

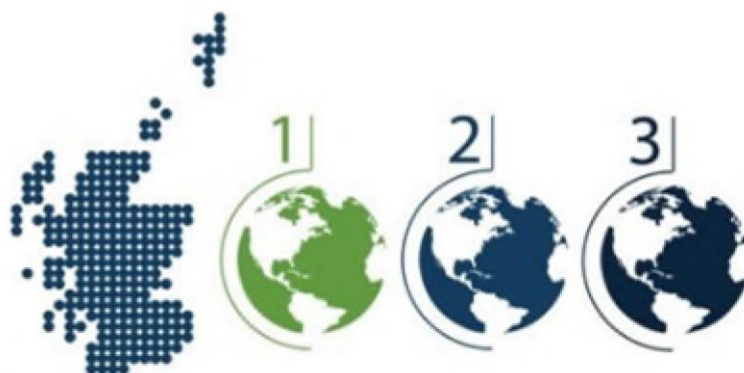


Forth Local Plan District (LPD 9)

Draft flood risk management plans 2022-2028

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07747 627671

If you wish to post your comments, please mark them for the attention of FRM consultation and send them to:

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

This document has been produced in collaboration with:



Forth Local Plan District (LPD 9)

Draft flood risk management plans 2022- 2028

The Forth Local Plan District covers around 1,600km² and has a population of approximately 130,000 people. It covers an area from the Loch Lomond and Trossachs National Park in the west to the inner Forth Estuary in the east. The west is more mountainous, with steeper slopes and valleys. The east includes several urban areas in the low-lying, flatter regions. These include Stirling, Alloa, Bridge of Allan, Dunblane, Alva, Menstrie and Tillicoultry. A short coastline of approximately 74km lies to the east.

The area is largely rural with a mixture of agriculture, grasslands and woodlands. There are many lochs and reservoirs including Loch Katrine, Loch Venachar, Lake of Menteith, Loch Lubnaig Loch Voil and Gartmorn Reservoir. The largest river is the River Forth and its tributaries the River Teith and River Devon. There are smaller watercourses in the area that drain the Ochil Hills and flow into the River Devon.

There is a river, surface water and coastal flood risk within the Local Plan District. The area was affected by several large floods, notably in December 2015 as a result of Storms Desmond and Frank and in January 2016 as a result of Storm Gertrude. More recently summer flash flooding from surface water led to widespread impacts in June and August 2019.

Currently it is estimated that there are around 15,000 people at risk from flooding and over 8,000 homes and businesses. This may increase to 23,000 people and 13,000 homes and businesses by the 2080s due to climate change. The expected annual cost of flooding over a long period of time is around £6.6 million.

SEPA lead development of the flood risk management plans for Scotland and delivery of flood warning services. Local flood risk management planning for the Forth Local Plan District is led by Stirling Council who are the lead local authority. Other responsible authorities include five more local authorities, Scottish Water, and Loch Lomond and Trossachs 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	<p>SEPA the responsible authorities and other organisations such as the Scottish Flood Forum work together to help communities understand the risk of flooding and what actions individuals can take through national and local initiatives. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact of flooding.</p> <p>Local authorities undertake additional awareness raising activities when developing any specific project proposals and will engage with community resilience groups and local communities.</p> <p>Scottish Flood Forum support flood risk communities by raising community awareness, promoting self-help, developing community groups and establish a recovery support programme after a flood.</p>

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

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

	Flood Warning Development Framework
Action	<p>SEPA will publish a new Flood Warning Development Framework by March 2022, which will detail its ambitions and strategic actions to maintain and improve our flood warning service across Scotland.</p> <p>SEPA will continue to develop the Scottish Flood Forecast, a 3 day forecast of flood risk across Scotland and bring together all live information such as flood warnings, river levels and rainfall data into a central hub easily accessible for the public.</p> <p>Working in close partnership with the Met Office through the Scottish Flood Forecasting Service, SEPA will develop its capability in surface water flooding forecasting, focusing initially on the transport sector to support climate-ready infrastructure. SEPA will also undertake a prioritised improvement programme of existing river and coastal flood warning schemes to provide more accurate forecast with improved lead time.</p>

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

	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	<p>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.</p> <p>Local authorities, SEPA and Scottish Water all have a role to support sustainable development.</p>

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

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

	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 st 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 flooding has the potential to impact more properties in Scotland than any other source of flooding. Over the next six-year cycle SEPA will look to vastly improve its national understanding of surface flood risk by undertaking a wholesale update of the national surface water maps to reflect developments in data and understanding, including the impact of climate change.

