

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

Draft flood risk management plans 2022-2028

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# Tay Estuary and Montrose Basin Local Plan District (LPD 7)

# Draft flood risk management plans 2022-2028

The Tay Estuary and Montrose Basin Local Plan District covers around 2,700km<sup>2</sup> 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.

#### 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 six years, and most of these are carried out on an ongoing basis.

|        | Awareness raising  |
|--------|--|
| Action | SEPA the responsible authorities and other organisations such as the<br>Scottish Flood Forum work together to help communities understand the risk<br>of flooding and what actions individuals can take through national and local<br>initiatives. Improved awareness of flood risk and actions that prepare<br>individuals, homes and businesses for flooding can reduce the overall<br>impact of flooding. |
|        | Local authorities undertake additional awareness raising activities when developing any specific project proposals and will engage with community resilience groups and local communities.   |
|        | 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.   |

|        | Emergency response and plans   |
|--------|--|
| Action | Many organisations, including local authorities, the emergency services and<br>SEPA provide an emergency response to flooding. Emergency plans are<br>prepared and maintained under the Civil Contingencies Act 2004 by<br>Category 1 and 2 Responders and are coordinated through regional and<br>local resilience partnerships, often supported by voluntary organisations.<br>They set out the steps to be taken to maximise safety and minimise impacts<br>during flooding. Emergency plans may also be prepared by individuals,<br>businesses, organisations or communities. Scottish Water is a Category 2<br>responder under the Civil Contingencies Act 2004 and will support regional<br>and local resilience partnerships as required. |

|        | Flood forecasting   |
|--------|---|
| Action | The Scottish Flood Forecasting Service is a partnership between SEPA and<br>the Met Office. The service continues to produce a daily, national flood<br>guidance statement, issued to emergency responders, local authorities and<br>other organisations with flood risk management duties. As the flood warning<br>authority for Scotland SEPA continues to provide its flood warning service<br>issuing flood alerts and warnings when required, giving people a better |
|        | chance of reducing the impact of flooding on their home or business.  |

|        | Flood Warning Development Framework   |
|--------|---|
| Action | 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.   |
|        | SEPA will continue to develop the Scottish Flood Forecast, a 3 day forecast<br>of flood risk across Scotland and bring together all live information such as<br>flood warnings, river levels and rainfall data into a central hub easily<br>accessible for the public.  |
|        | Working in close partnership with the Met Office through the Scottish Flood<br>Forecasting Service, SEPA will develop its capability in surface water<br>flooding forecasting, focusing initially on the transport sector to support<br>climate-ready infrastructure. SEPA will also undertake a prioritised<br>improvement programme of existing river and coastal flood warning<br>schemes to provide more accurate forecast with improved lead time. |

|        | Guidance development  |
|--------|---|
| Action | The Scottish Government and SEPA will develop and update guidance to<br>inform flood risk management projects. This guidance will be produced by<br>June 2022 and will look at how best to adapt to the long-term impacts of<br>climate change and the most appropriate methods of assessing the benefits<br>of flood risk management actions.<br>Technical guidance to support flood risk management partners will also be<br>reviewed and updated by SEPA where required. |
|        |   |

|        | Hazard mapping updates   |
|--------|--|
| Action | 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. (Flood Maps link) 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.               |

|        | Land use planning  |
|--------|--|
| Action | National planning policies set out the Scottish Ministers' priorities for the operation of the planning system and 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, the Scottish Planning Policy and accompanying Planning Advice notes restrict development within the floodplain and limit exposure of new receptors to flood risk. Local planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk. |
|        | sustainable development.   |

|        | Maintenance   |
|--------|---|
| Action | Local authorities have a duty to assess bodies of water and to carry out<br>clearance and repair works where such works would substantially reduce<br>flood risk. Local authorities are also responsible for the drainage of roads. In<br>addition, local authorities may also be responsible for maintenance of any<br>existing flood protection schemes or works. |
|        | Scottish Water will continue to undertake risk-based inspection, maintenance and repair on the public sewer network.  |
|        | Asset owners and riparian landowners are responsible for the maintenance<br>and management of their own assets including those which help to reduce<br>flood risk.  |

|        | Natural flood management mapping  |
|--------|---|
| Action | SEPA will review and update the opportunities mapping for natural flood<br>management. This work will focus on the suburban environment and look at<br>linking blue-green infrastructure with the surrounding natural catchment.<br>Natural flood management seeks to store or slow down flood waters through<br>measures such as the planting of woodlands, wetland creation, river<br>restoration, or the creation of intertidal habitats. In addition to flooding<br>benefits, natural flood management measures can also provide many<br>additional benefits to biodiversity, water quality and recreation. |

|        | 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 21 <sup>st</sup> century. SEPA will use the most |
|        | suitable data to develop the National Flood Risk Assessment 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<br>flooding has the potential to impact more properties in Scotland than any<br>other source of flooding. Over the next six-year cycle SEPA will look to<br>vastly improve its national understanding of surface flood risk by undertaking<br>a wholescale update of the national surface water maps to reflect<br>developments in data and understanding, including the impact of climate<br>change. |

|        | Reservoirs  |
|--------|---|
| Action | SEPA will continue to develop its assessment of flood risk from dam failure<br>and use these assessments to direct a proportionate regulatory approach to<br>ensure reservoir safety. Over the next management cycle we will<br>implement further developments of our flood warning capabilities in the<br>unlikely event of reservoir failure. |

| Scottish Flood Defence Asset Database  |
|--|
| We are in a global climate emergency. The evidence is clear. In Scotland one of the main impacts of climate change will be increased flooding. SEPA  |
| will push forward the development of adaptation planning within Scotland.<br>This work will start by reviewing and developing our understand of how and<br>when Scotland's flood defence assets can be adapted to continue to provide<br>vital protection from flooding in the future. |
|  |

|        | Self help   |
|--------|---|
| Action | Everyone is responsible for protecting themselves and their property from<br>flooding. Property and business owners can take simple steps to reduce<br>damage and disruption to their homes and businesses should flooding<br>happen. This includes preparing a flood plan and flood kit, installing property<br>flood resilience measures, signing up to Floodline, engaging with their local<br>flood group, and ensuring that properties and businesses are insured<br>against flood damage. |
|        | Responsible authorities and SEPA will continue to develop the<br>understanding of flood risk to communities and promote measures to help<br>individuals and businesses to reduce their risk.  |

# Potentially Vulnerable Areas

Potentially Vulnerable Areas (PVA) were designation 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 (<u>link</u>). As part of continued analysis of flood risk, the National Flood Risk Assessment and Potentially Vulnerable Areas (PVA) will be reviewed every six 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 - table of contents

### Click the blue text to select your area of interest

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

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Auchenblae

(target area 192)

# Flood risk management plan datasheet



# 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.



### 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. |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

### Actions proposed to start before June 2028

|               | Flood risk management review (Ref: 19201)  |
|---------------|--|
| Action        | During each 6 year planning cycle, we update our understanding of flooding to<br>include all new data and information that has become available. This includes<br>information on any flooding that has happened and the latest predictions on the<br>impacts of climate change. The updated understanding is used to set any<br>appropriate objectives and actions for areas at risk of flooding.  |
| Action detail | No local actions specific to this target area have been identified yet. There are<br>national actions planned that will cover this area, including an update to SEPA's<br>surface water flood maps and an update to the national flood risk assessment.<br>These, along with other actions that are carried out across the whole local plan<br>district covering this area, will help to manage flood risk in the long term. The need<br>for actions for this area will be reviewed again in 2026. |
| Coordination  | The action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

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.

#### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed 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.



## 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<br>Cauldcotts and its tributaries in Fettercairn as well as the<br>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.   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

### Actions proposed to start before June 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. 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. |
| Action detail | Better understanding of flooding issues from the Burn of Cauldcotts and its<br>tributaries is needed. The performance of the Fettercairn Flood Prevention Scheme<br>is also to be reviewed, because there is new information on rainfall patterns, new<br>modelling techniques and an improved understanding of the impacts of climate<br>change on flood risk. This may include data collection and monitoring to improve the<br>confidence in the performance of the flood prevention scheme. Post flood event<br>surveys may also be required.  |
| Coordination  | The action delivery lead is Aberdeenshire Council and coordination will be determined once the actions have been finalised.  |

|               | 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.  |
| Action detail | Maintenance to the Fettercairn Flood Prevention Scheme should continue and<br>updates to the maintenance regime be made based on the findings of the flood<br>modelling. |
| Coordination  | The action delivery lead is Aberdeenshire Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed 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.



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## What is the current understanding of flood risk?

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

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

### Actions proposed to start before June 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. |
| Action detail | SEPA should maintain the River North Esk flood warning scheme.   |
| Coordination  | The action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

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.

