



Flood Risk Management Plan

Tay Estuary and Montrose Basin Local Plan District

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If you would like to contact us in writing, please mark any correspondence for the attention of FRM Planning and send to:

Scottish Environment Protection Agency
Angus Smith Building
6 Parklands Avenue
Eurocentral
Holytown
North Lanarkshire
ML1 4WQ

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Foreword

As we watch the news on TV or scan video clips on social media, we see much more regular violent weather. Bushfires of unprecedented size, ferocity and frequency happening in fire prone parts of the world and now happening where they were uncommon such as Siberia. Cyclones, tornadoes, heatwaves, droughts and, of course, as most affects Scotland - floods.

Anyone who has been in a flood area knows the intimidating terror it can bring. The foreboding that comes as people confront the potential damage or destruction of homes, businesses and other properties as well as injuries and, in the worst cases, loss of life.

This is all being made worse by the Climate Emergency. The recent COP26 meeting in Glasgow brought the world together to agree actions to do two things:

1. Reduce the emission of the greenhouse gases driving climate change, and
2. Help us adapt to the level of climate change that, despite our best efforts, is occurring.

The publication of this flood risk management plan is one of SEPA's key actions to help Scotland with this second aim.

As a society, we need to take action to manage the risk of flooding and its impacts on our lives, recognising that the risk can't ever be removed entirely. This plan takes our knowledge and understanding of flooding and the impacts of climate change and turns it into a set of actions that are planned, prioritised and co-ordinated to tackle flooding in the communities where it affects us the most.

Across Scotland, we now estimate that there are around 284,000 homes and businesses at risk of flooding. Our latest analysis shows that this could increase by around a further 110,000 homes and businesses if little or no action is taken to tackle climate change. Let's look at just one area of Scotland for an example of the local impact. Within the Tay Estuary and Montrose Basin Local Plan District it is estimated there are around 14,000 homes and businesses at risk from flooding, and this may increase to 19,000 homes and businesses by the 2080s due to climate change. All up, in this part of Scotland, there is a risk of river, surface water and coastal flooding and the expected annual cost of flooding is around £12.6 million.

So given the assessment undertaken, this plan:

- Describes the ambition for managing flooding and the priorities for action that we believe are most important and helps inform the development of local plans. A local flood risk management plan co-ordinated by Angus Council, provides additional detail on the responsibility for delivery, funding and coordination of actions across the Local Plan District. Taken together, these documents describe the commitment of responsible authorities to address flooding.
- Is published by SEPA and has been approved by Scottish Ministers. SEPA is just one organisation in the collective effort to manage flooding and this plan has been produced with the support and collaboration of Angus Council, four more local authorities, Cairngorms National Park Authority, Scottish Water and others with an interest in flood management. SEPA has taken account of the views received through a public consultation carried out during the development of the plan.
- Is based on the fact that how we plan for and manage our flood risk has far reaching consequences for Scotland's communities. The plans set the national direction of future flood risk management, helping to target investment and coordinate actions across public bodies. They explain what causes flooding in high-risk areas as well as the impacts when flooding does occur. This information is used as a basis for better decision-making across flood risk management organisations.

A lot of people, inside and outside SEPA, have contributed to the development of this plan. It underpins important decisions that will be made to protect people and property in Scotland from flooding and I hope that you find it valuable and useful.



Terry A'Hearn

Chief Executive

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Section 1: Flood risk management in Scotland

1.1 What is a flood risk management plan?

Flood risk management plans are Scotland's route map for reducing the effects of flooding on our communities. This is key to Scotland's 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.

Flood risk management plans have been designed to ensure effort to reduce flood risk in Scotland is coordinated. Many organisations are responsible for flood risk management and the plans focus 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 this plan.

There is a plan for each of the 14 flood risk management districts in Scotland, which are called Local Plan Districts. These plans set out the long term ambition for flood risk management. They set objectives for tackling flooding in high risk areas and identify the actions needed to work towards those objectives. These are agreed by the responsible authorities and are based on the best available evidence on the causes and consequences of flooding. The actions are described and prioritised in 6 year planning cycles.

These plans complement the separate local flood risk management plans published in 2022. The local flood risk management plans explain in more detail how the actions set out in this plan for 2022 to 2028 will be delivered. They are published by the local authority who is nominated as the lead local authority for the Local Plan District.

The plans replace the first flood risk management plans which were published in 2015. At the time they were called flood risk management strategies. The updated flood risk management plans continue to build on the risk-based, plan-led approach established in the 2015 strategies.

The flood risk management plans are published by SEPA as Scotland's strategic flood risk management authority and are approved by Scottish Ministers. They have been prepared in

collaboration with all 32 local authorities, Scottish Water and other organisations with a responsibility or interest in managing flooding. They have also been shaped in consultation with the public.

The flood risk management plans are required under the Flood Risk Management (Scotland) Act 2009 and will be updated every 6 years.

1.2 Managing flooding in Scotland

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 national 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: 2015-2021

The 2015 flood risk management strategies outlined the long term objectives to tackle flooding in the areas at highest risk.

In 2015 the objectives were split into two categories which were defined as:

- **Reduce overall flood risk:** to reduce the risk of flooding from all sources (river, sea and surface water) as far as reasonable, taking account of economic, environmental and social priorities.
- **Avoid an increase in flood risk:** to avoid increasing flood risk through land use planning and maintenance of existing flood management infrastructure.

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

As the first planning cycle ends, it is important to review the progress made in achieving these objectives. A summary is provided below. A full assessment will be published in 2022 by the lead local authorities and will provide progress on each of the actions.

The summary is based on data from the mid-cycle reports published by lead local authorities in 2019. The status of each action at that time was assessed, and reported 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.

In this summary, the action progress described in the 2019 mid-cycle reports is used to assess progress in delivering the avoid and reduce objectives.

a) Progress towards meeting the avoid objectives

90% of the actions set out in the strategies to avoid an increase in flood risk were green at the time of the mid-cycle report. 10% of the actions were amber. By 2021, 100% of the actions are expected to be complete.

b) Progress towards meeting the reduce objectives

84% of the actions described in the strategies to reduce flood risk were green at the time of the mid-cycle report, 12% of the actions were amber and 4% were red. With 96% of the actions completed or underway by 2021, the actions developed to meet the reduce objectives will mostly be achieved.

This summary confirms that significant progress has been achieved towards meeting the objectives set out in the 2015 strategies.

Progress made towards delivering the objectives was fully considered when developing the objectives and actions in these updated flood risk management plans.

1.2.2 Improving the understanding of flooding

Since publication of the 2015 flood risk management strategies, SEPA has continued to develop the flood hazard and risk maps. The hazard maps show information on the extent of flooding, and also on depth and velocity where that information is available. The flood risk maps provide detail on the impacts of flooding on people, the economy, cultural heritage and the environment.

Many actions included in the 2015 strategies, such as detailed flood studies improved understanding of flooding. This is an ongoing area of development and new information resulting from actions in these plans will be incorporated into future reviews of the understanding of flooding, to better inform decisions on flood risk management in the future.

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.

The flood hazard and risk maps and the assessment of the potential for natural flood management can be viewed on the SEPA website at

<https://www.sepa.org.uk/environment/water/flooding/flood-maps/>

1.2.3 National flood risk assessment

SEPA's flood hazard maps form the basis for the national flood risk assessment (NFRA). The NFRA provides the underpinning evidence for the risk-based approach in the flood risk management plans. SEPA published the second NFRA in 2018 which is available to view at <https://www.sepa.org.uk/data-visualisation/nfra2018/>.

To make best use of the data available and new techniques and information, there were several areas of improvement in the 2018 NFRA, building on the first NFRA published in 2011. The most significant change was in the representation of buildings. The 2011 NFRA represented buildings as single points. In 2018 the whole footprint of the building was used meaning buildings can be identified at flood risk even when only partially within the flood extent. Updated information on building locations, property type and the economic classification of buildings was also used to improve the assessment. These method updates resulted in a 3% increase in the number of homes and a 45% increase in the number of businesses being identified at flood risk in 2018.

Another development for the 2018 NFRA was to take account of how frequently flooding occurs. Different likelihoods of flooding were used to assess the effects on individual receptors. This allowed for the frequency of impacts to be considered as well as the severity of larger floods.

The 2018 NFRA also assessed social vulnerability to flooding and the resulting flood disadvantage. This is important as it becomes clear that climate change will impact vulnerable communities disproportionately and therefore this has been included in the evidence used to plan actions to manage flood risk in Scotland.

Finally, updated methods outlined in The Flood Hazard Research Centre's Multi-Coloured Manual and Multi-Coloured Handbook 2016 were also incorporated. They are the best available techniques for assessing the impacts of flooding and are used to produce information on the annual cost of flooding.

1.2.4 Climate change

The latest science on the effects of climate change predicts that parts of Scotland will experience wetter winters and more extreme weather events. Although summers might generally be drier there will be a greater risk of very intense rainfall. Sea levels are also expected to rise, and all these effects will lead to an increase in the frequency and severity of damaging floods.

In November 2020 SEPA published future flood maps showing the impacts of climate change on flooding in Scotland for the first time. The maps are based on the 2080s high emissions scenario and their development allowed significant advances in how climate change was assessed in the 2018 NFRA. This enabled climate change to be more fully built into the development of the flood risk management plans. The future flood maps are available to view at <https://map.sepa.org.uk/floodmaps>

Currently 284,000 homes, business and services are at risk of flooding from rivers, surface water and the sea. With the effects of climate change, an additional 110,000 homes, businesses and services are expected to become at risk across all sources of flooding in Scotland. Compared with the current level of flood risk, this represents a 90% increase in the number of properties at risk of coastal flooding, 40% increase in the number for river flooding and 25% for surface water flooding.

1.2.5 Potentially vulnerable areas (PVAs)

The 2018 NFRA was used to review the areas where flood risk is considered to be nationally significant. These are the areas with the greatest current or future flood risk. They are based on catchment areas, as it is only within the context of the wider contributing catchment that flooding can be best understood and managed. These nationally significant areas are referred to as Potentially Vulnerable Areas (PVAs) and are where the plans must deliver objectives and actions to manage flood risk.

A detailed manual review process was applied to the identification of PVAs to allow local knowledge from responsible authorities, communities, and any other supporting information to be considered.

SEPA engaged the public through a 3 month consultation on the PVAs, providing the opportunity for others to contribute to the assessment and to provide any additional information. As a result, amendments were made before the final 235 PVAs were agreed.

Around 90% of Scotland's flood risk is contained within PVAs. That means that not every location experiencing flood risk is included within a PVA, as PVAs are used to prioritise where the risk is highest, and benefits of flood risk management will be greatest. This plan includes national actions that apply across whole Local Plan Districts, including areas that are not within a PVA. The identification of the PVAs is reviewed every 6 years.

1.2.6 Identifying objectives and selecting actions

The objectives provide the long term vision for delivering flood risk management in Scotland, and the actions give the practical steps required to achieve those objectives.

A community perspective was used to identify where flood risk management actions should target their benefits. Those areas are described as target areas.

A whole catchment approach was then used to understand the flood risk and the steps needed towards managing the risk. Objectives and actions have been set for each target area within each PVA. National actions have also been identified, which apply across all Local Plan Districts including to areas that are not within PVAs.

Objectives were set by SEPA in collaboration with other flood risk management authorities and partners and follow a set of national principles designed to deliver sustainable flood management. The national principles are:

- Take a long term, risk-based approach to decisions, considering the impacts of climate change and how we will be able to adapt.
- Deliver coordinated management of flood risk by engaging with communities and working in partnership with others.
- Consider whole catchments and coastlines, working with natural processes and the environment to deliver multiple benefits.

These national principles sit alongside the more specific target area objectives.