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

	Scottish Flood Defence Asset Database
Action	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. This work will start by reviewing and developing our understand of how and when Scotland's flood defence assets can be adapted to continue to provide vital protection from flooding in the future.

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

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 ([link](#)). 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 eight Potentially Vulnerable Areas (PVA) in this Local Plan District. Following sections provide more information on these areas.

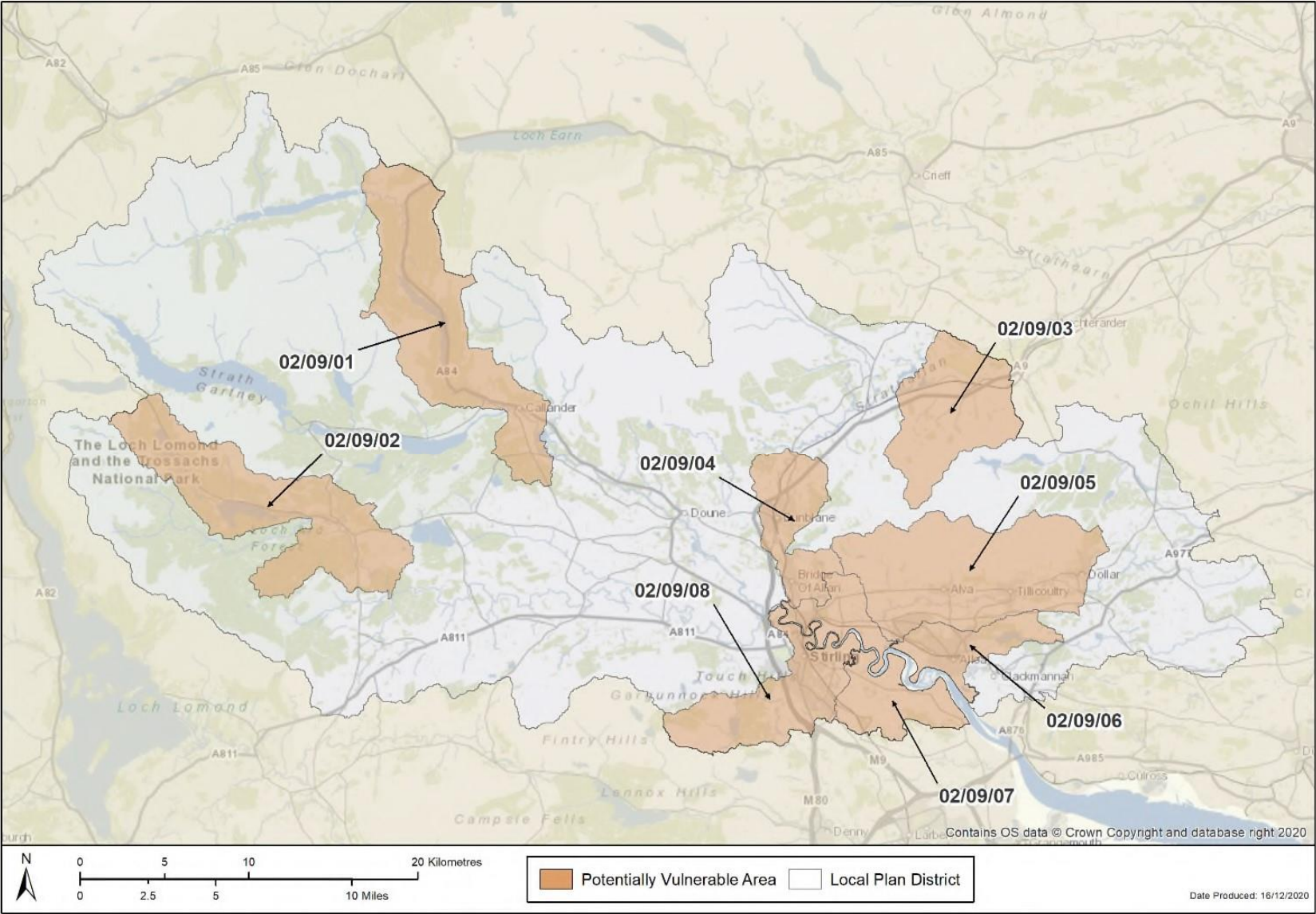


Figure 1. Potentially Vulnerable Areas in Forth Local Plan District

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

PVA Ref	PVA NAME	Local authority
02/09/01	Callander	Stirling
02/09/02	Aberfoyle	Stirling
02/09/03	Blackford	Perth & Kinross
02/09/04	Dunblane and Bridge of Allan	Stirling
02/09/05	Hillfoots Villages	Clackmannanshire
02/09/06	Alloa	Clackmannanshire
02/09/07	South Alloa	Falkirk
02/09/08	Stirling	Stirling

02/09/01 (Callander)

This area is designated as a Potentially Vulnerable Area due to flood risk to Callander, Strathyre and the A84. The main source of flooding in Callander is the River Teith and its tributaries, and there is also a risk of flooding from surface water. There is a long history of frequent flooding in this area. A number of river and surface water floods have been recorded over the last decade, and throughout 2020 when there was flooding of the car park in Callander and the A84.

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