## What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed 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.



## 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<br>management and maintenance of existing coastal defences<br>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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

# Actions proposed to start before June 2028

|               | Catchment/coastal management implementation (Ref: 25101)  |
|---------------|---|
| Action        | Improvements to catchment or coastal management are to be implemented following agreement of the design, costs and timescales.  |
| Action detail | The Montrose Coastal Flood Study also outlined that a short-term option of dune<br>propagation could be used to maintain the integrity of the dunes for approximately<br>10 years. The short term option is currently under detailed design and aims to<br>provide protection against erosion and flooding to the Montrose golf course. These<br>works should be considered as part of adaptation planning. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.   |

|               | Strategic mapping improvements (Ref: 25102)   |
|---------------|---|
| Action        | SEPA will continue to update flood maps based on new information.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

|               | Flood scheme or works design (Ref: 25103)   |
|---------------|---|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.  |
| Action detail | 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. Two studies have been undertaken recently for Montrose. A general study of flood risk was completed in 2019 which provided recommendations for the coastal management of flood risk. The pan government study by Dynamic Coast identified the criticality of the dunes at Montrose Beach in providing flood protection at the location. Angus Council will continue to develop sustainable coastal management actions to reduce flood risk at 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.   |

|               | Surface water management plan (Ref: 25104)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system have been identified.<br>Next steps in managing such water ponding or over-whelmed drainage systems<br>have been identified and should be implemented. The Plan is to be reviewed and<br>updated as needed.   |
| Action detail | Angus Council will continue to develop and where funding allows implement the<br>Angus wide surface water management plan, which includes Montrose and<br>Ferryden. The surface water management plan identifies areas most at risk from<br>surface water flooding in Montrose and Ferryden and identifies options that could<br>alleviate flood risk. The sewer flood risk assessment undertaken by Scottish Water<br>will continue as planned to address complex surface water and sewer flood risk and<br>interaction with small/culverted watercourses. As part of this, Angus Council will use<br>best available knowledge on climate change predictions to assess the effect on<br>flood risk infrastructure. From this a long term flood risk management approach will<br>be developed. |
| Coordination  | Action delivery lead is Angus Council in coordination with Scottish Water.   |

|               | Adaptation plan (Ref: 25105)   |
|---------------|--|
| 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.  |
| Action detail | An adaptation master plan will be developed to cover the Angus Council area. As<br>part of this, Angus Council will use best available knowledge on climate change<br>predictions to assess the effect on flood risk infrastructure. From this a long term<br>flood risk management approach will be developed. Any existing strategic initiatives<br>will provide opportunities for adaptive actions to be implemented. |
| Coordination  | Action delivery lead is Angus Council and coordinated with the surface water management plan and the shoreline management plan.  |

|               | Flood warning maintenance (Ref: 25106)   |
|---------------|--|
| Action        | The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required. |
| Action detail | SEPA should maintain the Aberdeenshire and Angus coastal flood warning scheme.   |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

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.

### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There is potential to work jointly with Montrose Port Authority relating to investigations of erosion and flood risk in the area.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Brechin

(target area 203)

# Flood risk management plan datasheet



# 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.



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

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national 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<br>management and maintenance of Brechin Flood Protection<br>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   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

# Actions proposed to start before June 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is South Esk Partnership and coordinatied with the adaptation plan.   |

|               | 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   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.  |

|               | Surface water management plan (Ref: 20303)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed.   |
| Action detail | Angus Council will continue to develop and where funding allows implement the<br>Angus wide surface water management plan, which includes Brechin as a priority<br>area. The surface water management plan identifies areas most at risk from surface<br>water flooding in Brechin and identifies options that could alleviate this risk. The<br>sewer flood risk assessment undertaken by Scottish Water will be reviewed for<br>opportunities to address complex surface water and sewer flood risk and interaction<br>with small/culverted watercourses. As part of this, Angus Council will use best<br>available knowledge on climate change predictions to assess the effect on flood risk<br>infrastructure. From this a long term flood risk management approach will be<br>developed. |
| Coordination  | Action delivery lead is Angus Council in coordination with Scottish Water.   |

|               | 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.  |
| Action detail | An adaptation master plan will be developed to cover the Angus Council area. As<br>part of this, Angus Council will use best available knowledge on climate change<br>predictions to assess the effect on flood risk infrastructure. From this a long term<br>flood risk management approach will be developed. Any existing strategic initiatives<br>will provide opportunities for adaptive actions to be implemented. |
| Coordination  | Action delivery lead is Angus Council and coordinated with the surface water management plan, catchment management plan and community engagement.  |

|               | 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.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.   |

|               | 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.   |

|               | 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. |
| Action detail | SEPA should maintain the South Esk flood warning scheme.   |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

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.

### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There are opportunities to work with the River South Esk Catchment Partnership.

# 02/07/06 (Arbroath)

This area is designated as a Potentially Vulnerable 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

### List of target areas

Arbroath

(target area 190)

# Flood risk management plan datasheet



## 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.



### 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 built 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<br>management and maintenance of the Brothock Water Flood<br>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   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

## Actions proposed to start before June 2028

|               | Strategic mapping improvements (Ref: 19001)   |
|---------------|---|
| Action        | SEPA will continue to update flood maps based on new information.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

|               | Flood study (Ref: 19002)   |
|---------------|--|
| Action        | An understanding of flood risk and associated issues in the area is to be developed,<br>which may include surveys and modelling and should consider the impacts of<br>climate change on flood risk.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

|               | Flood study (options appraisal) (Ref: 19003)   |
|---------------|--|
| Action        | In areas where flood risk is confirmed, a range of possible options to manage flood<br>risk are to be identified, including natural flood management actions where suitable,<br>and a preferred approach is to be chosen. This should include adaptive planning to<br>allow for the impacts of climate change to be monitored, understood and managed. |
| Action detail | Joint study to identify potential options to reduce surface water and sewer flooding is ongoing through the integrated catchment study optioneering project. Outputs from this study will be received during public consultation and this action will be updated prior to final publication dependent on study outcomes.                               |
| Coordination  | Action delivery leads are Scottish Water and Angus Council and coordination will be determined once the actions have been finalised.   |

|               | Flood scheme or works implementation (Ref: 19004)  |
|---------------|--|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.   |
| Action detail | The construction of the Arbroath (Brothock Water) Flood Protection Scheme has<br>commenced and is due to be completed in 2023. As built drawings will be made<br>available to SEPA, for consideration in the Scottish Flood Defence Asset Database,<br>flood map updates and flood warning scheme updates. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

|               | Flood defence maintenance (Ref: 19005)   |
|---------------|--|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.  |
| Action detail | Angus Council will develop a formal maintenance programme for the flood<br>protection scheme following construction. This will take the form of planned and<br>reactive maintenance. As built drawings will be made available to SEPA for<br>consideration in the Scottish Flood Defence Asset Database, flood maps and flood<br>warning scheme updates. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

|               | Flood warning maintenance (Ref: 19006)   |
|---------------|--|
| Action        | The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required. |
| Action detail | SEPA should maintain the Brothock Water flood warning scheme.  |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

|               | Flood warning maintenance (Ref: 19007)  |
|---------------|---|
| Action        | The Floodline flood warning service is to be kept operational through maintenance to the existing system and updates being undertaken as required.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

|               | Shoreline Management Plan (Coastal Adaptive Plan) (Ref: 19008)   |
|---------------|--|
| Action        | The existing assessment of coastal flood and erosion risk is to be reviewed and<br>updated as required. The plan should include assessment of climate change and<br>develop adaptive approaches to allow for the impacts of climate change to be<br>monitored, understood and managed. |
| Action detail | A Shoreline Management plan covers this area. This should be reviewed as part of<br>the adaptation plan taking into account best available knowledge on climate change<br>predictions.   |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.  |

|               | Sewer flood risk assessment (Ref: 19009)  |
|---------------|---|
| 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|               | Surface water management plan (Ref: 19010)  |
|---------------|---|
| 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. |
| Action detail | Angus Council will continue to develop and where funding allows implement the<br>Angus wide surface water management plan, which includes Arbroath as a priority<br>area. The integrated catchment study led by Scottish Water will continue as planned<br>to address complex surface water and sewer flood risk and interaction with<br>small/culverted watercourses.  |
| Coordination  | Action delivery lead is Angus Council in coordination with Scottish Water.  |

|               | Community engagement (Ref: 19011)  |
|---------------|--|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.  |

|               | Adaptation plan (Ref: 19012)   |
|---------------|--|
| 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.  |
| Action detail | An adaptation master plan will be developed to cover the Angus Council area. As<br>part of this, Angus Council will use best available knowledge on climate change<br>predictions to assess the effect on flood risk infrastructure. From this a long-term<br>flood risk management approach will be developed. Existing strategic initiatives<br>such as the active travel plan in Arbroath will provide opportunities for adaptive<br>actions to be implemented. |
| Coordination  | Action delivery lead is Angus Council and coordinated with the surface water management plan and the shoreline management 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.

|               | 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. |
| Action detail | SEPA should investigate improvements to the Brothock Water flood warning scheme.   |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.   |

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.

#### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There is potential to work with SEPA's River Basin Management team to improve the physical condition of the water environment.
# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Carnoustie

(target area 210)

PUBLIC

# Flood risk management plan datasheet



# 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.



# 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.

| Objective ref | Objective type       | Objective description  |
|---------------|----------------------|--|
| 2101          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>Carnoustie and Barry   |
| 2102          | Avoid flood risk     | Avoid an increase in flood risk by the appropriate<br>management and maintenance of the existing Barry Burn<br>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<br>Carnoustie and Barry   |
| 2105          | Reduce flood risk    | Reduce the risk of surface water flooding in Carnoustie and Barry  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Flood scheme or works design (Ref: 21001)   |
|---------------|---|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.                                |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.   |

|               | Shoreline Management Plan (Coastal Adaptive Plan) (Ref: 21002)   |
|---------------|--|
| Action        | The existing assessment of coastal flood and erosion risk is to be reviewed and<br>updated as required. The plan should include assessment of climate change and<br>develop adaptive approaches to allow for the impacts of climate change to be<br>monitored, understood and managed. |
| Action detail | A shoreline management plan covers this area. This should be reviewed as part of<br>the adaptation plan taking into account best available knowledge on climate change<br>predictions.   |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

|               | Sewer flood risk assessment (Ref: 21003)  |
|---------------|---|
| 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|               | Surface water management plan (Ref: 21004)  |
|---------------|---|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system have been identified.<br>Next steps in managing such water ponding or over-whelmed drainage systems<br>have been identified and should be implemented. The Plan is to be reviewed and<br>updated as needed.  |
| Action detail | Angus Council will continue to develop and where funding allows implement the<br>Angus wide surface water management plan, which includes Carnoustie and Barry<br>as a priority area. The surface water management plan identifies areas most at risk<br>from surface water flooding in Carnoustie and Barry and identifies options that could<br>alleviate this risk. The integrated catchment study undertaken by Scottish Water will<br>be reviewed for opportunities to address complex surface water and sewer flood risk<br>and interaction with small/culverted watercourses. As part of this, Angus Council will<br>use best available knowledge on climate change predictions to assess the effect on<br>flood risk infrastructure. From this a long term flood risk management approach will<br>be developed. |
| Coordination  | Action delivery lead is Angus Council in coordination with Scottish Water.  |

|               | Adaptation plan (Ref: 21005)   |
|---------------|--|
| 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.  |
| Action detail | An adaptation master plan will be developed to cover the Angus Council area. As<br>part of this, Angus Council will use best available knowledge on climate change<br>predictions to assess the effect on flood risk infrastructure. From this a long term<br>flood risk management approach will be developed. Any existing strategic initiatives<br>will provide opportunities for adaptive actions to be implemented. |
| Coordination  | Action delivery lead is Angus Council and coordination will be required with the surface water management plan, natural flood management and community engagement actions.   |

|               | Community engagement (Ref: 21006)   |
|---------------|---|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.   |

|               | Flood defence maintenance (Ref: 21007)   |
|---------------|--|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

# What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

## List of target areas

Monifieth

(target area 250)

# Flood risk management plan datasheet



# 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.



## 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.

| Objective ref | Objective type       | Objective description   |
|---------------|----------------------|---|
| 2501          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | 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.                  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Angus Council with Dundee City Council and coordination will be determined once the actions have been finalised.   |

|               | Flood scheme or works design (Ref: 25002)   |
|---------------|---|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.  |
| Action detail | A flood protection scheme has been recommended on the Dighty Water following<br>the recent flood study. The scheme would provide a 200 year (0.5% annual<br>exceedance probability) standard of protection and would include flood storage,<br>flood walls and embankments and flood resilience measures. It is recommended<br>that the scheme is progressed to design stage. Additional consideration should be<br>given to natural flood management measures. The impact of climate change should<br>also be further considered which should form the basis for development of an<br>adaptation plan. There may be opportunities to combine procurement of this with the<br>flood protection scheme for Carnoustie. Dundee City Council jointly progress the<br>preferred option to outline design and detailed design. |
| Coordination  | Action delivery lead is Angus Council with Dundee City Council. Coordination will be determined once actions have been finalised.   |

|               | Flood scheme or works design (Ref: 25003)  |
|---------------|--|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.   |
| Action detail | A flood protection scheme has been recommended on the Monifieth Burn following<br>the recent flood study. The scheme includes a combination of works and natural<br>flood management actions. Angus Council and Dundee Council will work together to<br>develop the scheme to outline design stage in Cycle 2 - 3. Current and long term<br>flood risk will be considered and the design will incorporate adaptation actions<br>identified in the adaptation plan and surface water management plan for Monifieth. |
| Coordination  | Action delivery lead is Angus Council and coordination will be determined once the actions have been finalised.  |

|               | Shoreline Management Plan (Coastal Adaptive Plan) (Ref: 25004)   |
|---------------|--|
| Action        | The existing assessment of coastal flood and erosion risk is to be reviewed and<br>updated as required. The plan should include assessment of climate change and<br>develop adaptive approaches to allow for the impacts of climate change to be<br>monitored, understood and managed. |
| Action detail | A shoreline management plan covers this area. This should be reviewed as part of<br>the adaptation plan taking into account best available knowledge on climate change<br>predictions.   |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.  |

|               | 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|               | Surface water management plan (Ref: 25006)  |
|---------------|---|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system have been identified.<br>Next steps in managing such water ponding or over-whelmed drainage systems<br>have been identified and should be implemented. The Plan is to be reviewed and<br>updated as needed.  |
| Action detail | Angus Council will continue to develop and where funding allows implement the<br>Angus wide surface water management plan, which includes Monifieth. The surface<br>water management plan identifies areas most at risk from surface water flooding in<br>Monifieth and identifies options that could alleviate this risk. The integrated<br>catchment study undertaken by Scottish Water will continue as planned to address<br>complex surface water and sewer flood risk and interaction with small/culverted<br>watercourses. As part of this, Angus Council will use best available knowledge on<br>climate change predictions to assess the effect on flood risk infrastructure. From this<br>a long term flood risk management approach will be developed. |
| Coordination  | Action delivery lead is Angus Council in coordination with Scottish Water.  |

|               | 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.  |  |
| Action detail | An adaptation master plan will be developed to cover the Angus Council area. As<br>part of this, Angus Council will use best available knowledge on climate change<br>predictions to assess the effect on flood risk infrastructure. From this a long term<br>flood risk management approach will be developed. Any existing strategic initiatives<br>will provide opportunities for adaptive actions to be implemented. |  |
| Coordination  | Action delivery lead is Angus Council and coordinated with the surface water management plan and shoreline management plan   |  |

|               | 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.   |  |
| Action detail | 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. |  |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.  |  |

|               | lood Defence Maintenance (Ref: 25009)   |  |
|---------------|---|--|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.   |  |
| Action detail | 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. |  |
| Coordination  | Action delivery lead is Angus Council and coordinated with the adaptation plan.   |  |

|               | 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.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

## What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 areas in this Potentially Vulnerable Area, which have been the focus of further assessment, these are listed below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

## List of target areas

Invergowrie Broughty Ferry Dundee (target area 235) (target area 269) (target area 270)

PUBLIC

# 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.



# 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.

| Objective ref | Objective type       | Objective description   |
|---------------|----------------------|---|
| 2351          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>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.   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Sewer flood risk assessment (Ref: 23501)  |
|---------------|---|
| 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|               | Flood study (Ref: 23502)   |
|---------------|--|
| 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.  |
| Action detail | 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.                                       |
| Coordination  | The action delivery lead is Perth and Kinross Council. Perth and Kinross Council is coordinating the natural flood management study with Dundee City Council, Angus Council and other partners in the Tay Estuary and Montrose Basin Local Plan District partnership. The study is being coordinated with other related actions. |

|               | 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.   |  |
| Action detail | Community engagement will continue in connection with ongoing projects and activities.   |  |
| Coordination  | The action delivery lead is Perth and Kinross Council. Awareness raising and community engagement will take place around any projects and will be coordinated through the Local Plan District Partnership. |  |

# What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

The current natural flood management study is being delivered jointly by Perth and Kinross Council, Angus Council and Dundee City Council.



# 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.



# 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.

| 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<br>management and maintenance of Broughty Ferry Flood<br>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.  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Flood scheme or works implementation (Ref: 26901)   |
|---------------|---|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.   |

|               | 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.  |
| Action detail | Once the Broughty Ferry (coastal) Flood Protection scheme is completed, Dundee<br>City Council should start the scheme inspection and maintenance programme. The<br>maintenance programme for the five year period after completion should include<br>monitoring and repair/repositioning/raising of the Broughty Ferry sand dune fencing<br>as required, an annual assessment of the sand dunes, as well as specific site<br>monitoring visits after any storm which is likely to have damaged the dunes. Any<br>remedial work to the sand dunes identified from the annual assessments should be<br>delivered during the early winter, and any damage identified after storms should be<br>repaired as quickly as possible. After a five year period from construction, as well as<br>site monitoring visits following storms, twice yearly monitoring and topographical<br>survey of the dunes should be undertaken and kept under review to ensure the<br>provision of effective flood protection. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.  |

|               | 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council in coordination with Angus Council.  |

|               | Flood scheme or works implementation (Ref: 26904)   |
|---------------|---|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.  |
| Action detail | 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. 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. |
| Coordination  | Action delivery lead is Dundee City Council. The action should be coordinated between Angus Council and Dundee City Council.  |

|               | 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|                             | Surface water management plan (Ref: 26906)   |
|-----------------------------|--|
| Action                      | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed. |
| Action detail               | 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.       |
| Coordination risk managemer | ക്ഷിക്കെങ്കില്ക്കുവിട്ടാൽമ് Dundee City Council in coordination with Scattish Water.   |

|               | 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council in coordination with Scottish Water and SEPA.  |

|               | Land use planning (Ref: 26908)   |
|---------------|--|
| Action        | Planning authority should ensure that their development plan and planning decision-<br>making supports delivery of sustainable flood management.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.  |

|               | 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.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

# What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There is an opportunity for joint working on the development of longer term Dundee City Council and Scottish Water surface water drainage strategies.