The target area objectives fall into the following four categories in the 2021 plans:

- Avoid increasing flood risk
- Improve understanding of the flood risk
- Prepare for current flood risk and future flooding
- Reduce the risk of flooding

Actions are required to achieve the objectives set for each community. To identify the most sustainable actions, SEPA created a long list of all potential structural and non-structural actions. A decision framework was used to identify the most appropriate set of actions taking account of how well flood risk is currently understood in the area, what the scale of the risk is and whether the options meet the national principles set out above. Indicative costs for different types of action can be found in Annex 1.

The potential for natural flood management and blue-green infrastructure measures was explored in developing the most sustainable actions. However, these actions are not specifically noted as the need to consider such options is built into all actions for detailed flood studies, and all actions to appraise potential options for managing risk.

The overall long-term aim is to reduce the impact of flooding across Scotland as far as is reasonable, taking full account of environmental, economic, and social priorities and needs.

1.2.7 Catchment opportunities and constraints

Our natural landscape plays an important role in managing flood risk and consideration of the whole catchment is essential to sustainable flood risk management. This has informed our approach, which is to identify the wider contributing catchments and coastlines for all the areas where actions are targeted. The catchment perspective has also underpinned the selection of all the objectives and actions.

Taking this approach can reveal opportunities for natural flood management, as well as constraints to the options for managing flood risk. The latest available data on land cover, land use, geology, topography, hydrology, coastal processes, development planning and natural flood management was used to identify opportunities and constraints in the wider

contributing catchments of every target area. This information was used to support the decision framework for identifying actions. It will also inform the more detailed analysis of the opportunities in the catchment required for implementation of the actions. This is a core requirement of some of the actions identified, particularly where a detailed flood study or options appraisal is planned.

For coastal areas, a significant development in the information available on opportunities and constraints is the national coastal change assessment. This analysis includes past coastal erosion rates and makes projections for the future. On this basis we can take longer-term decisions for coastal management. More information is available at www.dynamiccoast.com

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 these plans and will be central to delivery of the objectives and actions they set out.

Strong relationships were developed through the first cycle of developing and delivering flood risk management strategies and local flood risk management plans. Building on that, the local partnerships established have worked throughout Scotland to develop this second set of flood risk management plans. SEPA has provided technical analysis and ensured a consistent national approach is taken, providing the evidence to make informed decisions. Local authorities, Scottish Water, other responsible authorities, and members of the local advisory groups have made significant contributions.

They have provided local knowledge, expertise and their 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 this 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 SEPA website, or the organisations listed.

a) 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 our 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 the [Floodline](#) website.

b) SEPA

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. SEPA work in partnership with the Met Office to forecast flooding and operate Floodline to warn the public and emergency responders when flooding is likely. SEPA produce 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 provide flood risk advice on land use planning when requested and raise awareness of flooding at a national level through education initiatives, community engagement and campaigns.

c) 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.

d) 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.

e) 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.

f) 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 Ministers have also approved this flood risk management plan.

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.

1.3.4 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. Two public consultations have been held during the development of the flood risk management plans. The first by SEPA was on the national flood risk assessment and the identification of PVAs (2018); the second, held jointly with local authorities, was on the understanding of flooding in these priority areas and on the objectives and actions to manage flooding (2021).

The second, most recent consultation ran from December 2020 to October 2021 in 2 parts. From December 2020, information on the Local Plan Districts, the PVAs and the communities identified as target areas was made available. Further information on the objectives and actions planned for each target area was added in July 2021. The consultation was advertised widely by both SEPA and the local authorities. 678 responses were received, and these helped shape the content of this plan. More information on the consultation and the responses SEPA has received is provided in **Annex 2**.

As this was a joint consultation, the responses were shared with local authorities who further considered all the submissions for the purpose of shaping the local flood risk management plans published in 2022. A summary of the consultation was submitted to Scottish Ministers along with this plan, and a more detailed report on what contributors said and what SEPA did in response will be available on SEPA's website from March 2022.

In addition to the consultation, advice has been sought from relevant organisations at key stages. The plans have benefited from local advisory groups who have provided important community and area-based knowledge. This informed understanding of the causes and consequences of flooding and the appropriate actions for future management. Local advisory groups have been especially helpful in considering flood risk management in the context of wider plans and initiatives. The groups include representatives from a range of sectors, including government agencies like Transport Scotland, National Park Authorities, local authorities, non-government organisations, utility companies and land and asset managers.

Community based groups are key to planning for, responding to, and recovering from flooding. Communities have engaged through the consultation on these plans and will be consulted on more detailed information on the implementation of many of the specific actions. The local information provided on their experience of flooding has shaped the identification of PVAs and informed decision making on the objectives and actions.

In producing the flood risk management plans, SEPA has also taken advice from a National Flood Management Advisory Group. Over 50 member organisations have been invited at key stages to provide comment and input, reflecting the national importance and impact of flooding on our communities, economy, environment and cultural heritage.

Some of the work carried out by SEPA has been complex and technical in nature for which we have sought professional advice. Through membership of the Scottish Advisory and Implementation Forum for Flooding (SAIFF), SEPA has received assistance from local authorities, Scottish Water, Scottish Forestry, the National Park Authorities and other key interested organisations. SEPA has also developed some of its methods by working with other organisations with similar responsibilities within the UK and Europe, more specifically with the Environment Agency and English local authorities in the cross border areas.

1.3.5 Strategic Environmental Assessment and Habitats Regulation Appraisal

SEPA undertook a strategic environmental assessment to assess the significant environmental effects of the flood risk management plans. This assessment was published in an environmental report, and SEPA consulted with the public on the findings.

A statement will be published detailing how SEPA have taken account of the environmental assessment and the consultation responses, and how any significant environmental effects from the flood risk management plans will be monitored. SEPA also undertook a Habitats Regulations Appraisal to ensure that the flood risk management plans will not adversely affect the integrity of Special Areas of Conservation, Special Protection Areas and Ramsar Sites. SEPA consulted NatureScot on the appraisal method and took their views into account. Mitigation measures have been applied where required.

1.4 Links with other plans and policies

1.4.1 River basin management planning

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

1.4.2 Land use and spatial planning

Land use planning decisions are one of the most powerful tools available to manage flood risk, and the alignment of flood risk management and land use planning policy is pivotal to achieving sustainable flood risk management. Decisions relating to flood risk management can have significant implications for the location of development and, likewise, decisions relating to the location of development can impact on flood risk. Flood risk management plans must take account of local development plans relating to the district, and the need for development plans to take account of flood risk management plans is included in the Town

and Country Planning (Development Planning) (Scotland) Regulations 2008 (as amended 2011). SEPA is a key agency in the land use planning process with a duty to cooperate with planning authorities in the preparation of development plans and a statutory role to provide flood advice for appropriate development management applications. The advice we give seeks to promote flood avoidance. In addition, land use planning objectives and actions have been agreed with responsible authorities, which will ensure flood risk is adequately considered in local planning decisions.

1.4.3 Emergency planning and response

Many organisations across Scotland, 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, ensuring the effective management of response to emergencies. 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.

1.4.4 Scottish Water investment plans

There is a close relationship between 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.

1.5 Next steps and monitoring progress

Flood risk management planning has progressed significantly in recent years. Scotland now has the most advanced, nationally consistent and locally informed understanding of the causes and consequences of flooding that it has ever had. Key partnerships have been developed and the plan-led approach has been strongly established through the first set of strategies and local flood risk management plans. SEPA and the other responsible authorities are committed to continuing 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. Lead local authorities will publish the local flood risk management plans in 2022 with greater detail on the scope of the actions identified in this plan and how they will be funded, coordinated and delivered between 2022 and 2028.

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 flood risk management actions

SEPA has carried out a national prioritisation exercise based on the best available understanding of flood risk and the capacity of lead organisations to deliver actions. Funding for flood risk management actions typically come either directly from the lead organisations or as happened in 2016, through an allocation of capital grant from the Scottish Government. However, funding can be procured from other sources.

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 flood risk management plans 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.

A decision on grant funding is expected in time for the publication of the local flood risk management plans. As a result, there may be changes to the detail of actions, or the ability to deliver actions in the identified timescales, compared with this plan. 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 of Scotland. The delivery of the plan, particularly the ambitions on how quickly actions can be delivered, may have to be adapted to reflect wider developments in public funding, the ability of responsible authorities to access funding from other sources, pandemic recovery, and other national priorities.

1.5.2 Licensing acknowledgements

Full data licensing acknowledgements can be found in **Annex 3** of this plan.

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.

1.6 Supporting information

1.6.1 Sources of flooding described in this plan

This flood risk management plan targets the risk of flooding from rivers, the coast, surface water and groundwater. The risk of flooding from rivers is usually due to heavy or prolonged rainfall causing a river to rise above the top of the bank. Water spreads out and floods nearby areas. Coastal flooding is where the risk is from the sea. Sea levels can be higher than usual due to normal tidal cycles or stormy weather systems. Over the longer term, sea levels and coastal flood risk will increase due to climate change. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground. Instead, it collects or flows over the ground. There can be interactions between these sources of flooding.

Groundwater is usually a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs. Actions to directly target groundwater are quite limited in this plan. However, susceptibility to the contributing effects of groundwater on flooding was considered everywhere in the national flood risk assessment which underpins this plan. Maps of areas where groundwater can contribute to flood risk are available to view on our website: <https://map.sepa.org.uk/floodmap/map.htm>

1.6.2 The following aspects of flooding have not been incorporated into this plan:

Reservoir breaches have been assessed under separate legislation (Reservoirs (Scotland) Act 2011) and so flood risk from reservoir breach is not considered in this plan. There are fundamental differences in probability of flooding and associated management actions for reservoirs. Further information and maps can be found on SEPA's website:

www.sepa.org.uk/regulations/water/reservoirs/

The Flood Risk Management (Scotland) Act 2009 does not require SEPA or responsible authorities to assess or manage coastal erosion. However, SEPA has included consideration of coastal erosion in the flood risk management plans by identifying areas that are likely to be susceptible to erosion and where erosion can exacerbate flood risk.

As part of considering where actions might deliver multiple benefits, SEPA have looked to see where the focus of coastal flood risk management studies coincides with areas at risk of coastal erosion as identified by the Dynamic Coast project. Subsequent detailed flood studies and scheme design will need to consider coastal erosion in these areas. This includes ensuring that actions to manage flood risk do not contribute to increased coastal erosion and where appropriate, help to manage risks from coastal erosion now and in the future.

The information on coastal flooding used to set objectives and identify actions is based in most areas on SEPA modelling using simplified coastal processes and flooding mechanisms. As a result, coastal flood risk may be underestimated in some areas and overestimated in others. Where more detailed local models were available from flood studies or from flood warning schemes, these have been incorporated into the development of the flood risk management plans, as have other sources of local information such as records of past flooding. SEPA is currently working on updates to the national coastal flood mapping to better represent the effects of waves. Actions in the plans reflect the best information currently available.

1.6.3 Commonly used terms

Below are explanatory notes for commonly used terms in this plan. A glossary of terms is also available at the end of this document.

Reference to flood risk. To develop this plan, flood risk has been assessed over a range of likelihoods. For consistency in reporting information, unless otherwise stated, all references to properties or other receptors being ‘at risk of flooding’ refer to a medium likelihood flood (up to a 0.5% 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 10% chance/likelihood or 0.1% chance/likelihood of flooding in any given year respectively.