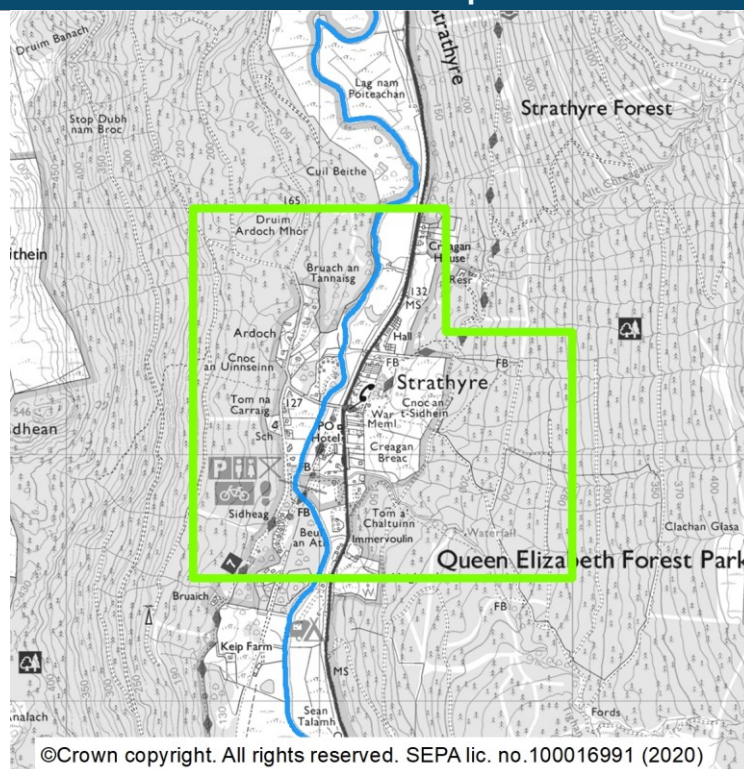
Strathyre	(target area 171)
Callander	(target area 208)

Strathyre (target area 171)

Summary

Strathyre is a village located in Stirlingshire within Loch Lomond and the Trossachs National Park. It is a new target area for inclusion in the 2021 Flood Risk Management Plans. The main source of flooding in Strathyre is river flooding, however there is also a risk of combined surface water and river flooding to the roads. There are approximately 80 people and 40 properties at risk from flooding. This is estimated to increase to 100 people and 50 properties by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is the main source of flood risk information in this area. There have been a number of floods recorded in this area. Flooding from the River Balvag caused damage to homes, gardens and agricultural land in 2006 and flooded businesses in Strathyre in 2015. There are also records of floods arising from small watercourses and runoff from the surrounding hillside since 2015.

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
1711	Avoid flood risk	Avoid inappropriate development that increases flood risk in Strathyre
1712	Avoid flood risk	Avoid an increase in flood risk in Strathyre by the appropriate protection, management and maintenance of the floodplain between Balquhiddy and Strathyre
1713	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Strathyre
1714	Reduce flood risk	Reduce the risk of surface water flooding to local access roads in Strathyre
1715	Reduce flood risk	Reduce the risk of river flooding from the River Balvag and Loch Lubnaig in Strathyre and to A84

What actions are proposed for this area?

