is a town to the north of the Lomond Hills, in an area known as the Howe of Fife. It is in the Fife Council area. The main sources of flooding in Cupar are river and surface water flooding. There are approximately 1,000 people and 680 properties approximately at risk from flooding. This is estimated to increase to approximately 1,300 people and 830 properties by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404)</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 for river flooding is improved by the River Eden and Lady Burn flood study completed in 2019, and for surface water flooding is improved by a sewer flood risk assessment.

There is a long record of flooding in this area, notably in July 2009 when flooding caused damage to 18 properties, shops and roads, and in December 2012 when homes flooded. In August 2019 Fife was subject to severe disruption from extreme rainfall which caused disruption to many communities including the Cupar area through flooding, property damage and impacts to the roads network. A recent flood was recorded in February 2020 when severe rainfall caused disruption to the community.

The Millfield of Cupar Flood Protection Scheme is designed to manage surface water flows and offers some protection against flooding in this area.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2181	Avoid flood risk	Avoid inappropriate development that increases flood risk in Cupar
2182	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Millfield of Cupar Flood Protection Scheme
2183	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Cupar
2184	Reduce flood risk	Reduce the risk of river flooding from the River Eden and Lady Burn in Cupar
2185	Reduce flood risk	Reduce the risk of surface water flooding in Cupar

Target Area	Cupar	Action ID	21801
Action Type	Flood study		
Delivery Lead	Fife Council	Indicative Delivery	Completed in FRM Cycle 1
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>The Eden and Lady Burn Flood Study has concluded. Fife Council are considering next steps.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	<p>Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities</p> <p>SEPA will work with the local authority on the potential to coordinate this action with an update to SFDAD.</p>		

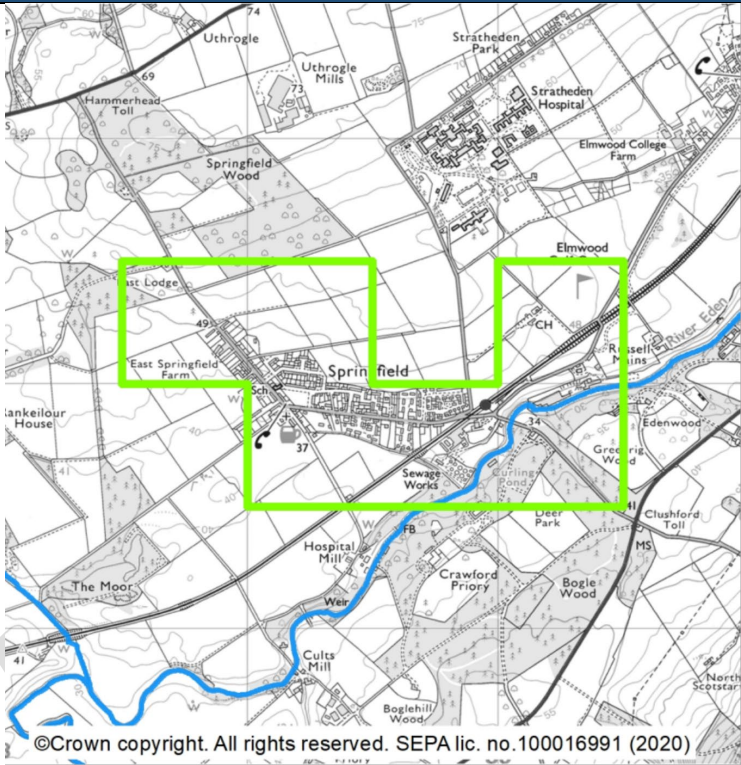
Target Area	Cupar	Action ID	21802
Action Type	Surface water management plan		
Delivery Lead	Fife Council	Indicative Delivery	To be completed early in FRM Cycle 2
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>Fife Council should complete the proposed surface water management plan, taking into account the results of the sewer modelling. Current and long term flood risk should be considered, including the performance of the existing flood protection scheme, along with how the area may adapt to future flood risk.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.		

Target Area	Cupar	Action ID	21803
Action Type	Community engagement		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.		