# 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.



# 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 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.

Flood risk management plans consultation July 2021

| Objective ref | Objective type       | Objective description   |
|---------------|----------------------|---|
| 2701          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>Dundee  |
| 2702          | Avoid flood risk     | Avoid an increase in flood risk by the appropriate<br>management and maintenance of the Dundee Flood<br>Protection Scheme.  |
| 2703          | Avoid flood risk     | Avoid an increase in flood risk in Dundee by the appropriate<br>protection, management and maintenance of natural features<br>in Dighty, Fithie Burn, Gelly Burn, Gorrie Burn and Murroes<br>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.  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Flood scheme or works design (Ref: 27001)  |
|---------------|--|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.  |

|               | Flood scheme or works implementation (Ref: 27002)  |
|---------------|--|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.   |
| Action detail | The responsible authority proposes this action as the best option for managing flood<br>risk in this community. The delivery of this action is subject to funding being made<br>available. Dundee City Council should progress the phase 2 of the Dundee (coastal)<br>Flood Protection Scheme which includes Dundee City Quay, Docks and Airport. As<br>built drawings should be made available to SEPA, for consideration in the Scottish<br>Flood Defence Asset Database, flood map updates and flood warning scheme<br>updates. The impact of climate change should be further considered and<br>information developed should form the basis for development of an adaptation plan. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.  |

|               | Flood scheme or works design (Ref: 27003)   |
|---------------|---|
| Action        | The selected preferred approach for managing river flood risk is to be designed<br>following the completion of the river flood study, including consideration of the long-<br>term impacts of climate change. These can include small scale works or works to<br>improve catchment management. This should guide adaptive planning to allow for<br>the impacts of climate change to be monitored, understood and managed.   |
| Action detail | 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. 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be required with<br>Angus Council.  |

|               | Flood scheme or works implementation (Ref: 27004)   |
|---------------|---|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be required with<br>Angus Council.  |

|               | Sewer flood risk assessment (Ref: 27005)  |
|---------------|---|
| 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  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Scottish Water in coordination with the local authority and SEPA.   |

|               | Surface water management plan (Ref: 27006)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed.             |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be required with Scottish Water and SEPA.  |

|               | Flood study (options appraisal) (Ref: 27007)   |
|---------------|--|
| Action        | In areas where flood risk is confirmed, a range of possible options to manage flood<br>risk are to be identified, including natural flood management actions where suitable,<br>and a preferred approach is to be chosen. This should include adaptive planning to<br>allow for the impacts of climate change to be monitored, understood and managed. |
| Action detail | Joint study to identify potential options to reduce surface water and sewer flooding is ongoing through the integrated catchment study optioneering project. Outputs from this study will be received during public consultation and action will be updated prior to final publication dependent on study outcomes.                                    |
| Coordination  | Action delivery leads are Scottish Water and Dundee City Council and coordination will be determined once the actions have been finalised.   |

|               | Community engagement (Ref: 27008)  |
|---------------|--|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Dundee City Council in coordination with Scottish Water.   |
|               |  |

|               | Flood defence maintenance (Ref: 27009)  |
|---------------|---|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.   |
| Action detail | Dundee City Council should continue to maintain the Dundee (coastal) Flood<br>Protection Scheme by undertaking programmed and reactive maintenance. |
| Coordination  | Action delivery lead is Dundee City Council and coordination will be determined once the actions have been finalised.                               |

|               | 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.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

|               | Strategic mapping improvements (Ref: 27011)   |
|---------------|---|
| Action        | SEPA will continue to update flood maps based on new information.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

## What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There is an opportunity for joint working on the development of longer term Dundee City Council and Scottish Water surface water drainage strategies.

Scottish Water will explore the potential for developing a strategic drainage partnership with local authorities, SEPA and other relevant authorities to support long term sustainable drainage planning.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Newburgh

(target area 252)

# Flood risk management plan datasheet



# 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.



# 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 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.

| 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                                  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Shoreline Management Plan (Coastal Adaptive Plan) (Ref: 25201)  |
|---------------|---|
| Action        | The existing assessment of coastal flood and erosion risk is to be reviewed and<br>updated as required. The plan should include assessment of climate change and<br>develop adaptive approaches to allow for the impacts of climate change to be<br>monitored, understood and managed.                  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised   |

|               | Strategic mapping improvements (Ref: 25202)   |
|---------------|---|
| Action        | SEPA will continue to update flood maps based on new information.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

|               | 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. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

|               | 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.                         |
| Action detail | Asset owners should continue to maintain the existing coastal defences.   |
| Coordination  | Action delivery leads are Fife Council and the asset owner. Coordination will be determined once the actions have been finalised. |

|               | 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.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

#### 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<br>risk are to be identified, including natural flood management actions where suitable,<br>and a preferred approach is to be chosen. This should include adaptive planning to<br>allow for the impacts of climate change to be monitored, understood and managed.  |
| Action detail | The Newburgh flood study commissioned by Fife Council advised that a flood<br>protection scheme may be feasible in the long term. Further work is required to<br>justify the preferred option in terms of economic and qualitative benefits, and<br>progression of the scheme is subject to the availability of funding. Current and long<br>term flood risk should be considered and how the flood protection schemes and the<br>area will adapt to changes in flood risk due to climate change. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

## What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

# 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 area in this Potentially Vulnerable Area, which has been the focus of further assessment, this is identified below. Further information on the proposed 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.



# 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.

| 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<br>management and maintenance of Kinness Burn Flood<br>Protection Scheme          |
| 2573          | Avoid flood risk     | Avoid an increase in flood risk by the appropriate<br>management and maintenance of flood defences along the<br>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<br>Andrews   |
| 2576          | Reduce flood risk    | Reduce the risk of surface water flooding in St Andrews  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | Flood scheme or works design (Ref: 25701)   |
|---------------|---|
| Action        | The selected preferred approach for managing flood risk is to be designed following<br>the completion of the flood study, including consideration of the long-term impacts of<br>climate change. These can include small scale works or works to improve<br>catchment management. This should guide adaptive planning to allow for the<br>impacts of climate change to be monitored, understood and managed.  |
| Action detail | 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 remeandering 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

|               | Flood scheme or works implementation (Ref: 25702)   |
|---------------|---|
| Action        | The flood scheme/works is to be built following agreement of the design, costs and timescales.                          |
| Action detail | Procurement and construction of the Kinness Burn Flood Protection Scheme should continue following the detailed design. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.          |

|               | Surface water management plan (Ref: 25703)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed. |
| Action detail | A surface water management plan should be developed to improve understanding<br>of surface water issues. The interaction between surface water, river and coastal<br>flooding should be assessed. The plan should quantify flood risk and look at high<br>level options to manage this risk.   |
| Coordination  | Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.  |

|               | Shoreline Management Plan (Coastal Adaptive Plan) (Ref: 25704)   |
|---------------|--|
| Action        | The existing assessment of coastal flood and erosion risk is to be reviewed and<br>updated as required. The plan should include assessment of climate change and<br>develop adaptive approaches to allow for the impacts of climate change to be<br>monitored, understood and managed.                           |
| Action detail | A shoreline management plan has been produced for this area by Fife Council. The<br>plan is now operational and no review is planned in the short term. In the longer<br>term the plan will be reviewed with the latest data and adaptive approaches<br>considered in relation to the impacts of climate change. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised  |

|               | 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. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

|               | 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.                         |
| Action detail | Maintenance of the existing coastal defences at St Andrews should continue.   |
| Coordination  | Action delivery leads are Fife Council and the asset owner. Coordination will be determined once the actions have been finalised. |

|               | 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.    |
| Action detail | SEPA should maintain the Firth of Forth and Tay coastal flood warning scheme. The scheme should be investigated for improvement and/or recalibration. |
| Coordination  | Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.  |

#### What are the opportunities for joint working?

Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in a community. The potential for joint working will be further explored following the consultation feedback.

There is potential to work with SEPA's River Basin Management team to improve the physical condition of the water environment.

# 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 areas in this Potentially Vulnerable Area, which have been the focus of further assessment, these are listed below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Pitscottie and Kemback Ceres (target area 175) (target area 284)

PUBLIC



# 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.



# 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.

| Objective ref | Objective type       | Objective description  |
|---------------|----------------------|--|
| 1751          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

|               | 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.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.   |

|               | Flood defence maintenance (Ref: 17502)   |
|---------------|--|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.  |
| Action detail | Maintenance to the Pitscottie Flood Protection Scheme which runs along the Blebo<br>Burn and Ceres Burn should continue. Updates to the maintenance regime should<br>be made based on the findings of the flood study. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.   |

|               | Community engagement (Ref: 17503)  |
|---------------|--|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |
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.

#### What are the opportunities for joint working?



## 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.



#### 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.

| 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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 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.      |
| Action detail | Maintenance to the Ceres Burn and Latch Burn flood defences should continue.                                   |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised. |

#### 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.   |
| Action detail | A climate change adaptation plan should be developed in relation to management<br>of the existing defences owned by Fife Council. This is proposed as a long-term<br>action covering the Fife Council area. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?