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: 17101)	
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 study should quantify the flood risk from surface water and river sources identifying all flooding mechanisms and interactions between sources. If flood risk is confirmed, a scoping study should be carried out to assess options to manage flood risk in this community.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood warning scoping (Ref: 17102)	
Action	The potential to provide a new flood warning scheme is to be considered by SEPA. Flood warnings are only effective where it is possible to send a warning message with sufficient time to allow communities to take appropriate actions before flooding occurs.
Action detail	Scoping for a river flood warning scheme will be carried out in Strathyre.
Coordination	Action delivery lead is SEPA and coordination will be determined once the action has been finalised.

Community engagement (Ref: 17103)	
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 study.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Community resilience group (Ref: 17104)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	The Strathyre community resilience group should continue its work, including keeping the community resilience plan up to date, supported by Stirling Council. The resilience group operate a sandbag store. Local hydrometry information for the River Balvag is supplied by the council, and the group receive communications from the council when poor weather is anticipated.
Coordination	Action delivery lead is the community and coordination will be determined once the actions have been finalised.

Land Use Planning (Ref: 17105)

Action	Planning authority should ensure that their development plan and planning decision-making supports delivery of sustainable flood management.
Action detail	A Local Development Plan is required for each council area across Scotland. It allocates sites, either for new development, such as housing, or sites to be protected. It also includes policies that guide decisions on all planning applications. In this area, SEPA and Stirling Council should agree how the protection, management and maintenance of the floodplain between Balquhiddy and Strathyre can be protected through the local development planning process.
Coordination	Action delivery lead is Stirling 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?

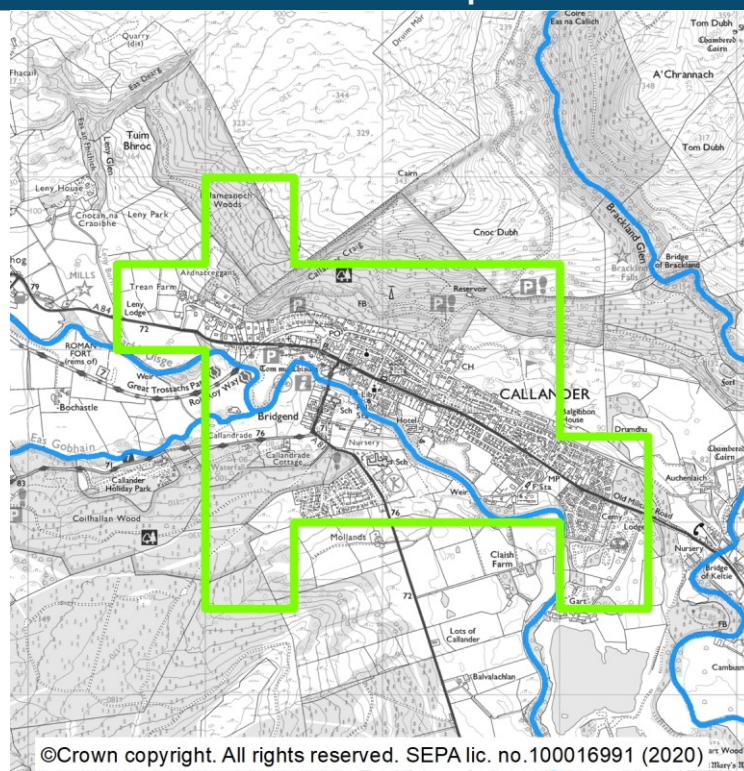
Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in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

Callander (target area 208)

Summary

Callander is a small town in the Loch Lomond and the Trossachs National Park, within the Stirling Council area. The main source of flooding in Callander is river flooding, however there is also risk from surface water. There are approximately 190 people and 120 homes and businesses currently at risk from flooding. This is likely to increase to 330 people and 210 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment for river flooding is improved by a flood study carried out by the local authority in support of the Callander Flood Protection Scheme. The national understanding of surface water flooding is improved by a surface water management plan and a sewer flood risk assessment carried out by the local authority and Scottish Water. There is a long history of flooding in Callander with frequent records of flooding from the River Teith and surface water. There are recent records of flooding including in December 2019 when surface water flooding resulted in damage to businesses and during January 2020 when flooding caused damage to homes and businesses.