Target Area	Cupar	Action ID	21804
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance to the Millfield of Cupar Flood Protection Scheme should continue and updates to the maintenance regime be made as required.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

Target Area	Cupar	Action ID	21805
Action Type	Adaptation plan		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A climate change adaptation plan should be developed in relation to management of the existing defences owned by Fife Council. This is proposed as a long-term action covering the Fife Council area.</p>		
Funding	The adaptation plan will be subject to funding from Fife Council's revenue budget.		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

Springfield (target area 256)

Summary	Location Map
<p>Springfield is a village that lies at the edge of the Howe of Fife and to the south-west of the town of Cupar. It is located within the Fife Council area. The main source of flooding in Springfield is surface water. There are approximately 80 people and 40 homes and businesses currently at risk from flooding. There is no expected increase in flood risk by the 2080s due to climate change.</p>	 <p>(© Crown copyright and database rights 2022 OS 100023404)</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 for surface water flooding is improved by a sewer flood risk assessment. There are limited records of flooding in this area, with a flood recorded in Springfield in March 2004 when a minor road within a residential area flooded. Recently in August 2020 the roads were affected by flooding.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2561	Avoid flood risk	Avoid inappropriate development that increases flood risk in Springfield
2562	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Springfield
2563	Reduce flood risk	Reduce the risk of surface water flooding in Springfield

Target Area	Springfield	Action ID	25601
Action Type	Surface water management plan		
Delivery Lead	Fife Council	Indicative Delivery	To be completed early in FRM Cycle 2
Description	<p>Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system are to be identified. These priority areas will provide a baseline for the identification of next steps in managing water ponding or over-whelmed drainage systems. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>The surface water management plan should be undertaken in order to improve understanding of surface water flood risk in Springfield and to ascertain the requirements of any future options to manage flood risk. Current and long-term flood risk should be considered.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.		

Target Area	Springfield	Action ID	25602
Action Type	Community engagement		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>		

Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.

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PVA 02/07/14 (Kingskettle and Kettlebridge)

This area is designated as a potentially vulnerable area due to flood risk to Kingskettle, Kettlebridge and Freuchie from small watercourses. There is a history of flooding in this area, with the recent floods occurring in Freuchie due to surface water flooding and in Kingskettle due to river and surface water flooding. 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.

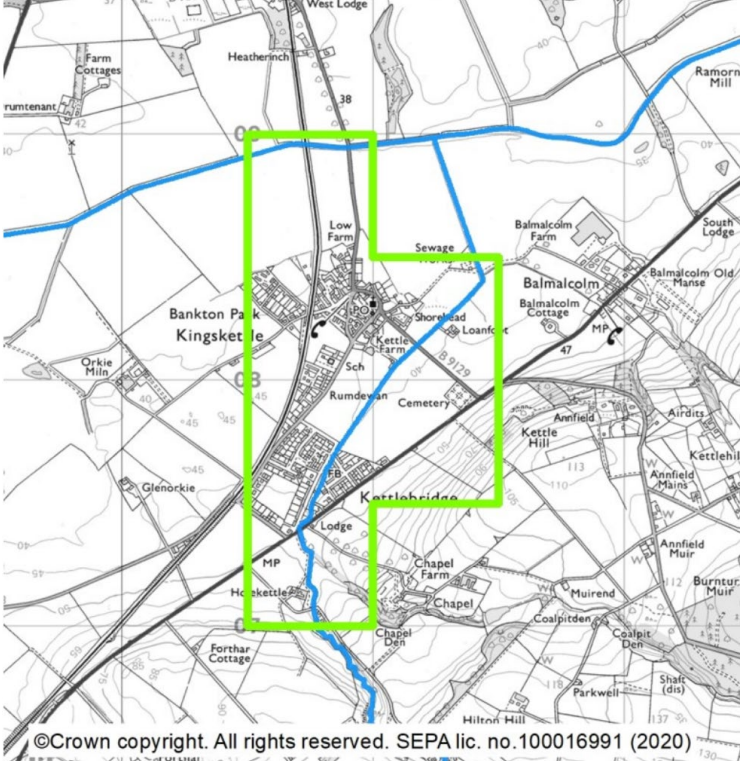
List of target areas

Kingskettle and Kettlebridge (target area 238)

Freuchie (target area 288)

DRAFT

Kingskettle and Kettlebridge (target area 238)