Chance / likelihood of flooding		
Likelihood	Return Period	Annual chance
High	1 in 10 year	10%
Medium	1 in 200 year	0.5%
Low	1 in 1000 year	0.1%

An **annual cost of flooding** is given as an assessment of the 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 many years. It does not mean that value of damage will occur every year: in many years there will be no damages and in some years the damages will be minor. In most places, there will be a very small number of years when much bigger floods occur, and that is when the highest damage costs will occur. To assess the annual cost, this is averaged over many years. In some areas, smaller floods which happen frequently contribute more to the annual cost than much larger events which are rarer. Within the plans, the annual cost of flooding has been calculated based on the methods set out in the Flood Hazard Research Centre's Multi-Coloured Handbook (2016).

History of flooding. Where the plans refer to a history of past flooding, flood events up to 2019/20 have been taken into account.

Section 2: Tay Estuary and Montrose Basin Local Plan District (LPD 7)

Flood risk management plan 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.

SEPA lead development of the flood risk management plans for Scotland and delivery of flood warning services. Local flood risk management planning in the Tay Estuary and Montrose Local Plan District is led by the Angus Council, who are the lead local authority. Other responsible authorities include Scottish Water, four more local authorities and the Cairngorms National Park Authority. They are supported by Scottish Government agencies including Forestry and Land Scotland, Scottish Forestry and Transport Scotland.

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

2.2 Actions across the Local Plan District

SEPA and 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>

	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>

	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>

	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. As the flood warning authority for Scotland SEPA continues to provide its flood warning service issuing flood alerts and warnings when required, giving people a better chance of reducing the impact of flooding on their home or business.</p>

	Flood warning development framework
Action	<p>SEPA will publish a new flood warning development framework by March 2022, which will detail its ambitions and strategic actions to maintain and improve our flood warning service across Scotland.</p> <p>SEPA will continue to develop the Scottish Flood Forecast, a 3 day forecast of flood risk across Scotland and bring together all live information such as flood warnings, river levels and rainfall data into a central hub 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 forecast with improved lead time.</p>

	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.</p> <p>We will plan for a better future by publishing our flooding services strategy in 2022 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>

	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>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>
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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:</p> <p>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.</p>

	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 drainage and the minimisation of impermeable surfaces.</p>

	Locally determined planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.
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	Maintenance
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>

	Natural flood management mapping
Action	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. In addition to flooding benefits, natural flood management measures can also provide many additional benefits to biodiversity, water quality, recreation, and carbon storage.

	National flood risk assessment
Action	Understanding the future impacts of climate change remains a central theme of SEPA's flood risk management activity. SEPA will use the latest UK information on climate change to support an improved understanding of the changes in flood risk across the 21st century. SEPA will use the most suitable data to develop the national flood risk assessment (NFRA) 2024. This assessment will be used to identify future potentially vulnerable areas.

	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.

	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.

	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.
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	Self help
Action	<p>Everyone is responsible for protecting themselves and their property from flooding. People can take steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property flood resilience measures, signing up to Floodline, engaging with their local flood group, and ensuring that properties and businesses are insured against flood damage. The following places offer help with taking steps to protect yourself:</p> <p>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>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>

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

2.3 Potentially vulnerable areas

Potentially vulnerable areas (PVAs) were designated in 2018 based on the potential current or future risk from all sources of flooding. This designation was informed by the national flood risk assessment (available to view at: <https://www.sepa.org.uk/data-visualisation/nfra2018/>). As part of continued analysis of flood risk, the national flood risk assessment and potentially vulnerable areas (PVA) will be reviewed every 6 years to take on board any new information. There are 15 potentially vulnerable areas (PVA) within this Local Plan District. Following sections provide more information on these areas.

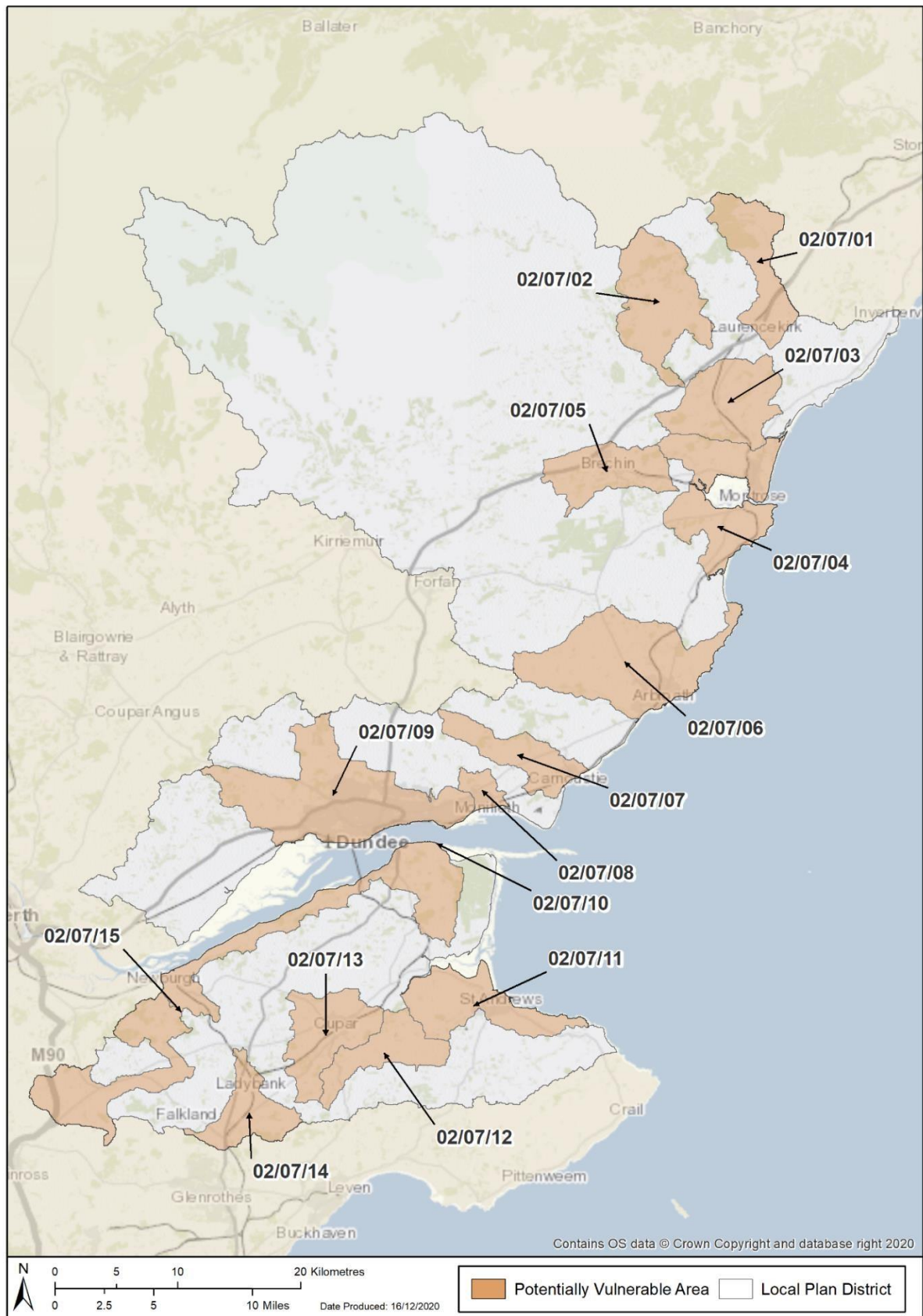


Figure 1. Potentially vulnerable areas in Tay Estuary and Montrose Basin Local Plan District

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	Page number
02/07/01	Auchenblae	Aberdeenshire	34
02/07/02	Fettercairn	Aberdeenshire	37
02/07/03	Marykirk	Aberdeenshire	40
02/07/04	Montrose Basin	Angus	43
02/07/05	Brechin	Angus	47
02/07/06	Arbroath	Angus	51
02/07/07	Carnoustie, Barry	Angus	56
02/07/08	Monifieth	Angus	60
02/07/09	Dundee, Broughty Ferry and Invergowrie	Dundee City, Perth & Kinross	65
02/07/10	Newburgh	Fife	77
02/07/11	St Andrews	Fife	81
02/07/12	Pitscottie	Fife	85
02/07/13	Cupar and Springfield	Fife	90
02/07/14	Kingskettle and Kettlebridge	Fife	96
02/07/15	Auchtermuchty	Fife	101

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

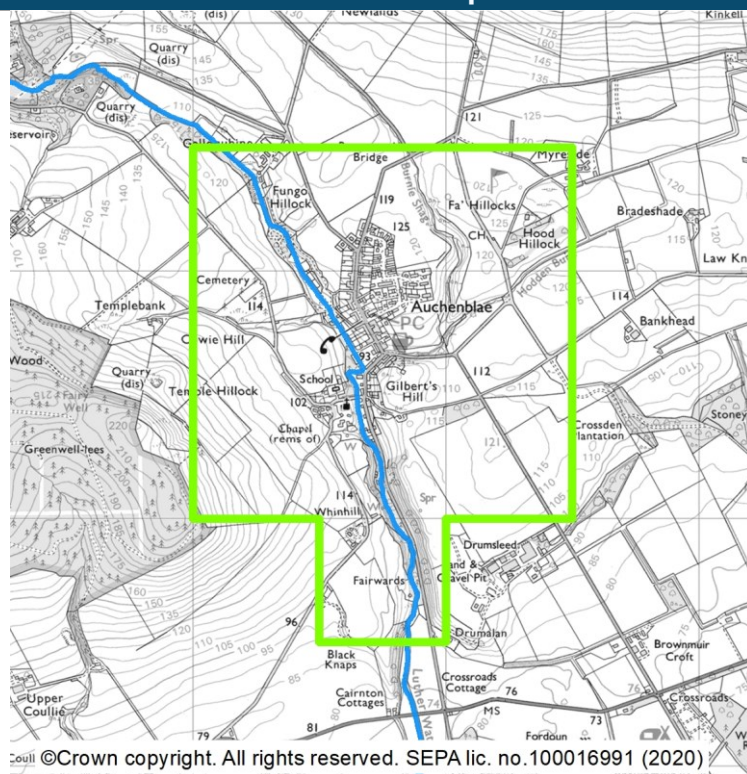
Auchenblae (target area 192)

Auchenblae (target area 192)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources, and this national assessment has highlighted the risk of flooding in this target area. There are limited records of flooding in the Auchenblae target area.

What are the objectives for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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.

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood risk management review (Ref: 19201)	
Action	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.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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 Crichie 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

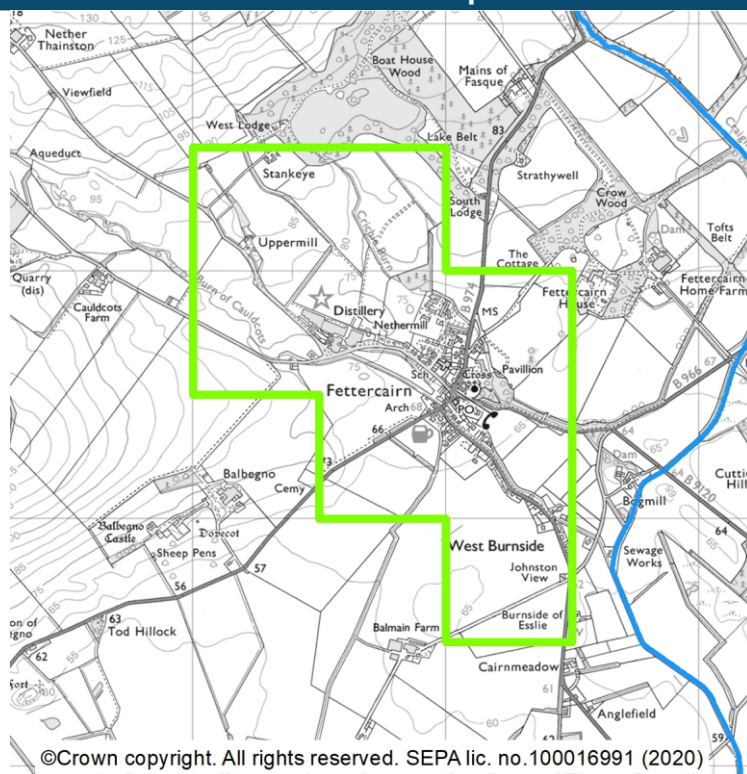
Fettercairn (target area 272)

Fettercairn (target area 272)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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.