# 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 source of flooding is the River Eden and Lady Burn, and there is also flood risk from surface water. There is a history of flooding in this location, with recent flooding recorded in 2019.

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

#### List of target areas

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

PUBLIC

# Flood risk management plan datasheet



#### 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 source of flooding in Cupar is from surface water, however there is also a risk from river 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.



#### 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.

| 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<br>management and maintenance of Millfield of Cupar Flood<br>Protection Scheme |
| 2184          | Prepare for flooding | Prepare for current flood risk and future flooding as a result of climate change in Cupar   |
| 2185          | Reduce flood risk    | Reduce the risk of river flooding from the River Eden and Lady Burn in Cupar  |
| 2186          | Reduce flood risk    | Reduce the risk of surface water flooding in Cupar  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 2028

|               | Surface water management plan (Ref: 21801)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed. |
| Action detail | Fife Council should complete the proposed surface water management plan, taking<br>into account the results of the sewer modelling. Current and long term flood risk<br>should be considered, including the performance of the existing flood protection<br>scheme, along with how the area may adapt to future flood risk.  |
| Coordination  | Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.  |

|               | Community engagement (Ref: 21802)  |
|---------------|--|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

|               | Flood defence maintenance (Ref: 21803)   |
|---------------|--|
| Action        | The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.                                |
| Action detail | Maintenance to the Millfield of Cupar Flood Protection Scheme should continue and updates to the maintenance regime be made as required. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.                           |

#### 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: 21804)  |
|---------------|---|
| 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.   |
| Action detail | A climate change adaptation plan should be developed in relation to management<br>of the existing defences owned by Fife Council. This is proposed as a long-term<br>action covering the Fife Council area. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?

# 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.



#### 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.

| 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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 2028

|               | Surface water management plan (Ref: 25601)   |
|---------------|--|
| Action        | Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on<br>man-made surfaces or overwhelming the drainage system are to be identified.<br>These priority areas will provide a baseline for the identification of next steps in<br>managing water ponding or over-whelmed drainage systems. This should guide<br>adaptive planning to allow for the impacts of climate change to be monitored,<br>understood and managed. |
| Action detail | The surface water management plan should be undertaken in order to improve<br>understanding of surface water flood risk in Springfield and to ascertain the<br>requirements of any future options to manage flood risk. Current and long-term<br>flood risk should be considered.  |
| Coordination  | Action delivery lead is Fife Council in coordination with Scottish Water and other actions in the area.  |

|               | 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. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

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.

#### What are the opportunities for joint working?

# 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 areas in this Potentially Vulnerable Area, which have been the focus of further assessment, these are listed below. Further information on the proposed 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.



#### 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.

| Objective ref | Objective type       | Objective description  |
|---------------|----------------------|--|
| 2381          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>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<br>Kingskettle and Kettlebridge                        |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 2028

|               | Community engagement (Ref: 23801)  |
|---------------|--|
| Action        | Community engagement is to continue to be carried out in the area by the responsible authorities to raise awareness of flood risk. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

|               | Flood study (Ref: 23802)  |
|---------------|---|
| Action        | An understanding of flood risk and associated issues in the area is to be developed,<br>which may include surveys and modelling and should consider the impacts of<br>climate change on flood risk. |
| Action detail | The scheduled cycle 1 natural flood management study should continue to its conclusion.   |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?

# Flood risk management plan datasheet



## Freuchie (target area 288)



# 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.

| 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  |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 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. |
| Action detail | The cycle 1 natural flood management study is to be completed as planned. Current<br>and long term flood risk should be considered, and high level appraisal of options<br>undertaken.        |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

|               | 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. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum.                |

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.

#### What are the opportunities for joint working?

## 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 areas in this Potentially Vulnerable Area, which have been the focus of further assessment, these are listed below. Further information on the proposed objectives and actions to manage flood risk within this area is provided below.

#### List of target areas

Dunshalt Auchtermuchty (target area 173) (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.



#### 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.

| Objective ref | Objective type       | Objective description  |
|---------------|----------------------|--|
| 1731          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>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   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 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.   |
| Action detail | The scheduled natural flood management study should be carried out as planned.<br>The existing flood protection scheme should be considered for all scenarios. Current<br>and long term flood risk should be considered and how the existing flood protection<br>scheme and the area will adapt to changes in flood risk due to climate change. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

|               | 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

#### 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.   |
| Action detail | A climate change adaptation plan should be developed in relation to management<br>of the existing defences owned by Fife Council. This is proposed as a long-term<br>action covering the Fife Council area. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?



## 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.



#### 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.

| Objective ref | Objective type       | Objective description  |
|---------------|----------------------|--|
| 1931          | Avoid flood risk     | Avoid inappropriate development that increases flood risk in<br>Auchtermuchty  |
| 1932          | Avoid flood risk     | Avoid an increase in flood risk by the appropriate<br>management and maintenance of Auchtermuchty Flood<br>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   |

This section provides information on the draft proposed actions for this target area. The proposed actions take account of the understanding of flood risk and the package of objectives set for the area. Actions will be coordinated to achieve maximum benefit; this will be determined once the actions have been finalised. The proposed actions are draft for consultation and are provided for comment. Your comments will help shape future flood risk management. The delivery of the proposed actions is subject to available funding and resources.

#### Actions proposed to start before June 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.  |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.   |

|               | 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. |
| Action detail | Community engagement should be carried out based on the findings of the flood studies in the area.                                 |
| Coordination  | Action delivery lead is Fife Council in coordination with the responsible authorities and the Scottish Flood Forum                 |

|               | 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

#### 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.   |
| Action detail | 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. |
| Coordination  | Action delivery lead is Fife Council and coordination will be determined once the actions have been finalised.  |

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.

#### What are the opportunities for joint working?

# Flood Risk Management Glossary July 2021



| Term                            | Definition   |
|---------------------------------|--|
| Accretion                       | Accumulation of sediment.  |
| Actions                         | Activities undertaken to reduce the impact of flooding. Actions<br>describe where and how flood risk will be managed. These actions<br>have been set by SEPA and agreed with flood risk management<br>authorities. The actions presented in the consultation are draft and<br>will be finalised after the consultation. Selection of actions to deliver<br>the agreed objectives has been based on a detailed assessment and<br>comparison of economic, social and environmental criteria.   |
| Annual Average<br>Damages (AAD) | Depending on its size or severity each flood will cause a different<br>amount of damage to a given area. Annual Average Damages are the<br>theoretical average economic damages caused by flooding when<br>considered over a very long period of time. It does not mean that<br>damage will occur every year: in many years there will be no<br>damages, in some years minor damages and in a few years major<br>damages may occur. High likelihood events, which occur more<br>regularly, contribute proportionally more to AADs than rarer events.<br>Within the flood risk management plans AADs incorporate economic<br>damages to the following receptors: residential properties, non-<br>residential properties, vehicles, emergency services, agriculture and<br>roads. They have been calculated based on the principles set out in<br>the Flood Hazard Research Centre Multi-Coloured Handbook (2010). |
| Appraisal                       | Appraisal is the process of defining objectives, examining options and<br>weighing up costs, benefits, risks and uncertainties before a decision<br>is made. The flood risk management plans appraisal method is<br>designed to set objectives and identify the most sustainable<br>combination of actions to tackle flooding from rivers, the sea and<br>surface water.   |
| Awareness raising               | Public awareness, participation and community support are essential<br>components of sustainable flood risk management. SEPA and the<br>responsible authorities have a duty to raise public awareness of flood<br>risk. This is undertaken both individually and collaboratively by a<br>range of organisations. Improved awareness of flood risk and actions<br>that prepare individuals, homes and businesses for flooding can<br>reduce overall impact.   |
| Bathing waters                  | Bathing waters are classed as protected areas under Annex IV of the Water Framework Directive (WFD). There are 84 designated bathing waters in Scotland.   |