Summary	Location Map
<p>Kingskettle and Kettlebridge are villages located in the Howe of Fife, within the Fife Council area. The main source of flooding is river flooding from the Kettle Burn. There are approximately 80 people and 40 homes and businesses currently at risk from flooding. This is likely to increase to approximately 100 people and 50 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 for surface water flooding is improved by a sewer flood risk assessment. There are limited records of flooding in this area. 3 floods have been recorded, the first in December 2012, when the banks of two streams burst and flooded homes and roads. The second flood was recorded in March 2019, with surface water flooding roads and the most recent flood was recorded in August 2020 again with surface water flooding roads.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2381	Avoid flood risk	Avoid inappropriate development that increases flood risk in Kingskettle and Kettlebridge
2382	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Kingskettle and Kettlebridge
2383	Reduce flood risk	Reduce the risk of river flooding from the Kettle Burn in Kingskettle and Kettlebridge

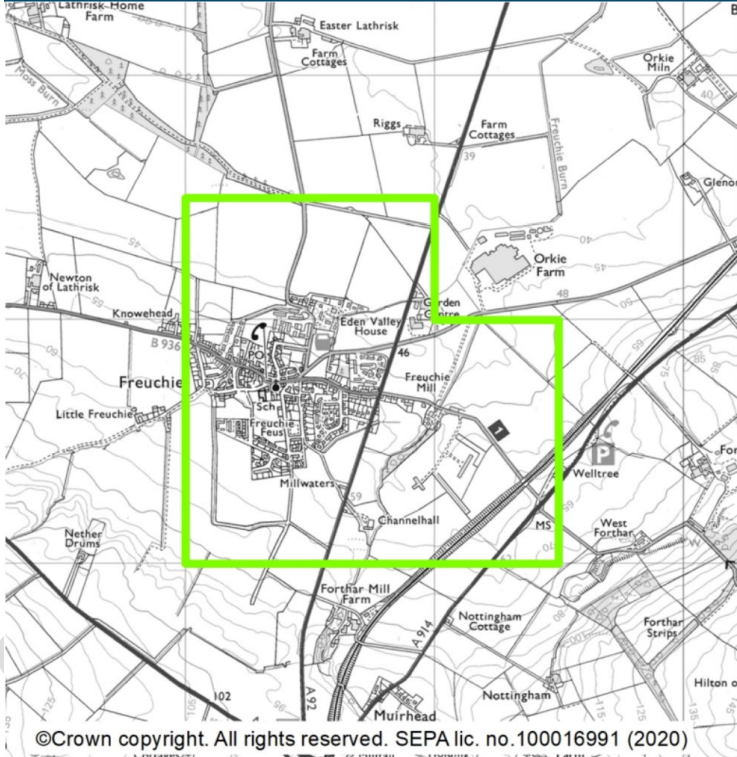
Target Area	Kingskettle and Kettlebridge		Action ID	23801
Action Type	Flood study			
Delivery Lead	Fife Council	Indicative Delivery	2022-2028	
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>The scheduled cycle 1 natural flood management study should continue to its conclusion.</p>			
Funding	This will be funded from Fife Council's Revenue Budget			
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities			

Target Area	Kingskettle and Kettlebridge		Action ID	23802
Action Type	Community engagement			
Delivery Lead	Fife Council	Indicative Delivery	Ongoing	
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>			
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.			

Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.
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Freuchie (target area 288)

Summary	Location Map
<p>The village of Freuchie lies 6km north of Glenrothes within the Fife Council area. The main source of flooding in Freuchie is river flooding. There are approximately 50 people and 20 homes and businesses at risk from flooding.</p>	 <p>© Crown copyright. All rights reserved. SEPA lic. no. 100016991 (2020)</p> <p>(© Crown copyright and database rights 2022 OS 100023404)</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 assessment is the main source of information in this area. There are periodic records of flooding in this area, with floods occurring in October 2000 and August 2008 when the Freuchie Burn overflowed flooding homes and businesses. Recent flooding occurred in August 2020 when severe rainfall caused disruption to the community, property damage and impacts on the roads network.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
2881	Avoid flood risk	Avoid inappropriate development that increases flood risk in Freuchie
2882	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Freuchie
2883	Reduce flood risk	Reduce the risk of river flooding in Freuchie

Target Area	Freuchie	Action ID	28801
Action Type	Flood study		
Delivery Lead	Fife Council	Indicative Delivery	Completed financial year 2022-23
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>The cycle 1 natural flood management study is to be completed as planned. Current and long term flood risk should be considered, and high level appraisal of options undertaken.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

Target Area	Freuchie	Action ID	28802
Action Type	Community engagement		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.</p> <p>Community engagement should be carried out based on the findings of the flood studies in the area.</p>		
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.		

Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.
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PVA 02/07/15 (Auchtermuchty)

This area is designated as a potentially vulnerable area due to flood risk to Auchtermuchty and Dunshalt. The main source of risk is river flooding. There is some history of flooding in this 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.

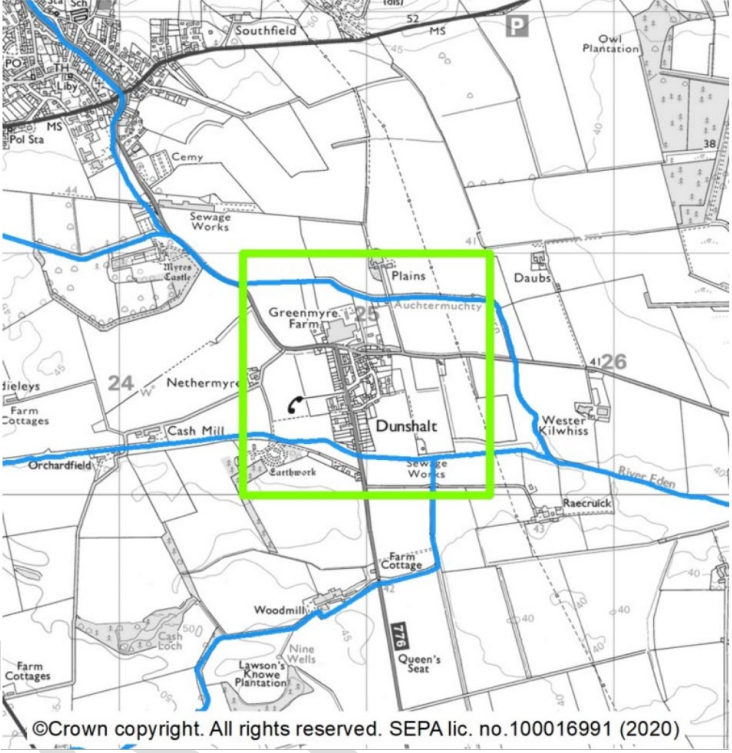
List of target areas

Dunshalt (target area 173)

Auchtermuchty (target Area 193)

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Dunshalt (target area 173)

Summary	Location Map
<p>The village of Dunshalt is located southeast of Auchtermuchty in Fife. The main source of flooding is river flooding. There are approximately 80 people and 60 homes and businesses currently at risk from flooding. This is likely to increase to 110 people and 80 homes and businesses by the 2080s due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404</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 for surface water flooding is improved by a sewer flood risk assessment. There are limited records of flooding in this area. In October 2002 prolonged rainfall caused flooding affecting homes and most recently in August 2020 the burn burst its banks and flooded the carriageway. The Dunshalt Village Flood Protection Scheme offers some protection against flooding in this area.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

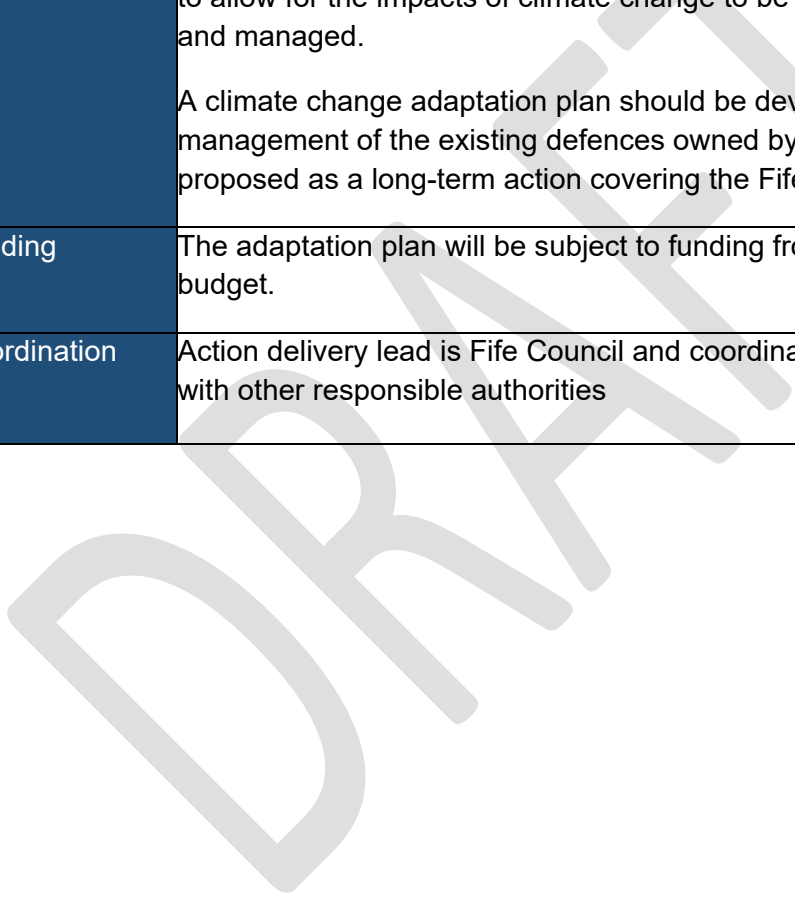
Objective ref	Objective type	Objective Description
1731	Avoid flood risk	Avoid inappropriate development that increases flood risk in Dunshalt
1732	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Dunshalt Flood Protection Scheme
1733	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Dunshalt
1734	Reduce flood risk	Reduce the risk of river flooding from the unnamed watercourse in Dunshalt