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 27201)	
Action	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.
Description	<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>
Flood defence maintenance (Ref: 27202)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

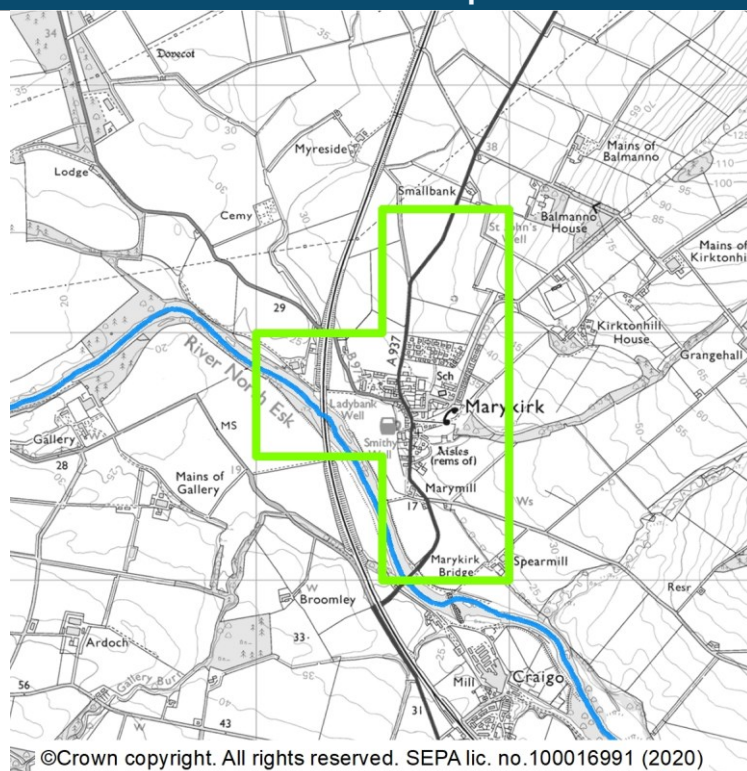
Marykirk (target area 174)

Marykirk (target area 174)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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.

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood warning maintenance (Ref: 17401)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the River North Esk flood warning scheme.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

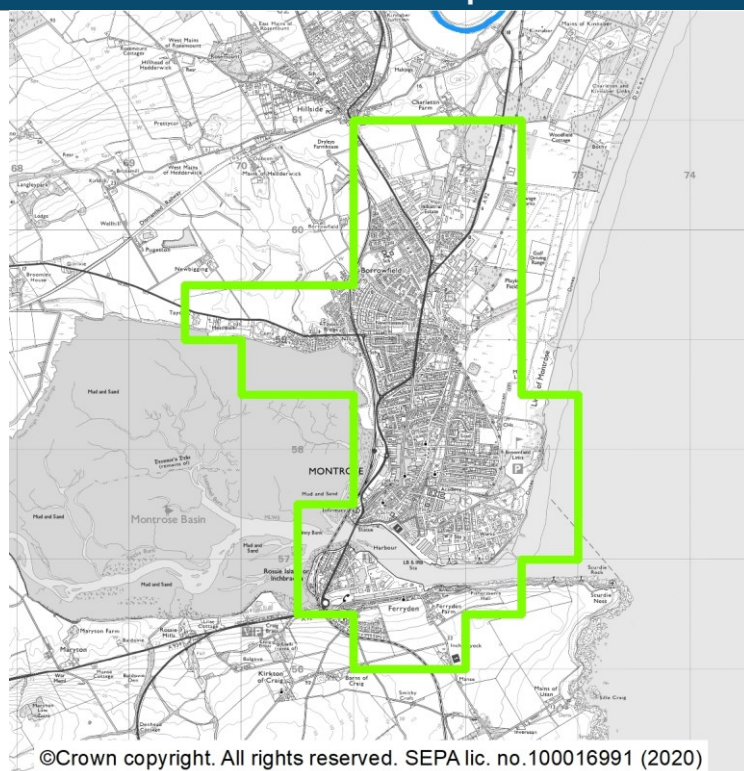
Montrose and Ferryden (target area 251)

Montrose and Ferryden (target area 251)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works design (Ref: 25101)	
Action	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.
Description	<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>2 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 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>

Catchment/coastal management implementation (Ref: 25102)	
Action	Improvements to catchment or coastal management are to be implemented following agreement of the design, costs and timescales.
Description	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.

Adaptation plan (Ref: 25103)	
Action	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.
Description	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.
Surface water management plan (Ref: 25104)	
Action	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 over-whelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.
Description	<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> <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>
Flood warning maintenance (Ref: 25105)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Aberdeenshire and Angus coastal flood warning scheme.
Strategic mapping improvements (Ref: 25106)	
Action	SEPA will continue to update flood maps based on new information.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

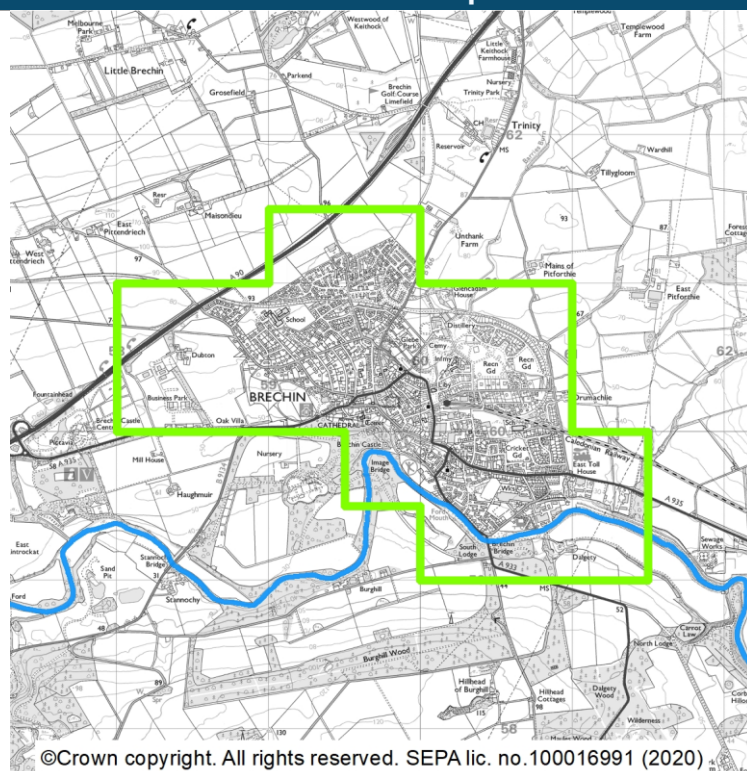
Brechin (target area 203)

Brechin (target area 203)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Catchment/coastal management implementation (Ref: 20301)	
Action	Improvements to catchment or coastal management are to be implemented following agreement of the design, costs and timescales.
Description	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.
Sewer flood risk assessment (Ref: 20302)	
Action	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
Description	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.
Surface water management plan (Ref: 20303)	
Action	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.
Description	<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. 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>

Adaptation plan (Ref: 20304)	
Action	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.
Description	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.

Community engagement (Ref: 20305)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.

Flood defence maintenance (Ref: 20306)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Angus Council will develop a formal maintenance programme for the scheme. 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.

Flood warning maintenance (Ref: 20307)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the South Esk flood warning scheme.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

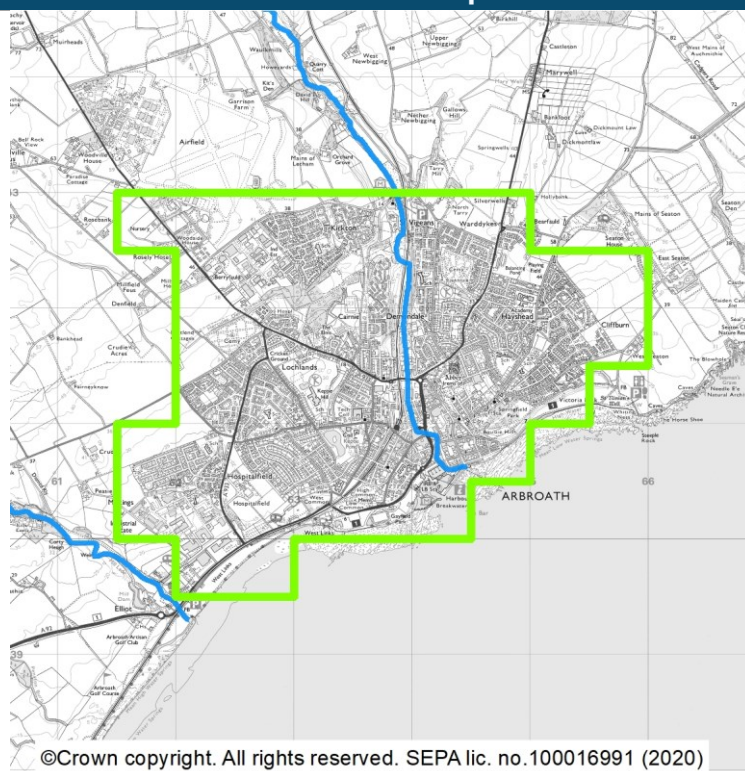
Arbroath (target area 190)

Arbroath (target area 190)

Summary

Arbroath lies on the North Sea coast within the Angus Council area. This target area also include the small village of St Vigeans. 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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.

- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works implementation (Ref: 19001)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	The construction of the Arbroath (Brothock Water) Flood Protection Scheme has commenced and is due to be completed in 2023. 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.
Flood defence maintenance (Ref: 19002)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.
Flood study (options appraisal) (Ref: 19003)	
Action	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.
Description	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.

Surface water management plan (Ref: 19004)	
Action	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.
Description	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. The integrated catchment study led by Scottish Water will continue as planned to address complex surface water and sewer flood risk and interaction with small/culverted watercourses.
Sewer flood risk assessment (Ref: 19005)	
Action	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
Description	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.
Flood study (Ref: 19006)	
Action	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.
Description	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.
Adaptation plan (Ref: 19007)	
Action	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.
Description	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.
Shoreline management plan (coastal adaptive plan) (Ref: 19008)	
Action	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.
Description	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.
Community engagement (Ref: 19009)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.

Flood warning maintenance (Ref: 19010)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Brothock Water flood warning scheme.

Flood warning maintenance (Ref: 19011)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

Strategic mapping improvements (Ref: 19012)	
Action	SEPA will continue to update flood maps based on new information.
Description	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.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Flood warning maintenance (Ref: 19013)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should investigate improvements to the Brothock Water flood warning scheme.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

Coordination with the river basin management plan

This area has been identified as having potential for restoration in Scotland's river basin management plan. Actions should be coordinated to deliver any potential joint objectives for restoration and flood risk management. This should be considered in the earliest stages of any projects.