| Term  | Definition  |
|---|---|
| Benefit cost ratio<br>(BCR)                   | A benefit cost ratio summarises the overall value for money of an action or project. It is expressed as the ratio of benefits to costs (both expressed as present value monetary values). A ratio of greater than 1:1 indicates that the economic benefits associated with an action are greater than the economic costs of implementation; therefore this is taken as the threshold of economic viability. It should be acknowledged that it is not always possible to accurately estimate economic values for all elements of benefit, and BCR is just one of a number of techniques used in appraisal.   |
| Blue infrastructure                           | Blue infrastructure is often complementary to 'green infrastructure'<br>and includes sustainable drainage systems, swales (shallow, broad<br>and vegetated channels designed to store and/or convey runoff and<br>remove pollutants), wetlands, rivers, canals (and their banks) and all<br>watercourses.   |
| Business and services                         | Properties that are not used for people to live in, such as shops or other public, commercial or industrial buildings.  |
| Catchment                                     | All the land drained by a river and its tributaries.  |
| Category 1 and 2<br>responders<br>(Cat 1 / 2) | Category 1 and 2 Responders are defined as part of the Civil<br>Contingencies Act 2004 which seeks to minimise disruption in the<br>event of an emergency. Category 1 Responders are 'core'<br>responders: local authorities, police, fire and rescue services,<br>ambulance service, NHS health boards, SEPA and the Maritime and<br>Coastguard Agency. Category 2 Responders are key co-operating<br>responders in support of Category 1 Responders. These include gas<br>and electricity companies, rail and air transport operators, harbour<br>authorities, telecommunications providers, Scottish Water, the Health<br>and Safety Executive and NHS National Services Scotland. |
| Channel<br>improvement                        | Where work has been carried out on the river's channel allowing an increase in the volume of water it can carry.  |
| Characterisation                              | Provides a description of the natural characteristics of catchments, coastlines and urban areas in terms of hydrology, geomorphology, topography and land use. It also includes the characterisation of existing levels of flood risk and existing flood risk management activity.  |
| Coastal flooding                              | Flooding that results from high sea levels or a combination of high sea<br>levels and stormy conditions. The term coastal flooding is used under<br>the Flood Risk Management (Scotland) Act 2009, but in some areas it<br>is also referred to as tidal flooding and covers areas such as estuaries<br>and river channels that are influenced by tidal flows.   |
| Combined sewer                                | Combined sewers transport sewage from homes and industry as well<br>as carrying surface water runoff from gutters, drains and some<br>highways. Heavy or prolonged rainfall can rapidly increase the flow in<br>a combined sewer until the amount of water exceeds sewer capacity.  |
| Combined sewer<br>(overflow) (CSO)            | Combined sewer overflows are purposely designed structures to<br>ensure any excess water from sewerage systems is discharged in a<br>controlled way and at a specific managed location.   |

| Term                                     | Definition  |
|--|---|
| Community facility                       | Within the flood risk management plans this term includes: Emergency<br>Services (Police, Fire, Ambulance, Coastguard, and Mountain Rescue)<br>Educational Buildings (crèche, nursery, primary, secondary, further,<br>higher and special education premises) Healthcare facilities: hospitals,<br>health centres and residential care homes.   |
| Community flood<br>action groups         | Community flood action groups are community based resilience<br>groups which, on behalf of local residents and business, help to<br>prepare for and minimise the effects of flooding. They reflect the<br>interests of their local communities and may differ in composition<br>and remit. There are over 60 groups already established in Scotland.<br>The Scottish Flood Forum provides support for both new and<br>existing groups.  |
| Confluence                               | Where two or more rivers meet.  |
| Conveyance                               | Conveyance is a measure of the carrying capacity of a watercourse.<br>Increasing conveyance enables flow to pass more rapidly and<br>reducing conveyance slows flow down. Both actions can be effective<br>in managing flood risk depending on local conditions.  |
| Cross Border<br>Advisory Group<br>(CBAG) | The Cross Border Advisory Group is a statutory group made up of<br>representatives from the Environment Agency, SEPA, Scottish Water<br>and the four lead local flood authorities located within the Solway<br>Tweed River Basin District.  |
| Cultural heritage site                   | Historic Environment Scotland maintains lists of buildings of special<br>architectural or historic interest; these buildings are referred to as<br>'listed buildings'. The highest level of designation is a World Heritage<br>Site. Other designations included in this assessment are scheduled<br>monuments, gardens and designed landscapes, and battlefields.  |
| Culvert                                  | A pipe, channel or tunnel used for the conveyance of a watercourse or<br>surface drainage water under a road, railway, canal or other obstacle.   |
| Damages                                  | Flood damages are categorised as direct or indirect i.e. as a result of<br>the flood water itself, or subsequent knock on effects. Damage to<br>buildings and contents caused by flood water are an example of direct<br>damages, whilst loss of industrial production, travel disruption or<br>stress and anxiety are indirect. Some damages can be quantified in<br>monetary terms, and others can only be described.<br>The potential damages avoided by implementation of a flood risk<br>management action are commonly referred to as the benefits of that<br>action. When comparing the effectiveness of different actions, it is<br>useful to consider estimated damages and damages avoided across<br>the lifespan of the action. Within the flood risk management plans, a<br>100 year appraisal period has been used as standard. This allows<br>costs, damages and benefits across this time frame to be compared<br>in present value terms.<br>See also 'Annual Average Damages' |

| Demountable | A temporary flood barrier is one that is only installed when the need    |
|-------------|--|
| defences    | arises, that is, when flooding is forecast. A demountable flood          |
|             | defence is a particular type of temporary defence that requires built-in |
|             | parts and therefore can only be deployed in one specific location.       |

| Term  | Definition   |
|---|--|
| Deposition  | A natural process leading to an accumulation of sediment on a river bed, floodplain or coastline.  |
| Economic Impact   | An assessment of the economic value of the positive and negative effects of flooding and/or the actions taken to manage floods.  |
| Embankment  | Flood embankments are engineered earthfill structures designed to<br>contain high river levels or protect against coastal flooding. They are<br>commonly grass-covered, but may need additional protection against<br>erosion by swiftly flowing water, waves or overtopping.  |
| Emergency plans /<br>response   | Emergency response plans are applicable for all types of flooding.<br>They set out the steps to be taken during flooding in order to<br>maximise safety and minimise impacts where possible. Under the Civil<br>Contingencies Act, Category 1 Responders have a duty to maintain<br>emergency plans. Emergency plans may also be prepared by<br>individuals, businesses, organisations or communities. |
| Environmental<br>Impact   | A change in the environment as a result of an action or activity.<br>Impacts can be positive or negative and may vary in significance,<br>scale and duration.  |
| Environmental<br>Impact<br>Assessment (EIA)   | Environmental Impact Assessment (EIA) is a process which identifies<br>the potential environmental impacts, both negative and positive, of a<br>proposal.  |
| Environmental<br>sites /<br>environmental<br>designated areas/<br>environmentally<br>designated sites | Areas formally designated for environmental importance, such as<br>Sites of Special Scientific Interest (SSSI) Special Protection Area<br>(SPA) or Special Areas of Conservation (SAC).  |
| Episodic erosion  | Erosion induced by a single event, such as a storm.  |
| Erosion   | A natural process leading to the removal of sediment from a river bed, bank, floodplain or coastline.  |
| Estuarine surge<br>attenuation  | A reduction in the wave energy caused by storm surge. Breakwaters<br>(barriers built out into the sea to protect a coast or harbour from the<br>force of waves) or habitats such as saltmarsh can slow down and<br>reduce the inland impact of storm surges (the rising of the sea due to<br>wind and atmospheric pressure changes associated with storms),<br>thereby reducing coastal flood risk.    |
| Estuary   | A coastal body of water usually found where a river meets the sea; the part of the river that is affected by tides.  |
| Fault (fault line)  | A break or fracture in the earth's crust as a result of the displacement<br>of one side with respect to the other. In Scotland the Great Glen Fault<br>is a major geological fault line cutting diagonally across the Highlands<br>from Fort William to Inverness.   |

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

| Term               | Definition   |
|--------------------|--|
| Flashy watercourse | A 'flashy' river or watercourse has a short lag time (the delay between<br>peak rainfall intensity and peak river discharge), high peak discharge,<br>and quickly returns to average flow. Rivers with these characteristics<br>can be prone to flooding and leave a short time for warning or actions.  |
| Flood              | In the terms of the Flood Risk Management Act, 'flood' means a<br>temporary covering by water, from any source, of land not normally<br>covered by water. This does not include a flood solely from a<br>sewerage system, as a result of normal weather or infrastructure<br>drainage. A flood can cause significant adverse impacts on people,<br>property and the environment.   |
| Flood bund         | A constructed retaining wall, embankment or dyke designed to protect against flooding to a specified standard of protection.   |
| Flood defence      | Infrastructure, such as flood walls and embankments, intended to protect an area against flooding, to a specified standard of protection.  |
| Flood extent       | The area that has been affected by flooding, or is at risk of flooding from one or more sources for a particular likelihood.   |
| Flood forecasting  | SEPA operates a network of over 250 rainfall, river and coastal<br>monitoring stations throughout Scotland that generate data 24 hours a<br>day. This hydrological information is combined with meteorological<br>information from the Met Office. A team of experts then predict the<br>likelihood and timing of river, coastal and surface water flooding. This<br>joint initiative between SEPA and the Met Office forms the Scottish<br>Flood Forecasting Service. |
| Flood frequency    | The probability that a particular size/severity of flood will occur in a given year (see likelihood).  |
| Flood gate         | An adjustable, sometimes temporary, barrier used as a flood defence<br>to control the flow of water within a water system or during a flood.<br>Flood gates can also be part of operational flood defences or protect<br>individual buildings or sites.  |
| Flood guard        | Flood guards cover a variety of types of door and window barriers that<br>can be fitted to individual properties and operated by the owners /<br>occupiers prior to a flood event. They act as a physical barrier to water<br>entering the property and can provide protection against frequent and<br>relatively shallow flooding.  |
| Flood hazard       | In terms of the Flood Risk Management Act, hazard refers to the characteristics (extent, depth, velocity) of a flood.  |
| Flood hazard map   | Flood hazard maps are required by the Flood Risk Management Act<br>to show information that describes the nature of a flood in terms of<br>the source, extent, water level or depth and, where appropriate,<br>velocity of water. Flood hazard and risk maps are referred to<br>collectively as flood maps and are available on the SEPA website.  |