Target Area	Dunshalt	Action ID	17301
Action Type	Flood study		
Delivery Lead	Fife Council	Indicative Delivery	Completed financial year 2022-23
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>The scheduled natural flood management study should be carried out as planned. The existing flood protection scheme should be considered for all scenarios. Current and long term flood risk should be considered and how the existing flood protection scheme and the area will adapt to changes in flood risk due to climate change.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

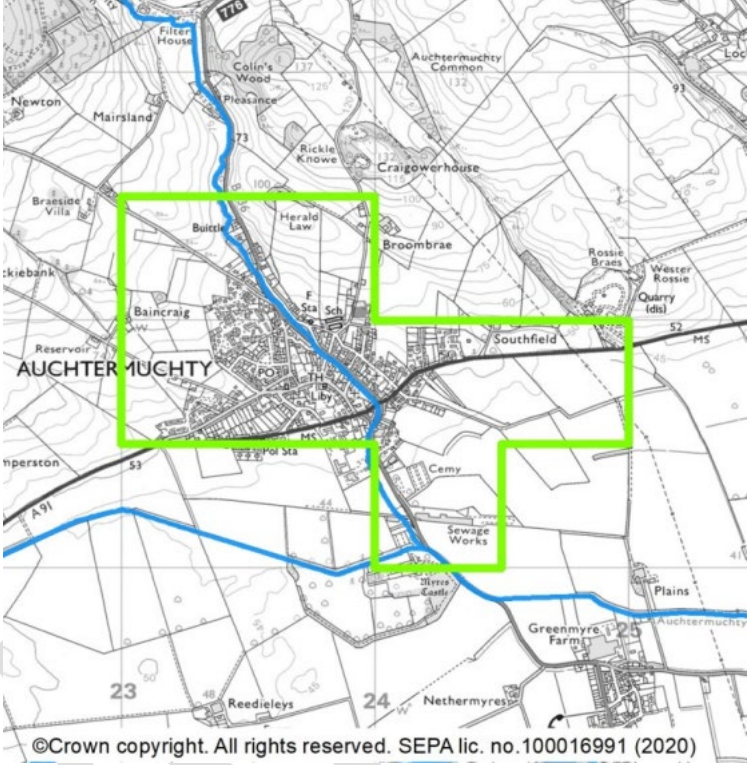
Target Area	Dunshalt	Action ID	17302
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance of the Dunshalt Village Flood Protection Scheme should continue and updates to the maintenance regime be made based on the findings of the flood study.</p>		

Funding	This will be funded from Fife Council's Revenue Budget
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities

Target Area	Dunshalt	Action ID	17303
Action Type	Adaptation plan		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A climate change adaptation plan should be developed in relation to management of the existing defences owned by Fife Council. This is proposed as a long-term action covering the Fife Council area.</p>		
Funding	The adaptation plan will be subject to funding from Fife Council's revenue budget.		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		



Auchtermuchty (target area 193)

Summary	Location Map
<p>The town of Auchtermuchty is located approximately 15km north of Glenrothes and within the Fife Council area. The main source of flooding is river flooding. The area has an existing flood protection scheme which offers some protection against river flooding. There are approximately 260 people and 160 homes and businesses at risk from flooding. This is estimated to increase to 270 people and 170 homes and businesses by 2080 due to climate change.</p>	 <p>© Crown copyright and database rights 2022 OS 100023404)</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 for surface water flooding is improved by a sewer flood risk assessment. There are periodic records of flooding in this area with flooding noted in January 1993 when a burn burst its banks inundating 22 homes and in July 2007 with flooding reported at 2 homes. The existing Auchtermuchty Flood Protection Scheme provides some protection against river flooding in this area.