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

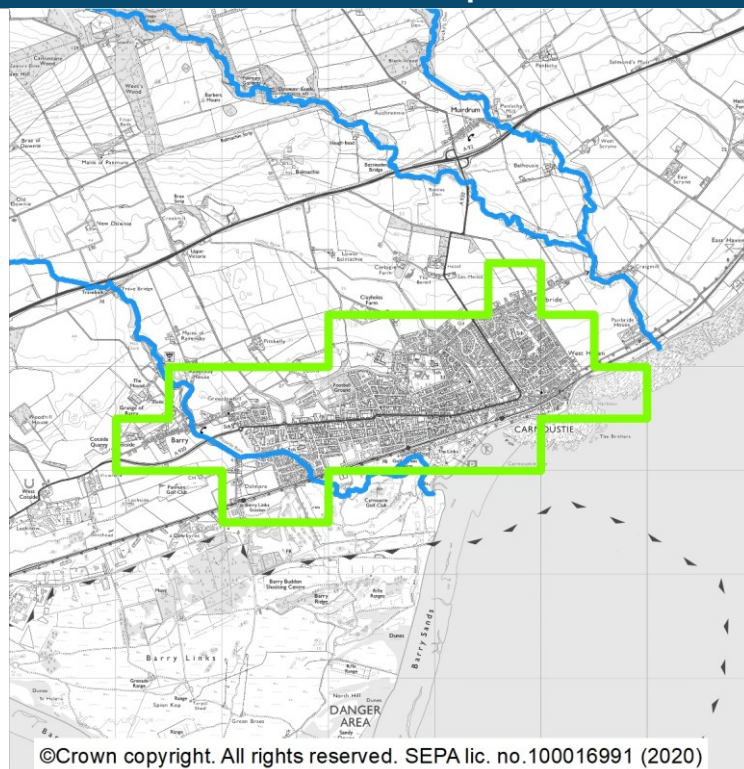
Carnoustie (target area 210)

Carnoustie (target area 210)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works design (Ref: 21001)	
Action	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.
Description	<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>

Flood defence maintenance (Ref: 21002)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.

Adaptation plan (Ref: 21003)	
Action	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.
Description	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.

Shoreline management plan (coastal adaptive plan) (Ref: 21004)	
Action	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.
Description	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.
Community engagement (Ref: 21005)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.
Sewer flood risk assessment (Ref: 21006)	
Action	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
Description	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.
Surface water management plan (Ref: 21007)	
Action	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 over-whelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

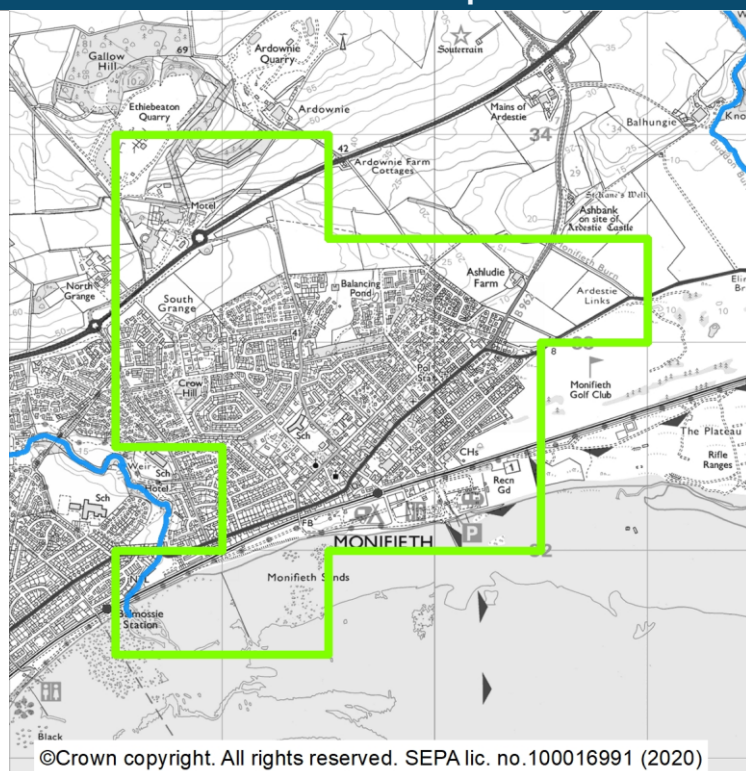
Monifieth (target area 250)

Monifieth (target area 250)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 25001)	
Action	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.
Description	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.

Flood scheme or works design (Ref: 25002)	
Action	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.
Description	<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> <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>

Flood scheme or works design (Ref: 25003)	
Action	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.
Description	<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 Ramsar Site and the Outer Firth of Forth and St Andrews Bay Complex Special Protection Area.</p>

Shoreline management plan (coastal adaptive plan) (Ref: 25004)	
Action	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.
Description	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.

Sewer flood risk assessment (Ref: 25005)	
Action	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
Description	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.

Surface water management plan (Ref: 25006)	
Action	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 over-whelmed drainage systems have been identified and should be implemented. The Plan is to be reviewed and updated as needed.
Description	<p>Angus Council will continue to develop and where funding allows implement the Angus wide surface water management plan, which includes Monifieth. The surface water management plan identifies areas most at risk from surface water flooding in Monifieth and identifies options that could alleviate this risk. 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>

Adaptation plan (Ref: 25007)	
Action	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.
Description	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.
Community engagement (Ref: 25008)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.
Flood defence maintenance (Ref: 25009)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.
Flood warning maintenance (Ref: 25010)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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)

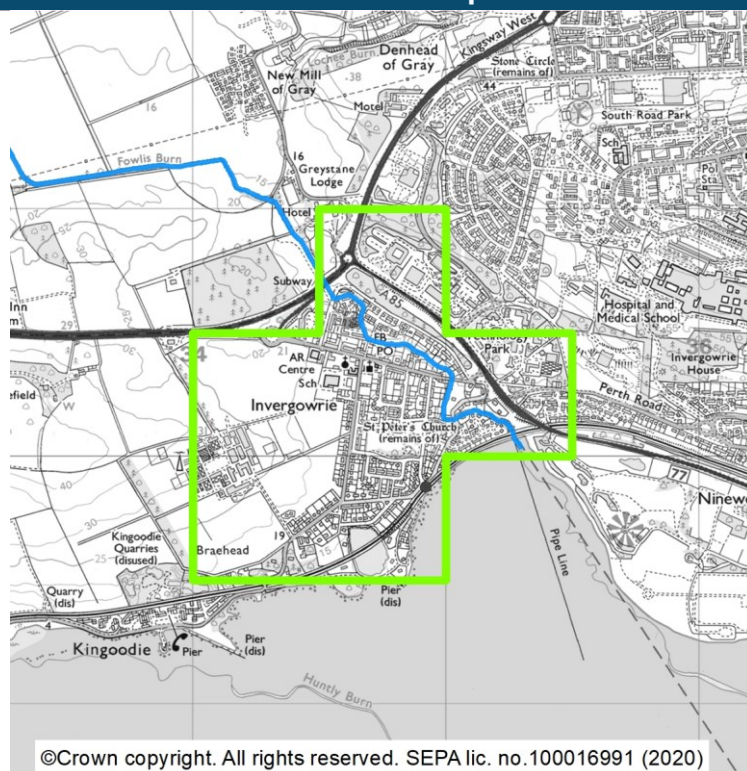
Flood risk management plan datasheet

Invergowrie (target area 235)

Summary

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. An on-going natural flood management flood study carried out by the local authority indicates that there are approximately 10 homes and businesses currently at risk of flooding and that this is likely to increase to 18 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national assessments of flooding from rivers, surface water and coastal sources. The national assessment is improved for surface water flooding 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.

- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 23501)	
Action	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.
Description	A natural flood management study for the Invergowrie Burn was included in the current Tay Local Flood Risk Management Plan. The study is underway and is being carried out as planned. The study is considering current and future flood risk and the potential impacts of climate change.
Sewer flood risk assessment (Ref: 23502)	
Action	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
Description	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.
Community engagement (Ref: 23503)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement will continue in connection with ongoing projects and activities.

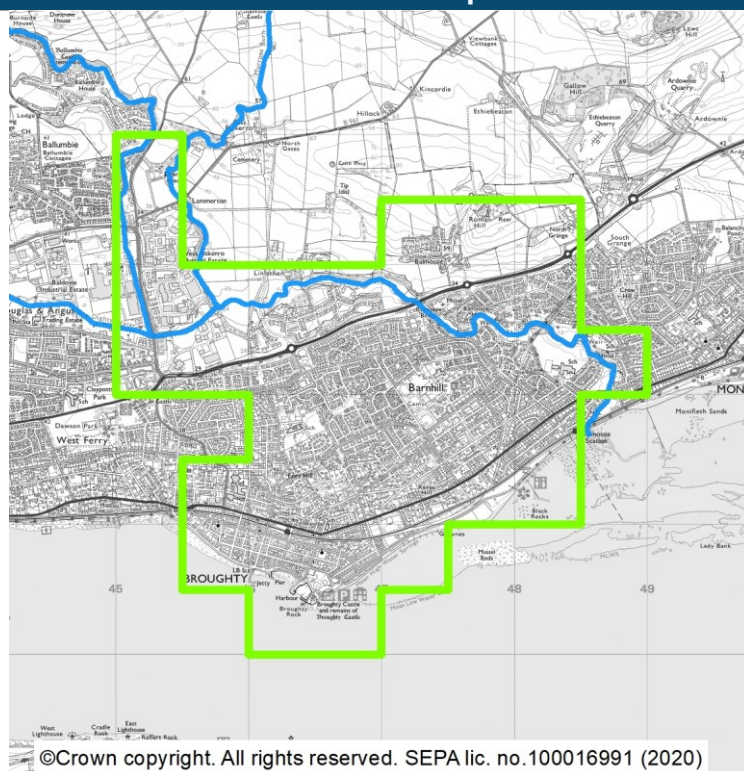
SEPA and responsible authorities carry out actions in all areas which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. A description of these actions is included in the Local Plan District section at the start of this document.

Broughty Ferry (target area 269)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works implementation (Ref: 26901)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	The Broughty Ferry (coastal) Flood Protection Scheme is under construction and programmed for completion in summer 2022. The impact of climate change should be further considered and information developed should form the basis of an adaption plan.
Flood defence maintenance (Ref: 26902)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Once the Broughty Ferry (coastal) Flood Protection scheme is completed, Dundee City Council should start the scheme inspection and maintenance programme. 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. 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. 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.

Flood scheme or works design (Ref: 26903)	
Action	The selected preferred approach for managing river flood risk 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.
Description	<p>A river flood protection study was carried out in this location that recommended a river flood scheme to manage flood risk from 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.</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>

Flood scheme or works implementation (Ref: 26904)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	<p>The responsible authority proposes this action as the best option for managing river flood risk in this community. The delivery of this action is subject to funding being made available.</p> <p>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>

Sewer flood risk assessment (Ref: 26905)	
Action	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
Description	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.

Surface water management plan (Ref: 26906)	
Action	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.
Description	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.