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
2081	Avoid flood risk	Avoid inappropriate development that increases flood risk in Callander
2082	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Callander Flood Protection Scheme
2083	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Callander
2084	Reduce flood risk	Reduce the risk of river flooding from the River Teith in Callander
2085	Reduce flood risk	Reduce the risk of surface water flooding in Callander

What actions are proposed for this area?

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 scheme or works design (Ref: 20801)
Action	The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The detailed design for the Callander Flood Protection Scheme is being progressed. Current and long term flood risk should be considered and how the flood protection scheme will adapt to changes in flood risk due to climate change.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

	Flood scheme or works implementation (Ref: 20802)
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Action detail	The Callander Flood Protection Scheme has been allocated funding as part of flood risk management cycle 1 and should proceed to construction following the detailed design.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

	Community engagement (Ref: 20803)
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	Awareness raising and continued engagement should be developed based on development of the flood protection scheme and findings of the surface water management plan. This aims to ensure that the scheme is carried out in conjunction with community engagement where issues, constraints, aspirations and opportunities are identified.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Surface water management plan (Ref: 20804)

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	Stirling Council should continue development and implementation of the surface water management plan. This should be reviewed and updated regularly, and the results of sewer modelling should be considered.
Coordination	Action delivery lead is Stirling Council and coordinated with Scottish Water and other actions in the area.

Flood defence maintenance (Ref: 20805)

Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Action detail	Stirling Council should commence the inspection and maintenance regime for the Callander Flood Protection Scheme once completed.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 20806)

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 Teith flood warning scheme. The scheme should be investigated for improvement and/or recalibration as part of the Upper Forth project.
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.

02/09/02 (Aberfoyle)

This area is designated as a Potentially Vulnerable Area due to flood risk to Aberfoyle and the A821. The main source of flooding is the River Forth and Duchray Water, with some risk of flooding from surface water. There is a long history of flooding in Aberfoyle, with recent river and surface water floods.

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

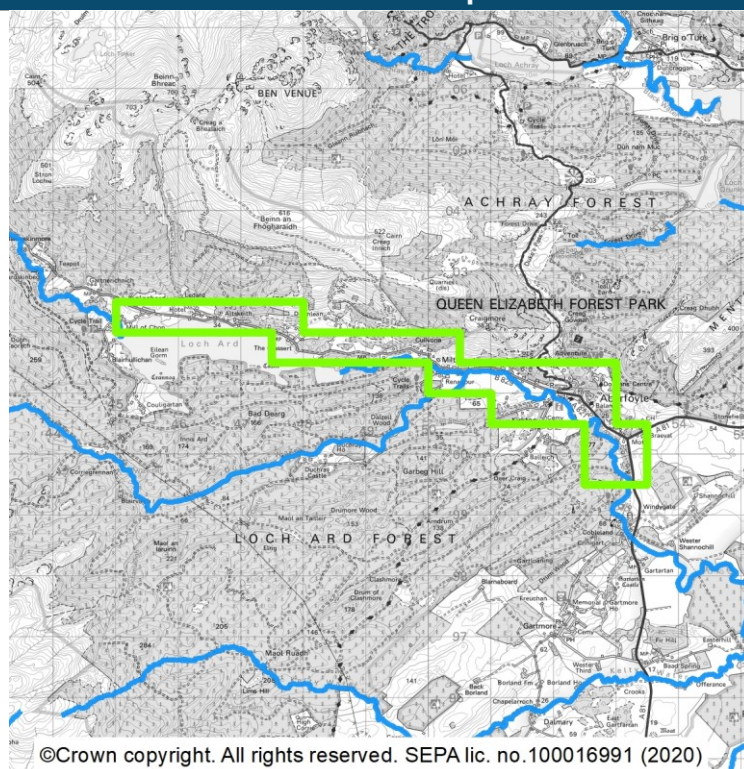
Aberfoyle (target area 184)

Aberfoyle (target area 184)

Summary

Aberfoyle is a village located within the Stirling Council area and the Loch Lomond and Trossachs National Park. The area extends from Aberfoyle up the B829, along the north shore of Loch Ard to Kinlochard. The main source of flooding in Aberfoyle is river flooding, however there is also a risk of surface water flooding. There are approximately 250 people, and 160 homes and businesses currently at risk of flooding. This is likely to increase to 260 people, and 170 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national assessment for river flooding is improved by a local authority flood study in support of the Aberfoyle Flood Protection Scheme (2019). The study considers the River Forth, Duchray Water and their tributaries in the local area. There is a long history of flooding in the Aberfoyle area with frequent flooding to roads occurring between 3 to 6 times annually. Roads, homes and businesses have been impacted by floods in December 2006, August 2009, November 2012, December 2015, January 2016, and February 2020. A recent flood was recorded in August 2020 when flooding caused road closures cutting off rural communities for a day. A further recent flood was recorded in February 2021.