What are the objectives and actions within this target area?

The objectives and actions for this target area are set out in the tables below.

SEPA and responsible authorities also carry out actions in all areas to manage current and future flood risk. A description of these actions is included in Section 2.2

Objective ref	Objective type	Objective Description
1931	Avoid flood risk	Avoid inappropriate development that increases flood risk in Auchtermuchty
1932	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Auchtermuchty Flood Protection Scheme
1933	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Auchtermuchty
1934	Reduce flood risk	Reduce the risk of river flooding from the Auchtermuchty Burn in Auchtermuchty

Target Area	Auchtermuchty		Action ID	19301
Action Type	Flood study			
Delivery Lead	Fife Council	Indicative Delivery	Completed financial year 2022-23	
Description	<p>An understanding of flood risk and associated issues in the area is to be developed, which may include surveys and modelling and should consider the impacts of climate change on flood risk.</p> <p>A flood study for Auchtermuchty is to start by December 2021. The study will include flood mapping and modelling and scoping of potential future actions to manage flood risk. A separate study will investigate potential for natural flood management and assess the performance of the existing flood protection scheme. Current and long term flood risk will be considered alongside climate change adaptation.</p>			
Funding	This will be funded from Fife Council's Revenue Budget			
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities			

Target Area	Auchtermuchty		Action ID	19302
Action Type	Community engagement			
Delivery Lead	Fife Council	Indicative Delivery	Ongoing	
Description	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.			

	Community engagement should be carried out based on the findings of the flood studies in the area.
Funding	Community engagement activities will be funded from local authority revenue budgets. SEPA's community engagement activities are funded by the Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by their economic regulator; all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.
Coordination	Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.

Target Area	Auchtermuchty	Action ID	19303
Action Type	Flood defence maintenance		
Delivery Lead	Fife Council	Indicative Delivery	Ongoing
Description	<p>The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.</p> <p>Maintenance to the Auchtermuchty Flood Protection Scheme should continue and updates to the maintenance regime should be made based on the findings of the flood study and adaptation plan.</p>		
Funding	This will be funded from Fife Council's Revenue Budget		
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities		

Target Area	Auchtermuchty	Action ID	19304
Action Type	Adaptation plan		
Delivery Lead	Fife Council	Indicative Delivery	2022-2028
Description	<p>Information on climate change is to be used to develop an adaptation plan to allow for the impacts of climate change to be monitored, understood and managed.</p> <p>A climate change adaptation plan is to be developed assessing the long-term management of the existing defences owned by Fife Council. This is proposed as a long-term action covering the Fife Council area.</p>		

Funding	The adaptation plan will be subject to funding from Fife Council's revenue budget.
Coordination	Action delivery lead is Fife Council and coordination will be undertaken with other responsible authorities

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3 Next Steps

3.1 Next Steps and Monitoring Progress

This Plan will run for six years from 2022. Over this period, the Tay Estuary and Montrose Basin 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 and actions arising will be considered by the Steering Group.

Between years two and three of the cycle (i.e. before December 2025), Angus 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), Angus 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.

Angus Council will make these reports available for public inspection.

4 Annexes

4.1 Tay Estuary and Montrose Basin LPD Roles, Responsibilities & Contact Details

Roles and responsibilities for Flood Risk Management Planning

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

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

Your Responsibilities

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

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

SEPA

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

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

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

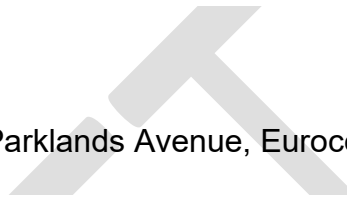
To raise awareness of flooding at a national level SEPA runs education initiatives, community engagement programmes and an annual campaign to promote the useful advice and information available through Floodline. We work in partnership with local authorities, Neighbourhood Watch Scotland, Ready Scotland and others to share our resources and help to promote preparedness and understanding of how flood risk is managed.