Community engagement (Ref: 26907)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.
Land use planning (Ref: 26908)	
Action	Planning authority should ensure that their development plan and planning decision-making supports delivery of sustainable flood management.
Description	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.
Flood warning maintenance (Ref: 26909)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

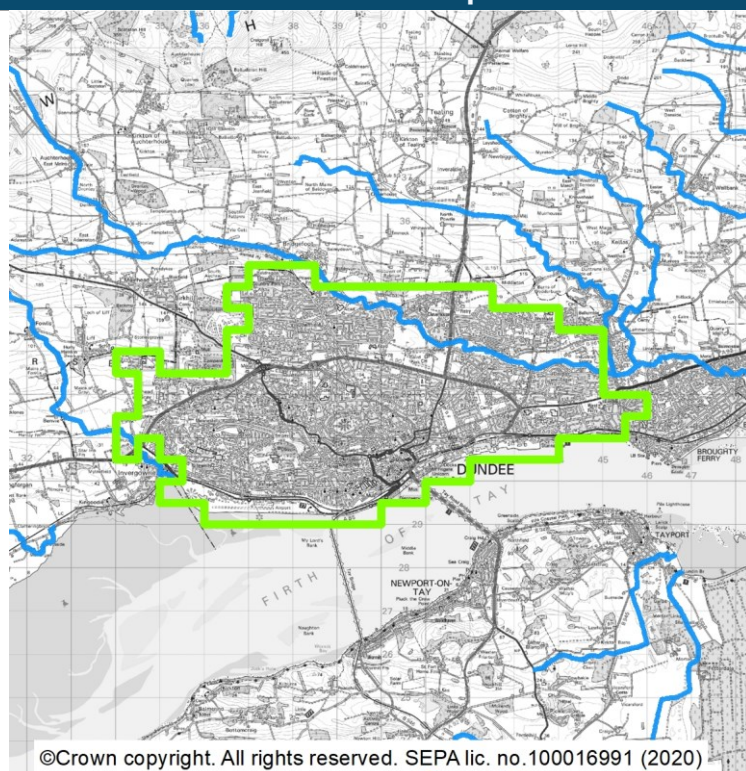
SEPA and responsible authorities carry out actions in all areas which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. A description of these actions is included in the Local Plan District section at the start of this document.

Dundee (target area 270)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works design (Ref: 27001)	
Action	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.
Description	<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.</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>

Flood scheme or works implementation (Ref: 27002)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	<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>

Flood defence maintenance (Ref: 27003)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Dundee City Council should continue to maintain the Dundee (coastal) Flood Protection Scheme by undertaking programmed and reactive maintenance.

Flood scheme or works design (Ref: 27004)	
Action	The selected preferred approach for managing river flood risk 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.
Description	<p>A river flood protection study 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>

Flood scheme or works implementation (Ref: 27005)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	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. 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.

Flood scheme or works design (Ref: 27006)	
Action	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.
Description	<p>The joint 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 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>
Sewer flood risk assessment (Ref: 27007)	
Action	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
Description	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.
Surface water management plan (Ref: 27008)	
Action	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.
Description	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.
Community engagement (Ref: 27009)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	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.
Flood warning maintenance (Ref: 27010)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

Strategic mapping improvements (Ref: 27011)	
Action	SEPA will continue to update flood maps based on new information.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

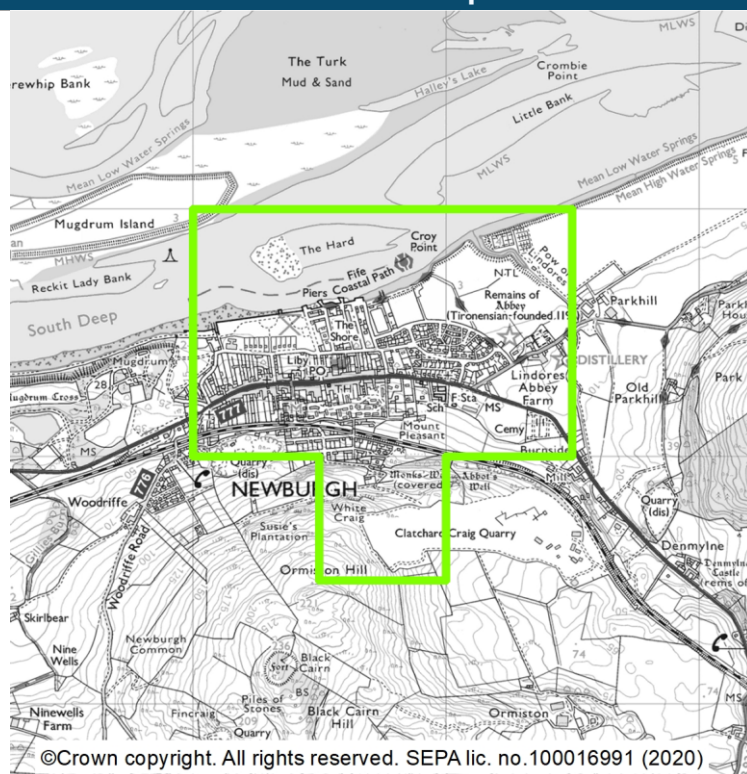
(target area 252)

Newburgh (target area 252)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Shoreline management plan (coastal adaptive plan) (Ref: 25201)	
Action	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.
Description	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.
Strategic mapping improvements (Ref: 25202)	
Action	SEPA will continue to update flood maps based on new information.
Description	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.
Community engagement (Ref: 25203)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.
Flood defence maintenance (Ref: 25204)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Asset owners should continue to maintain the existing coastal defences.
Flood warning maintenance (Ref: 25205)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Flood study (options appraisal) (Ref: 25206)	
Action	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.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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)

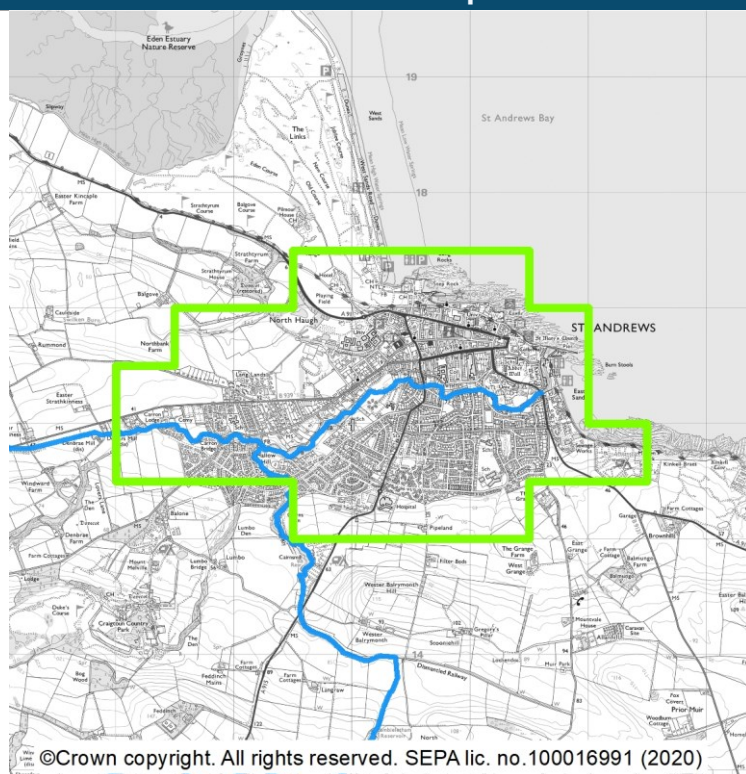
Flood risk management plan datasheet

St Andrews (target area 257)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood scheme or works design (Ref: 25701)	
Action	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.
Description	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.

Flood scheme or works implementation (Ref: 25702)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Description	Procurement and construction of the Kinness Burn Flood Protection Scheme should continue following the detailed design.

Surface water management plan (Ref: 25703)	
Action	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.
Description	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.

Shoreline management plan (coastal adaptive plan) (Ref: 25704)	
Action	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.
Description	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.

Community engagement (Ref: 25705)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.

Flood defence maintenance (Ref: 25706)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Maintenance of the existing coastal defences at St Andrews should continue.

Flood warning maintenance (Ref: 25707)	
Action	The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.
Description	SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

Coordination with the river basin management plan

This area has been identified as having potential for restoration in Scotland's river basin management plan. Actions should be coordinated to deliver any potential joint objectives for restoration and flood risk management. This should be considered in the earliest stages of any projects.

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)

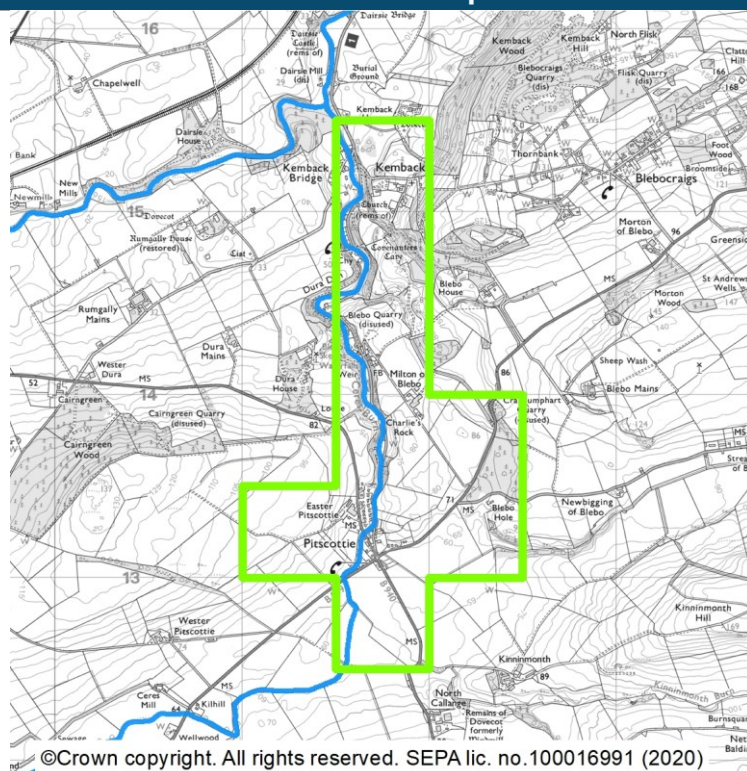
Flood risk management plan datasheet

Pitscottie and Kemback (target area 175)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 17501)	
Action	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.
Description	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.
Community engagement (Ref: 17502)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.
Flood defence maintenance (Ref: 17503)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.

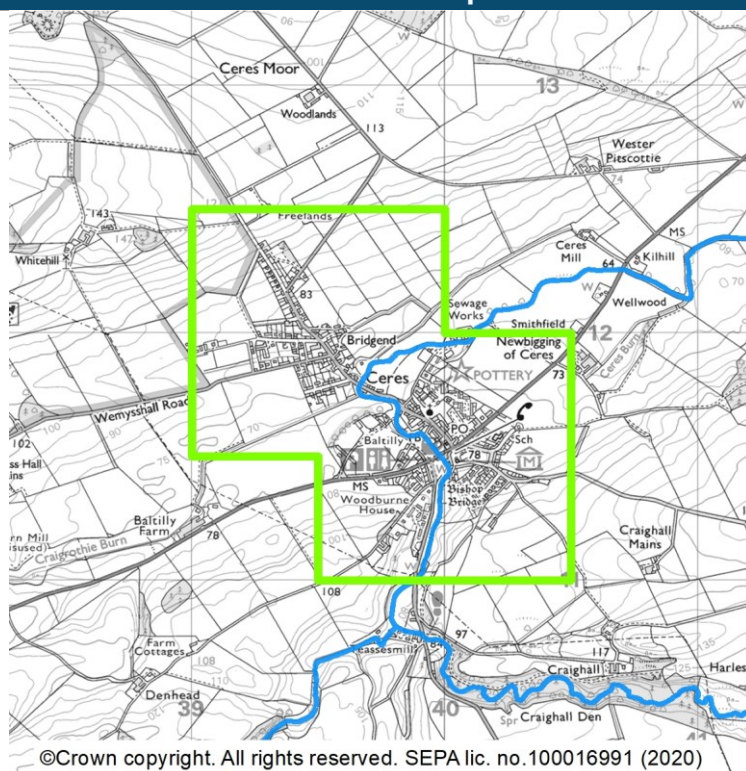
SEPA and responsible authorities carry out actions in all areas which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. A description of these actions is included in the Local Plan District section at the start of this document.