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
1841	Avoid flood risk	Avoid inappropriate development that increases flood risk in Aberfoyle
1842	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Aberfoyle
1843	Reduce flood risk	Reduce the risk of river flooding from the River Forth and Duchray Water in Aberfoyle and the A821 and B829.
1844	Reduce flood risk	Reduce the risk of surface water flooding on the A821 and B829

What actions are proposed for this area?

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 scheme or works design (Ref: 18401)
Action	The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The outline design for Aberfoyle Flood Protection Scheme has been completed with some elements at a detailed design. The scheme incorporates flood defences, floodplain connectivity measures, a solution for surface water drainage behind defences and protection measures against erosion. It also proposes potential additional catchment wide measures such as peatbog restoration, wetland creation and tree planting. Impacts of flooding in this location include additional social, commercial and amenity considerations. In further development of the scheme, current and long term flood risk should be considered and how the flood protection scheme will adapt to changes in flood risk due to climate change.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

	Flood scheme or works implementation (Ref: 18402)
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 viable option for managing flood risk in this community. The delivery of this action is subject to funding being made available. Once detailed design is complete the Aberfoyle Flood Protection Scheme should progress to the procurement and construction phase.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Surface water management plan (Ref: 18403)

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	Stirling Council should develop and implement a surface water management plan for Aberfoyle in order to better understand surface water flood risk and mechanisms, and in the longer term look at possible action to manage the risk. The main risk of surface water is to the roads, notably the A821 and B829.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Community engagement (Ref: 18404)

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	Awareness raising and community engagement is being carried out through community projects. Stirling Council will continue to keep the community aware of progress with flood protection scheme development and will arrange more detailed further engagement as may be required. This aims to ensure that the scheme is carried out in conjunction with community engagement where issues, constraints, aspirations and opportunities are identified.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Community resilience group (Ref: 18405)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	Aberfoyle Community Council have a flood resilience function and will continue its activities in engaging and liaising with the community, the Loch Lomond and the Trossachs National Park and Stirling Council. Stirling Council should continue to support the community and provide information and assistance. Where communities are prepared to develop community resilience plans the council facilitate development of the plans and provide a stock of sandbag replacements for emergency use as part of the plan. At present these resources are distributed by Trossachs search and rescue on behalf of the council in lieu of a community resilience plan.
Coordination	Action delivery lead is the community and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 18406)

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 Aberfoyle 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 an opportunity to work jointly with the Strathard Initiative. The Strathard Initiative is an environmental project looking at a range of natural flood management and environment restoration options that could help manage flooding in the area. The options include, for example, runoff control and sediment management. The project is a collaborative initiative that includes a number of agencies and local communities.

02/09/03 (Blackford)

This area is designated as a Potentially Vulnerable Area due to flood risk to Blackford from the Allan Water and small watercourses including Burn of Ogilvie and the Danny Burn. There is some history of flooding. Recently, the A9 in this area flooded during Storm Dennis in 2020.