SEPA can be contacted as follows:

Telephone: 03000 99 66 99

E-mail: frmplanning@sepa.org

Address: Angus Smith Building, 6 Parklands Avenue, Eurocentral, Holytown, Motherwell, ML1 4WQ



Local Authorities

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

It is the responsibility of your local authority to implement its flood protection actions agreed within the Flood Risk Management Strategy, including new schemes or works and the requirement to carry out clearance and repair works on bodies of water. You can help your local authority to manage flooding by letting them know if debris is blocking watercourses or if flood defences are tampered with.

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

The lead authority for the Tay Estuary and Montrose Basin Local Plan District is Angus Council. Other local authorities who are responsible authorities for the Tay Local Plan District are:

- Aberdeenshire Council;
- Dundee City Council;
- Fife Council;
- Perth and Kinross Council

Contact details are provided below.

Local Authority	Telephone	E-mail	Address
Aberdeenshire Council	03456 08 12 08	roads@aberdeenshire.gov.uk	Woodhill House Westburn Road Aberdeen AB16 5GB
Angus Council	03452 777 778	roads@angus.gov.uk	Angus House Orchardbank Business Park, Forfar, Angus DD8 1AN
Dundee City Council	01382 434000	customerservices@dundeecity.gov	Dundee House 50 North Lindsay Street Dundee DD1 1QE
Fife Council	03451 550000	fife.council@fife.gov.uk	Fife Council Fife House, North Street, Glenrothes KY7 5LT
Perth & Kinross Council	01738 475000	Flood@pkc.gov.uk	Pullar House 35 Kinnoull Street Perth PH1 5GD

Scottish Water

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

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

Scottish Water can be contacted on 0800 0778 778.

National Parks

The Cairngorms National Park Authority is the Planning Authority for its area and was designated as a responsible authority for flood risk management purposes in 2012. They have worked with SEPA, local authorities and Scottish Water to help develop Flood Risk Management Strategies and Local Flood Risk Management Plans. As a planning authority they fulfil an important role in land use planning, carrying out or granting permission for activities that can play a key role in managing and reducing flood risk. The Cairngorms National Park Authority is a responsible authority within the Tay Estuary and Montrose Basin Local Plan District.

Contact details are provided below.

National Park Authority	Telephone	E-mail	Address
Cairngorms	01479 873 535	planning@cairngorms.co.uk	14 The Square, Grantown-on-Spey PH26 3HG

Other organisations

- The **Scottish Government** oversees the implementation of the Flood Risk Management (Scotland) Act 2009 which requires the production of Flood Risk Management Strategies and Local Flood Risk Management Plans. Scottish Ministers are responsible for setting the policy framework for how organisations collectively manage flooding in Scotland. The Scottish Government has also approved the Tay Flood Risk Management Strategy.
- **NatureScot** (formerly Scottish Natural Heritage (SNH)) has provided general and local advice in the development of the Flood Risk Management Strategies. Flooding is seen as a natural process that can maintain the features of interest at many designated sites, so Scottish Natural Heritage helps to ensure that any changes to patterns of flooding do not adversely affect the environment.

NatureScot also provides advice on the impact of Flood Protection Schemes and other land use development on designated sites and species.

- **Scottish Forestry and Forestry and Land Scotland** took over the roles of Forestry Commission Scotland in 2018 when the Forestry and Land Management (Scotland) Act 2018 came into force. While these executive agencies of Scottish Government are not formally designated as a responsible authority under the Flood Risk Management (Scotland) Act 2009, they support Scottish Government in delivering its flood risk related duties. This includes engaging in the development of the flood risk management plans through national and local advisory groups, Local Plan District partnerships, and collaborative projects. This reflects the widely held view that forestry can play a significant role in managing flooding. Contact details are as follows:

Scottish Forestry

Upper Battleby, Redgorton, Perth PH1 3EN

Phone: 0300 067 6005

Forestry and Land Scotland

Inverpark, Dunkeld PH8 0JR

Phone: 0300 067 6380

- During the preparation of the first flood risk management plans, **Network Rail** and **Transport Scotland** have undertaken works to address flooding at a number of frequently flooded sites. Further engagement is planned with SEPA and local authorities to identify areas of future work. There is the opportunity for further works to be undertaken during the second flood risk management planning cycle although locations for these works are yet to be confirmed.
- **Utility companies** have undertaken site specific flood risk studies for their primary assets and have management plans in place to mitigate the effects of flooding to their assets and minimise the impacts on customers.
- The **Met Office** provides a wide range of forecasts and weather warnings. SEPA and the Met Office work together through the [Scottish Flood Forecasting Service](#).
- The **emergency services** provide emergency relief when flooding occurs and can coordinate evacuations. You should call the emergency services on 999 if you are concerned about your safety or the safety of others and act immediately on any advice provided.
- **Historic Environment Scotland** considers flooding as part of their regular site assessments. As such, flooding is considered as one of the many factors which

inform the development and delivery of its management and maintenance programmes.