Ceres (target area 284)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood defence maintenance (Ref: 28401)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Maintenance to the Ceres Burn and Latch Burn flood defences should continue.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Adaptation plan (Ref: 28402)	
Action	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.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

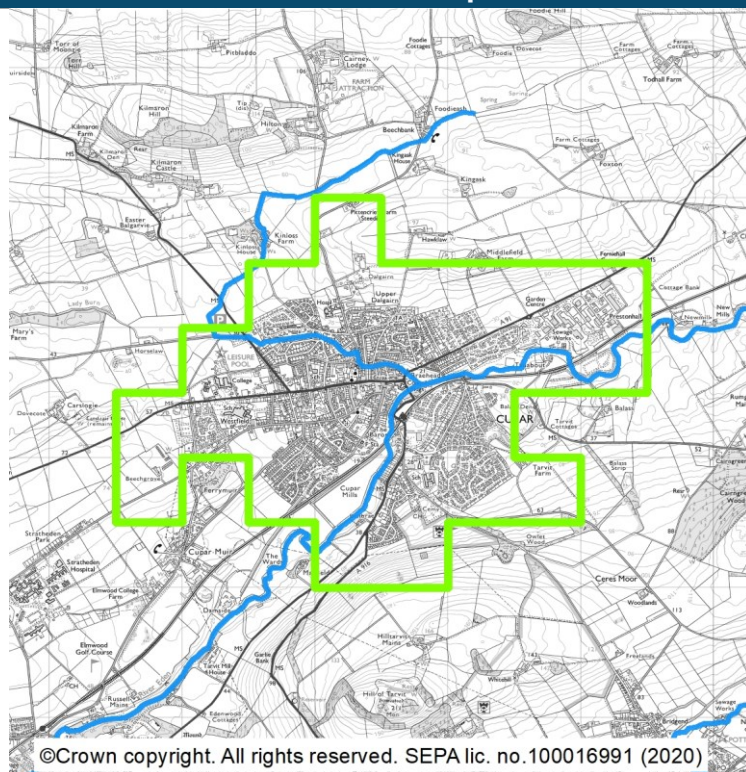
Cupar	(target area 218)
Springfield	(target area 256)

Cupar (target area 218)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.

- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 21801)	
Action	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.
Description	The Eden and Lady Burn Flood Study has concluded. Fife Council are considering next steps.
Surface water management plan (Ref: 21802)	
Action	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.
Description	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.
Community engagement (Ref: 21803)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.
Flood defence maintenance (Ref: 21804)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	Maintenance to the Millfield of Cupar Flood Protection Scheme should continue and updates to the maintenance regime be made as required.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Adaptation plan (Ref: 21805)	
Action	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.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

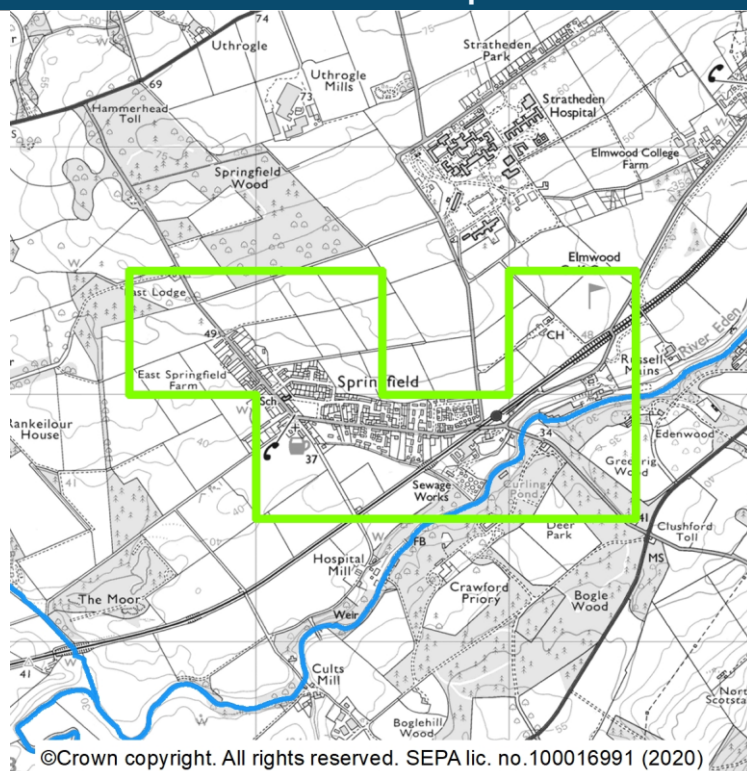
Flood risk management plan datasheet

Springfield (target area 256)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Surface water management plan (Ref: 25601)	
Action	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.
Description	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.

Community engagement (Ref: 25602)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

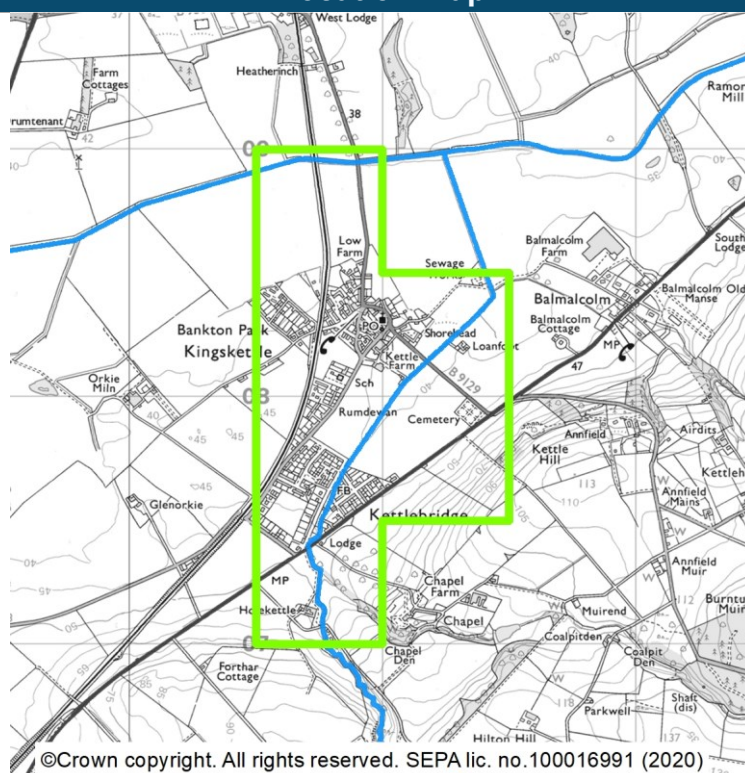
Kingskettle and Kettlebridge	(target area 238)
Freuchie	(target area 288)

Kingskettle and Kettlebridge (target area 238)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 23801)	
Action	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.
Description	The scheduled cycle 1 natural flood management study should continue to its conclusion.
Community engagement (Ref: 23802)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.

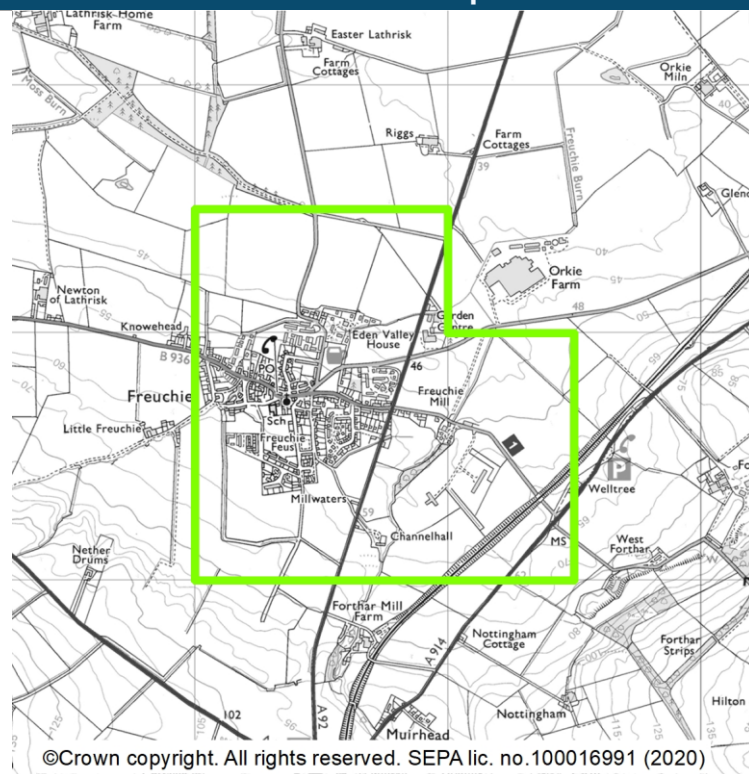
SEPA and responsible authorities carry out actions in all areas which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. A description of these actions is included in the Local Plan District section at the start of this document.

Freuchie (target area 288)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 28801)	
Action	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.
Description	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.

Community engagement (Ref: 28802)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

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

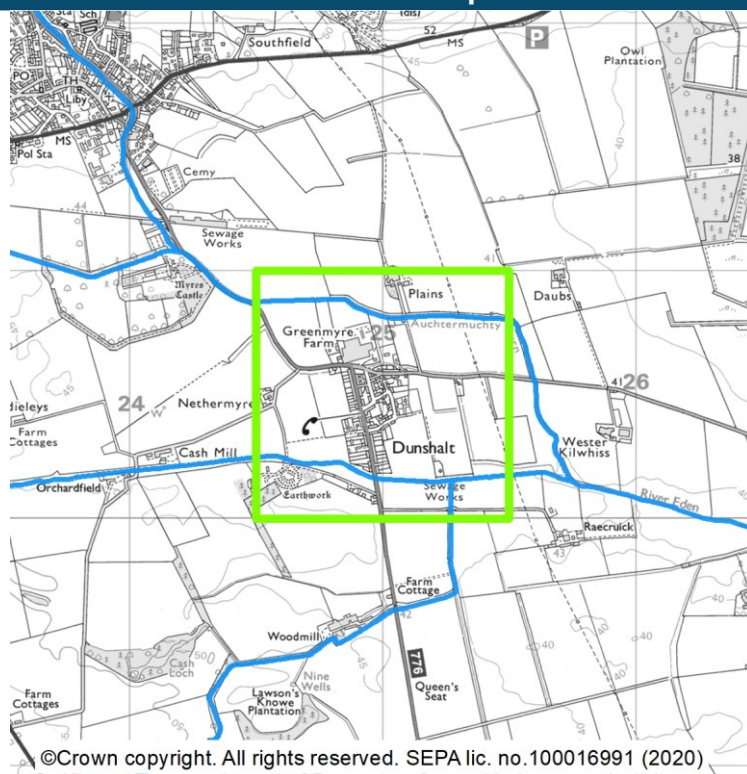
Dunshalt	(target area 173)
Auchtermuchty	(target Area 193)

Dunshalt (target area 173)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 17301)	
Action	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.
Description	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.

Flood defence maintenance (Ref: 17302)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Adaptation plan (Ref: 17303)	
Action	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.
Description	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.