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

| Term   | Definition  |
|--|---|
| Flood Prevention<br>(Scotland) Act 1961                      | The Flood Prevention (Scotland) Act 1961 gave local authorities discretionary powers to make and build flood prevention schemes. It was superseded by the Flood Risk Management (Scotland) Act 2009.  |
| Flood protection study                                       | Flood protection studies aim to refine understanding of the hazard and risk associated with flooding in a particular area, catchment or coastline. They will involve detailed assessment of flood hazard and / or risk and may develop options for managing flood risk.   |
| Flood protection<br>works                                    | Flood protection works can include the same flood defence measures<br>that would make up a formal Flood Protection Scheme but without the<br>legal process, protections and requirements that would come by<br>delivering the works as a scheme.  |
| Flood risk   | A measure of the combination of the likelihood of flooding occurring<br>and the associated impacts on people, the economy and the<br>environment.   |
| Flood Risk<br>Assessment                                     | Flood Risk Assessments are detailed studies of an area where flood<br>risk may be present. These are often used to inform planning<br>decisions, may help to develop flood schemes and have also<br>contributed to the National Flood Risk Assessment.  |
| Flood Risk<br>Management<br>(Scotland) Act 2009<br>(FRM Act) | The flood risk management legislation for Scotland. It transposes the EC Floods Directive into Scots Law and aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity.  |
| Flood risk<br>management cycle                               | Under the Flood Risk Management Act, flood risk management<br>planning is undertaken in six year cycles. The first planning cycle is<br>2015 – 2021. The first delivery cycle is lagged by approximately 6<br>months and is from 2016-2022.   |
| Flood Risk<br>Management Local<br>Advisory Groups            | Flood risk management local advisory groups are stakeholder<br>groups convened to advise SEPA and lead local authorities in the<br>preparation of flood risk management plans. SEPA and lead local<br>authorities must have regard to the advice they provide.  |
| Flood Risk<br>Management Plan<br>(FRM Plans)                 | A term used in the Flood Risk Management Act. Flood risk<br>management plans set out a long-term vision for the overall<br>management of flood risk. They contain a summary of flood risk in<br>each Local Plan District, together with information on catchment<br>characteristics and a summary of objectives and actions within<br>Potentially Vulnerable Areas. |
| Flood Risk<br>Management<br>Strategy (FRM<br>Strategy)       | The term used for the first set of flood risk management plans, which<br>were published in December 2015. These are now referred to as the<br>flood risk management plans to keep consistency with the Flood Risk<br>Management Act and other areas of the UK.  |

| Flood risk map     | Complements the flood hazard maps published on the SEPA website<br>providing detail on the impacts of flooding on people, the economy<br>and the environment. Flood hazard and risk maps are referred to<br>collectively as flood maps and are available on the SEPA website. |
|--------------------|---|
| Flood wall         | A flood defence feature used to defend an area from flood water to  |
|                    | a specified standard of protection.   |
| Flood Warning      | A Flood Warning target area is where SEPA operates a formal   |
| Target Area (FWTA) | Flood Monitoring Scheme to issue targeted flood warning messages for properties located in the area   |
|                    | messages for properties located in the area.  |

| Term                                   | Definition   |
|--|--|
| Flood warning<br>scheme                | A flood warning scheme is the network of monitoring on a coastal stretch or river, which provides SEPA with the ability to issue flood warnings.   |
| Floods directive                       | European Directive 2007/60/EC on the Assessment and Management<br>of Flood Risks builds on and is closely related to the Water Framework<br>Directive (see river basin management planning). It was transposed<br>into Scots Law by the Flood Risk Management (Scotland) Act 2009.<br>The Directive requires Member States to assess if all watercourses<br>and coastlines are at risk from flooding, to map the flood extent, assets<br>and humans at risk in these areas and to take adequate and<br>coordinated measures to reduce this flood risk. |
| Floodplain                             | Area of land that borders a watercourse, an estuary or the sea, over<br>which water flows in time of flood, or would flow but for the presence<br>of flood defences and other structures where they exist.   |
| Floodplain storage                     | Floodplains naturally store water during high flows. Storage can be increased through natural or man-made features to increase flood depth or slow flows in order to reduce flooding elsewhere.  |
| Fluvial flooding                       | Flooding from a river or other watercourse.  |
| Gabion                                 | A metal cage filled with rocks often used in river bank protection.  |
| Green infrastructure                   | The European Commission defines green infrastructure as "the use of ecosystems, green spaces and water in strategic land use planning to deliver environmental and quality of life benefits. It includes parks, open spaces, playing fields, woodlands, wetlands, road verges, allotments and private gardens. Green infrastructure can contribute to climate change mitigation and adaptation, natural disaster risk mitigation, protection against flooding and erosion as well as biodiversity conservation." See also 'blue infrastructure'.       |
| Groundwater<br>flooding                | This type of flooding is caused by water rising up from underlying rocks or flowing from springs. In Scotland groundwater is generally a contributing factor to flooding rather than the primary source.   |
| Integrated<br>catchment<br>study (ICS) | In urban areas, the causes of flooding are complex because of the interactions between rivers, surface water drainage and combined sewer systems and tidal waters. Scottish Water works with SEPA and local authorities to assess these interactions through detailed studies.   |

| Land use planning<br>(LUP) | The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups. |
|----------------------------|--|
| Lead local authority       | A local authority responsible for leading the production, consultation, publication and review of a Local flood risk management plan.  |

| Term   | Definition  |
|--|---|
| Likelihood of<br>flooding                                | <ul> <li>The chance of flooding occurring.</li> <li>High likelihood: A flood event is likely in the defined area on average once in every ten years (1:10). Or a 10% chance of happening in any one year.</li> <li>Medium likelihood: A flood event is likely in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.</li> <li>Low likelihood: A flood event is likely in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.</li> </ul> |
| Local Flood Risk<br>Management Plans<br>(Local FRM Plan) | Local flood risk management plans, produced by lead local<br>authorities, will take forward the objectives and actions set out in flood<br>risk management plans. They will provide detail on the funding,<br>timeline of delivery, arrangements and co-ordination of actions at the<br>local level during each six year, flood risk management planning<br>cycle.  |
| Local Nature<br>Reserve (LNR)                            | A Local Nature Reserve is a protected area of land designated by a local authority because of its local special natural interest and / or educational value. Local authorities select and designate local nature reserves using their powers under the National Parks and Access to the Countryside Act 1949.   |
| Local Plan District                                      | Geographical areas for the purposes of flood risk management planning. There are 14 Local Plan Districts (LPDs) in Scotland.  |
| Local Plan District<br>Partnerships                      | Each LPD has established a local partnership comprised of local<br>authorities, SEPA and Scottish Water and others as appropriate.<br>These partnerships are distinct from the flood risk management<br>plans local advisory groups and they retain clear responsibility for<br>delivery of the flood risk management actions set out in the Local<br>flood risk management plans. It is the local partnership that makes<br>decisions and supports the delivery of these plans.  |
| Maintenance  | Sections 18 and 59 of the Flood Risk Management (Scotland) Act 2009 put duties of watercourse inspection, clearance and repair on local authorities. In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or defences.   |
| Montane habitat  | This habitat encompasses a range of natural or near-natural vegetation occurring in the montane zone, lying above or beyond the natural tree-line.  |

| National Flood      | The National Flood Management Advisory Group provides advice and          |
|---------------------|---|
| Management          | support to SEPA and, where required, Scottish Water, local authorities    |
| Advisory Group      | and other responsible authorities on the production of flood risk         |
| (NFMAG)             | management plans and Local flood risk management plans.                   |
| National Flood Risk | A national analysis of flood risk from all sources of flooding which also |
| Assessment          | considers climate change impacts. First published in December 2011        |
| (NFRA)              | this provides the information required to undertake a strategic           |
|                     | approach to flood management that identifies areas at flood risk that     |
|                     | require further appraisal. The NFRA was reviewed and updated for the      |
|                     | second cycle of flood risk management planning in 2018.                   |

| Term                                     | Definition  |
|--|---|
| Natural flood<br>management (NFM)        | A set of flood management techniques that aim to work with natural processes (or nature) to manage flood risk.  |
| Non-residential properties               | Properties that are not used for people to live in, such as shops or other public, commercial or industrial buildings.  |
| Objectives                               | Objectives provide a common goal and shared ambition for managing<br>floods. These objectives have been set by SEPA and agreed with<br>flood risk management authorities following consultation. They were<br>identified through an assessment of the underlying evidence of the<br>causes and impacts of flooding.   |
| One in 200 year<br>flood                 | See 'likelihood of flooding' and 'return period'.   |
| Options appraisal<br>study               | An options appraisal study looks to identify and assess a range of<br>options that achieve flood risk management objectives whilst delivering<br>other economic, social and environmental benefits. This helps to<br>inform the decision-making process and identify how options work<br>together to identify a preferred option for managing flooding within an<br>area.                                     |
| Planning policies                        | Current national planning policies, Scottish Planning Policy and<br>accompanying Planning Advice notes restrict development within the<br>floodplain and limit exposure of new receptors to flood risk. In addition<br>to national policies, local planning policies may place further<br>requirements within their area of operation to restrict inappropriate<br>development and prevent unacceptable risk. |
| Potentially<br>Vulnerable Areas<br>(PVA) | Catchments identified as being at risk of flooding and where the impact of flooding is sufficient to justify further assessment and appraisal. There were 243 PVAs identified by SEPA in the 2011 National Flood Risk Assessment and were the focus of the first flood risk management planning cycle. There are 233 PVAs identified for the 2018 National Flood Risk Assessment.                             |
| Preferred option                         | A preferred option identifies the collection of flood management<br>options which combined offer the most suitable way of managing<br>flooding within an area. Based on the economic, social and<br>environmental benefits of the options.  |