- **The Scottish Flood Forum** is a Scottish charitable organisation that provides support for those who are affected by, or are at risk of, flooding. It provides flood advice, information, awareness, education and training to individuals and communities to help reduce the risk of flooding; in partnership with the local authority, provides support during the recovery process following a flood incident and aims to support the development of resilient communities. The Scottish Flood Forum can be contacted as follows:

Tel: 0131 563 9392

Web: www.scottishfloodforum.org

Address: Caledonian Exchange, 19A Canning Street, Edinburgh, EH3

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4.2 Links to Schedules of Clearance and Repair

S18 Schedule of Clearance and Repair

The following are links for each local authority to access schedules of clearance and repair under Section 18 of the Flood Risk Management (Scotland) Act 2009:

Local Authority	Method of public access to the S18 Schedule	Hyperlink or web access
Aberdeenshire Council	Website	https://www.aberdeenshire.gov.uk/environment/flooding/flood-risk-management-scotland-act-2009/
Angus Council	Available on request	
Dundee City Council	Available on request	
Fife Council	Available on request	
Perth and Kinross Council	Website	http://www.pkc.gov.uk/article/14718/Flooding-duties-and-responsibilities

4.3 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.

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.

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4.4 Supporting Information

1. Sources of flooding described in the Strategy and this Plan

The Strategy and this Plan address the risk of flooding from rivers, the coast and surface water. The risk of flooding from rivers is usually due to rainfall causing a river to rise above bank level spreading out and inundating adjacent areas. Coastal flooding is where the risk is from the sea. Sea levels can change in response to tidal cycles or atmospheric conditions. Over the longer-term sea levels and coastal flood risk may change due to climate change. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead.

There can be interactions between these sources of flooding, but for the purposes of this Plan they are dealt with independently.

The following aspects of flooding have not been incorporated:

- **Groundwater** is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.
- **Reservoir breaches** have been assessed under separate legislation. Further information and maps can be found on SEPA's website.
- The Act does not include powers for SEPA or responsible authorities to assess or manage **coastal erosion**. SEPA has included consideration of erosion in the Strategy by identifying areas that are likely to be vulnerable to erosion and therefore where erosion can exacerbate flood risk. As part of considering where actions might deliver multiple benefits, SEPA has looked to see where the focus of coastal flood risk management studies coincides with areas of high susceptibility to coastal erosion. Subsequent detailed studies and scheme design will need to consider how coastal flood risk management actions interact with coastal erosion. Angus Council has a policy in relation to erosion whereby it may take action if erosion may substantially increase flood risk or its assets are at risk, which is described in the Shoreline Management Plan 2:

https://www.angus.gov.uk/the_environment/flooding_and_coastal_erosion/angus_shoreline_management_plan.

2. Understanding commonly used terms in flood risk management

Below are explanatory notes for the approach taken in this strategy and commonly used terms in flood risk management. A glossary of terms is also available.

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

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

- Annual Average Damages** have been used to assess the potential economic impact of flooding within an area. Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur. High likelihood events, which occur more regularly, contribute proportionally more to Annual Average Damages than rarer events. Within the Flood Risk Management Strategies Annual Average Damages incorporate economic damages to the following receptors: residential properties, non-residential

properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).

3. Flood Risk Management Planning Process

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

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

4. Identifying priority areas at significant flood risk

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

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

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

5. Improving the understanding of flooding

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

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

6. Identifying objectives and selecting actions

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

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

An assessment of the potential for natural flood management was used to help identify opportunities for using the land and coast to slow down and store water.

Natural flood management actions were recommended in areas where they could contribute to the management of flood risk. In such instances these actions were put forward as part of flood protection or natural flood management studies.

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4.5 Acknowledgements

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SEPA

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Local authorities

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Scottish Water

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