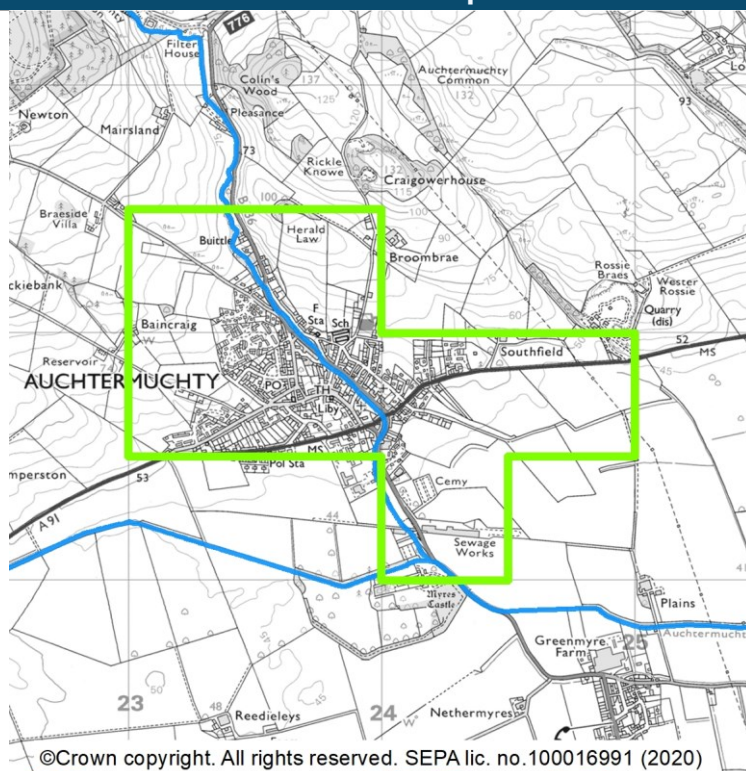
SEPA and responsible authorities carry out actions in all areas which help to manage current and future flooding. These actions help to ensure that key aspects of flood risk management are taken forward in all locations. They ensure that for example new housing developments occur in the right places, and that critical flood risk information is developed and updated for all areas. A description of these actions is included in the Local Plan District section at the start of this document.

Auchtermuchty (target area 193)

Summary

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.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment 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 for the area?

In each target area, SEPA and the responsible authorities have set objectives for the management of flood risk. In some locations, the objectives provide a short-term direction that will be reviewed and updated when more information is available. In others they provide a long-term direction for the management of flooding within a community. The objectives along with the current understanding of flood risk help to identify the actions that are required in the short and long term. It may take several years or multiple 6 year cycles to achieve the identified objectives, but they set a common goal for multiple agencies.

The following package of objectives have been established for this area. The objectives must be considered alongside national principles to manage flood risk. These include:

- Take a long term, risk-based approach to flood risk management decisions and one that considers the impacts of and adaptability to climate change.
- Deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services, and resources.
- Consider whole catchments and coastlines and work with natural processes and the environment to deliver multiple outcomes.

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

What actions are proposed for this area?

As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on the actions, their timing and how they will be funded and coordinated.

Actions proposed to start between 2022 and 2028

Flood study (Ref: 19301)	
Action	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.
Description	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.

Community engagement (Ref: 19302)	
Action	Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.
Description	Community engagement should be carried out based on the findings of the flood studies in the area.

Flood defence maintenance (Ref: 19303)	
Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Description	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.

Actions proposed after June 2028

The following actions are proposed to take place after June 2028. These will be reviewed in 2026, considering added information at that time, to ensure they are still the most appropriate actions for the community.

Adaptation plan (Ref: 19304)	
Action	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.
Description	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.

SEPA and responsible authorities carry out actions in all areas 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. A description of these actions is included in the Local Plan District section at the start of this document.

Annex 1: Costs of actions

Action	Indicative capital cost (£)	Notes
Adaptation plan	30,000	Costs can vary greatly depending on the scale and complexity of flooding
Data collection	20,000	
Flood scheme or works design	300,000	Costs can vary greatly depending on the scale and complexity of flooding, along with the ground conditions
Flood study	50,000	Costs can vary greatly depending on the scale and complexity of flooding
Flood study (existing flood defences)	80,000	
Flood study (options appraisal)	40,000	
Shoreline Management Plan (Coastal Adaptive Plan)	100,000	
Surface water management plan	30,000	
Flood scheme or works implementation	N/A	Schemes are very individual and it is not possible to provide an indicative cost.
The costs involved in the following actions are predominately from staff resource:		
Community engagement	N/A	Resources required are very specific for the individual action. It is currently not possible to estimate a resource cost.
Community flood alert	N/A	
Community resilience group	N/A	
Emergency plan	N/A	
Flood defence maintenance	N/A	Cost of maintenance is specific to the defence and is impacted by among other things age and type of the defences. It is not possible to provide indicative costs.
Flood risk management review	N/A	Resources required are very specific for the individual action. It is currently not possible to estimate a resource cost.
Flood warning maintenance	N/A	
Flood warning scoping	N/A	
Land Use Planning	N/A	
Maintain flood protection scheme	N/A	
New flood warning area	N/A	
Property flood resilience scheme	N/A	
Sewer flood risk assessment	N/A	
Site protection plan	N/A	
Strategic mapping improvements	N/A	

Annex 2: Flood risk management plans consultation summary

Asking for and listening to input from stakeholders and the public is a key part of flood risk management in Scotland. SEPA and the local authorities undertook a joint consultation, which ran in 2 phases between December 2020 and October 2021. Phase 1, opened in December 2020 and included a summary of flooding in each Local Plan District, a description of the potentially vulnerable areas and the identified local target areas. Phase 2 opened for responses on 30th July 2021 and closed on 31st October 2021. Phase 2 identified the objectives for each target area and the actions needed to achieve these objectives. It also included prioritisation of the actions by 6 year cycle. Local authorities provided more detail in the draft local flood risk management plans, which included an expanded description of the actions, and who would lead and coordinate delivery.

The consultation was open to everyone with an interest in flood risk management.

The communications campaign to publicise the consultation aimed to encourage anyone with an interest in flooding to have their say on how flood risk is managed across Scotland.

Communication activities included:

- A public notice in the Edinburgh Gazette and The Herald
- A national press release
- Social media posts on Facebook, Twitter, LinkedIn, Instagram
- A national targeted, paid social media campaign on Facebook, Twitter, and Instagram.

An animation and graphics were created to promote the consultation. These were shared with all responsible authorities in advance of the consultation and were regularly publicised via social media. The consultation was picked up by many local media outlets including local newspapers.

SEPA staff also supported several national events aimed at raising awareness of the consultation.

Demonstration of the consultation platform was provided to ensure that stakeholders were able to navigate the Citizen Space platform and answer the consultation questions.

Local authority flooding teams were provided with briefing packs with access to draft article templates and social media messages which they could use to promote the consultation within their own organisation and local area. Many local authorities used their network of community councils to promote the consultation.

In total SEPA received 677 responses. These included 654 online responses via the consultation platform Citizen Space and 23 e-mail responses received via SEPA's consultation mailbox. Compared to the first consultation on the flood risk management strategies in 2014, there has been a welcome three-fold increase in the number of responses. The majority of the responses (520) were from members of the public. This reflects increased public awareness of flooding and flood risk management, and the increasing risk due to climate change.

SEPA is grateful to individuals and organisations for considering the proposals and providing feedback. Responses varied from detailed comments on the actions proposed in individual target areas, to general comments on flooding and flood risk management. The sections below provide a brief outline of the responses received and changes made as a result.

Many of the aspects raised relate to the underlying requirements of the Flood Risk Management (Scotland) 2009 Act, to activities which are the responsibility of other organisations, or to the content of the local flood risk management plans. Working within safe data sharing practices, SEPA will ensure the feedback received is passed to other responsible authorities to consider and act on.

This summary is a factual statement of the responses provided. All responses received have been read and considered, resulting in a number of changes to the plans. Further detail on the analysis of responses will be published by SEPA in Spring 2022.

Identifying communities and infrastructure at risk

In the consultation SEPA asked whether all the main communities and infrastructure at significant risk of flooding were identified. 45% of respondents agreed that the main communities and infrastructure were identified and 29% stated they were not sure. 21% of respondents felt that some communities were missing from the plans.

Some respondents who had recently flooded were concerned that their communities were not identified as target areas. Some respondents suggested additional areas for SEPA to consider where flooding has occurred in the past. Concerns were also expressed about the method used to identify the main communities at risk.

Proposed objectives

34% of respondents supported the proposals for objectives to manage flood risk in target areas and 30% were not sure. 25% did not agree and 10% did not answer this question.

The main concerns of those who did not agree with the proposed objectives were that timescales were long-term and would not result in immediate action, objectives did not cover wider issues such as sewerage flooding, objectives were not detailed enough, and that objectives did not limit new development. There were concerns that there was no evidence being provided to show that the objectives were being met by the authorities, and that objectives were not leading to actions on the ground.

Proposed actions to manage flood risk

43% of respondents were not sure whether the actions would work towards achieving the objectives. 25% of respondents did not agree with the proposed actions to manage flood risk. 20% agreed with the proposed actions and 12% did not answer this question.

Those who did not agree expressed concerns that flood studies were not resulting in actions on the ground, that actions were not detailed enough, some stressed the need for other actions such as drain clearance being done now and some emphasised the need for a catchment-based approach and natural flood management.

Others asked for more watercourse clearing and river management and more transparency from the local authority in publicising the maintenance plan for flood defences. Concerns were also expressed that new development is not being controlled and is contributing to increased surface water flooding and that there were no actions to address sewerage flooding. Concerns were also raised about funding for actions.

NatureScot provided feedback on specific target areas and the impacts on biodiversity and designated sites.

Timescales for implementing actions

In terms of the proposed timescales, 36% of respondents did not agree and 32% were not sure of the identified timescales. 17% agreed and 15% did not respond to this question.

Those who disagreed were concerned that actions were taking too long and that more urgent action is needed in light of climate change. Respondents also commented that timescales were too vague and should be more detailed.

What can individuals, communities and organisations do to help manage flood risk?

SEPA also asked whether individuals, communities or organisations were able to help with flood risk management in Scotland. There was a range of responses to this question, with 39% of respondents agreeing that there is something they could do to help manage flood risk and 26% of respondents not sure that there are things they could do.

Those who were not sure asked for more guidance from the authorities. However, many felt that there was something that communities or individuals can do. Suggestions included less paving of gardens to help attenuate rainwater, authorities developing information to help the public make more informed decisions, community organised clearance of watercourses where it is safe to do so, reporting blockages and flooding to the authorities, planting trees and greening of cities.

Acting on consultation feedback

Several changes were made to the final flood risk management plans as a result of the input received during the consultation. A summary of those changes is provided in the table below, and full details will be provided in the consultation digest to be published by SEPA in Spring 2022.

Summary of changes made to the plans following the consultation	
1.	Further actions were added to manage flood risk in several target areas.
2.	Additional Local Plan District actions were added.
3.	Some actions were removed from the flood risk management plans at the request of local authorities responsible for their delivery due to completion in the time between consultation and publication.
4.	Further information was included on how climate change was assessed in the preparation of the plans.
5.	Further information was included on how potentially vulnerable areas were identified, and when they will be reviewed again.
6.	Information was included on the progress made in implementing actions and working towards objectives in the 2015 strategies.
7.	A target area boundary was amended based on new information provided.
8.	A description of the importance of community actions, recognising the work that communities do to manage flooding was included, along with further information on where support is available to help people reduce their own flood risk.
9.	A description of the catchment-based approach SEPA has taken, and the role it plays in delivering flood risk management actions was provided.
10.	The link between flood risk management plans and land use planning was clarified.
11.	Habitats Regulations Appraisal statements were added to each relevant action.
12.	Some other changes were made to the way information is presented to try to make it clearer e.g., on the timing of actions being carried out.
13.	Further information was provided on the uncertainty associated with funding of flood risk management actions.

Annex 3: Acknowledgements

SEPA acknowledges the cooperation and input provided in preparing these plans, including the following:

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Local authorities SEPA acknowledges the provision of flood models and other supporting data and information from local authorities in Scotland and their collaboration in the production of flood risk management information.

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

The Flood Hazard Research Centre Multi-coloured Manual and Multi-coloured Handbook 2016.

All contributors to the **2018 NFRA**, more information on which can be found at <https://www.sepa.org.uk/data-visualisation/nfra2018/>