| Property level protection        | Property level protection includes flood gates, sandbags and other temporary barriers that can be used to prevent water from entering individual properties during a flood.  |
|----------------------------------|--|
| Property level protection scheme | Some responsible authorities may have a formal scheme to provide, install and maintain property level protection for properties.   |
| Ramsar sites                     | Ramsar sites are wetlands of international importance designated under the Ramsar Convention.  |
| Receptor                         | Refers to the entity that may be impacted by flooding (a person, property, infrastructure or habitat). The vulnerability of a receptor can be reduced by increasing its resilience to flooding.  |
| Residual risk                    | The risk which remains after risk management and mitigation. This may include risk due to very severe (above design standard) storms or risks from unforeseen hazards.   |
| Resilience                       | The ability of an individual, community or system to recover from flooding.  |
| Responsible<br>authority         | Designated under the Flood Risk Management (Scotland) Act 2009<br>and associated legislation as local authorities, Scottish Water and,<br>from 21 December 2013, the National Park Authorities and Forestry<br>Commission Scotland. Responsible authorities, along with SEPA and<br>Scottish Ministers, have specific duties in relation to their flood risk<br>related functions. |
| Return period                    | A measure of the rarity of a flood event. It is the statistical average length of time separating flood events of a similar size. (See Likelihood).  |

| Term   | Definition   |
|--|--|
| Revetment  | Sloping structures placed on banks or at the foot of cliffs in such a way as to deflect the energy of incoming water.  |
| Riparian   | The riparian area is the interface between land and a river or stream.<br>For the purposes of flood risk management plans this commonly<br>refers to the riparian owner, which denotes ownership of the land area<br>beside a river or stream.   |
| River basin<br>management<br>planning (RBMP)                             | The Water Environment and Water Services (Scotland) Act 2003<br>transposed the European Water Framework Directive into Scots law.<br>The Act created the River Basin Management Planning process to<br>achieve environmental improvements to protect and improve our<br>water environment. It also provided the framework for regulations to<br>control the negative impacts of all activities likely to have an impact on<br>the water environment. |
| Runoff reduction   | Actions within a catchment or sub-catchment to reduce the amount of runoff during rainfall events. This can include intercepting rainfall, storing water, diverting flows or encouraging infiltration.   |
| Scottish Advisory<br>and Implementation<br>Forum for Flooding<br>(SAIFF) | The stakeholder forum on flooding set up by the Scottish Government<br>to ensure legislative and policy aims are met and to provide a platform<br>for sharing expertise and developing common aspirations and<br>approaches to reducing the impact of flooding on Scotland's<br>communities, environment, cultural heritage and economy.   |

| Sediment balance  | Within a river where erosion and deposition processes are equal over<br>the medium to long-term resulting in channel dimensions (width, depth,<br>slope) that are relatively stable.  |
|---|---|
| Sediment<br>management  | Sediment management covers a wide range of activities that includes<br>anything from the small scale removal of dry gravels to the dredging of<br>whole river channels and the reintroduction of removed sediment into<br>the water environment. Historically, sediment management has been<br>carried out for several reasons, including reducing flood risk, reducing<br>bank erosion, for use as aggregate and to improve land drainage. |
| Self help   | Self help actions can be undertaken by any individuals, businesses,<br>organisations or communities at risk of flooding. They are<br>applicable to all sources, frequency and scales of flooding. They<br>focus on awareness raising and understanding of flood risk.   |
| Sewer flooding (and<br>other artificial<br>drainage system<br>flooding) | Flooding as a result of the sewer or other artificial drainage system<br>(e.g. road drainage) capacity being exceeded by rainfall runoff or<br>when the drainage system cannot discharge water at the outfall due to<br>high water levels (river and sea levels) in receiving waters.   |
| Site protection plans   | Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network.   |
| Shoreline<br>Management Plan<br>(SMP)                                   | A Shoreline Management Plan is a large scale assessment of the coastal flood and erosion risks to people and the developed, historic and natural environment. It sets out a long-term framework for the management of these risks in a sustainable manner.  |
| Site of Special<br>Scientific Interest<br>(SSSI)                        | Sites of Special Scientific Interest are protected by law under the Nature Conservation (Scotland) Act 2004 to conserve their plants, animals and habitats, rocks and landforms.  |

| Term                                  | Definition   |
|---------------------------------------|--|
| Source of flooding                    | The type of flooding. This can be coastal, river, surface water or groundwater.  |
| Special Area of<br>Conservation (SAC) | Special Areas of Conservation are strictly protected sites designated<br>under the European Habitats Directive. The Directive requires the<br>establishment of a European network of protected areas which are<br>internationally important for threatened habitats and species. |
| Special Protection<br>Areas (SPA)     | Special Protection Areas are strictly protected sites classified in accordance with the European Birds Directive. They are classified for rare and vulnerable birds (as listed in the Directive), and for regularly occurring migratory species.                                 |
| Standard of protection (SoP)          | All flood protection structures are designed to be effective up to a specified flood likelihood (Standard of Protection). For events beyond this standard, flooding will occur. The chosen Standard of Protection will determine the required defence height and / or capacity.  |
| Storage area                          | A feature that can be used to store floodwater, this can be natural in<br>the form of low lying land or manmade such as a reservoir or modified<br>landform.   |

| 0  | A process for the early identification and assessment of the likely   |
|--|---|
| Environmental  | significant environmental effects, positive and negative, of activities.  |
| Assessment (SEA)   | Often considered before actions are approved or adopted.  |
| Strategic Flood Risk   | A Strategic Flood Risk Assessment is designed for the purposes of   |
| Assessment (SFRA)  | specifically informing the Development Plan Process. A SFRA   |
|  | involves the collection, analysis and presentation of all existing and  |
|  | readily available flood risk information (from any source) for the area   |
|  | of interest. It constitutes a strategic overview of flood risk.   |
| Strategic mapping  | Strategic mapping improvement actions have been identified in   |
| improvements   | locations where SEPA is planning to undertake additional modelling or   |
|  | analysis of catchments and coastlines, working collaboratively with   |
|  | local authorities where appropriate, to improve the national  |
|  | understanding of flood risk.  |
| Surcharge  | Watercourses and culverts can carry a limited amount of water. When   |
| Caronargo  | they can no longer cope, they overflow, or 'surcharge'  |
| Surface water  | Elooding that occurs when rainwater does not drain away through the   |
| flooding   | normal drainage systems or soak into the ground, but lies on or flows   |
| lioounig   | over the ground instead   |
| Surface Water  | A plan that takes an integrated approach to drainage accounting for all   |
| Management Plan  | aspects of urban drainage systems and produces long term and  |
| (SWMP)   | sustainable actions. The aim is to ensure that during a flood the flows   |
|  | created can be managed in a way that will cause minimum harm to   |
|  | people buildings the environment and business   |
| Surface water plan /   | The management of flooding from surface water sewers drains small   |
| study  | watercourses and ditches that occurs, primarily in urban areas, during  |
| Study  | heavy rainfall Flood risk management plan actions in this category  |
|  | include: Surface Water Management Plans Integrated Catchment  |
|  | Studies and assessment of flood risk from sewerage systems (Flood   |
|  | Risk Management Act. Section 16) by Scottish Water. These have  |
|  |   |
|  | been selected as appropriate for each Potentially Vulnerable Area   |
| Torm   | been selected as appropriate for each Potentially Vulnerable Area.  |
| Term   | been selected as appropriate for each Potentially Vulnerable Area. Definition The sustainable fload risk management approach size to most human   |
| Term<br>Sustainable flood  | been selected as appropriate for each Potentially Vulnerable Area. Definition The sustainable flood risk management approach aims to meet human   |
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| UK Climate<br>Change Projections<br>(UKCP18) | The leading source of climate change information for the UK. It can<br>help users to assess their climate risks and plan how to adapt to a<br>changing climate. The high emissions scenario refers to the RCP8.5<br>emission scenario. See the UKCP18 climate change projections report<br>for details. |
|--|---|
| Utility assets                               | Within the flood risk management plans this refers to electricity<br>sub stations, mineral and fuel extraction sites, telephone assets,<br>television and radio assets.   |
| Voe  | A dialect term, common in place names and used to refer to a small bay or creek in Orkney or Shetland.  |
| Vulnerability                                | A measure of how likely someone or something is to suffer long-term<br>damage as a result of flooding. It is a combination of the likelihood of<br>suffering harm or damage during a flood (susceptibility) and the ability<br>to recover following a flood (resilience).                               |
| Wave energy<br>dissipation                   | Process by which a wave loses its energy.   |
| Wave overtopping                             | Wave overtopping occurs when water passes over a flood wall or<br>other structure as a result of wave action. Wave overtopping may lead<br>to flooding particularly in exposed coastal locations.   |