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

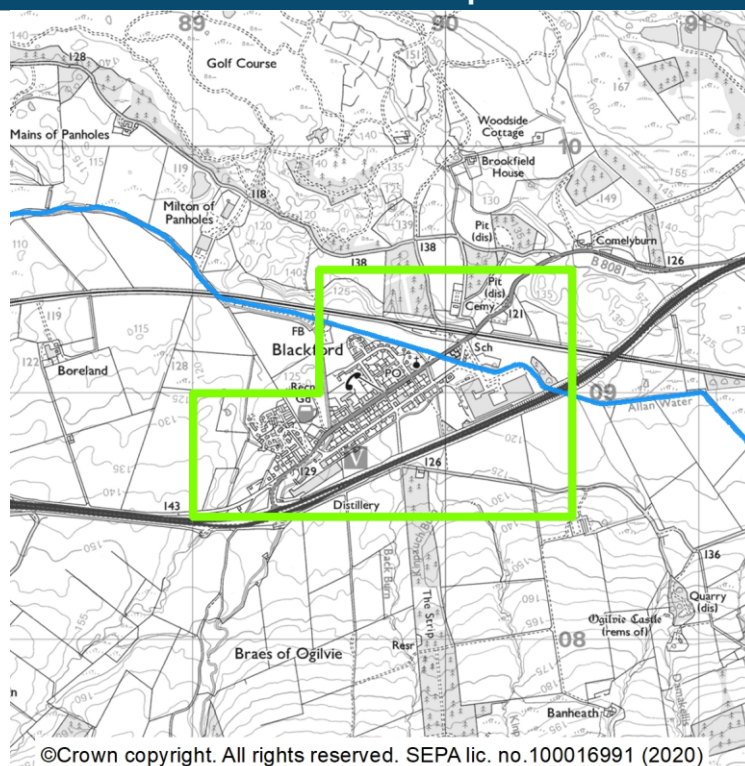
Blackford (target area 198)

Blackford (target area 198)

Summary

The village of Blackford is located around 8km from Auchterarder and within the Perth and Kinross Council area. The main source of flooding in Blackford is river flooding from the Danny Burn and small watercourses. The local authority has carried out a flood study in this area which estimated that there are approximately 32 homes and 6 businesses currently at risk from flooding.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national assessment for river flooding is improved by the Blackford Flood Study. There are records of flooding in this area. On 13 December 2006 properties in Abercairney Place, Blackford and surrounding areas were flooded. Recent notable floods include August 2019 and February 2020. In February 2020, 2 homes and 1 business flooded following Storm Dennis.

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
1981	Avoid flood risk	Avoid development that increases flood risk in Blackford
1982	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Blackford
1983	Reduce flood risk	Reduce the risk of river flooding from the Allan Water, Danny Burn, Burn of Ogilvie, Back Burn and Kinpauch Burn in Blackford.

What actions are proposed for this area?

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 protection scheme (Ref: 19801)	
Action	The selected preferred approach for managing flood risk is to be designed, including consideration of the long-term impacts of climate change. The flood scheme is to be built once statutory approval has been secured.
Action detail	A flood protection scheme has been proposed in this area. The proposed scheme involves a combination of river flow diversions, direct flood defences and natural flood management. It aims to provide a 1 in 200 year standard of protection. Current and long term flood risk should be further considered at the design stage including the impacts of climate change and scheme adaptability. The outline design for the Blackford Flood Protection Scheme should be progressed, in line with the recommendations of the Blackford Flood Study. This work will also include ongoing community engagement as the project progresses. The responsible authority proposes this action as the best viable option for managing flood risk in this community. The delivery of this action is subject to funding being made available. Once the flood protection scheme has been confirmed and the detailed design completed, the next stages will involve procurement and construction. As built drawings should be made available to SEPA, for inclusion in the Scottish Flood Defence Asset Database, flood map updates and flood warning scheme updates. Routine inspections and maintenance of the Blackford Flood Protection Scheme would commence when the scheme is complete in accordance with the inspection and maintenance regime.
Coordination	The action delivery lead is Perth and Kinross Council. The Blackford Flood Protection Scheme will be coordinated through the Forth Local Plan District Partnership. The flood protection scheme will be coordinated with other related actions.

Community engagement (Ref: 19802)	
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. Perth and Kinross Council will continue to coordinate with the Blackford Community Council on a priority needs basis where resources allow.
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.

Community resilience group (Ref: 19803)	
Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	Perth and Kinross Council will continue to communicate with and support the Blackford Community Council on flood risk matters. The resilience plans should be updated regularly by the group and this will be supported by the Council.
Coordination	The action delivery lead is the community. Perth and Kinross Council will continue to coordinate with the Blackford Community Council on a priority needs basis where resources allow.

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.

02/09/04 (Dunblane and Bridge of Allan)

This area is designated as a Potentially Vulnerable Area due to flood risk to Dunblane and Bridge of Allan from the Allan Water and surface water. Existing flood protection schemes offers protection against frequent river flooding in Bridge of Allan. There is a long history of flooding in this area, with recent river flooding during Storm Dennis.

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

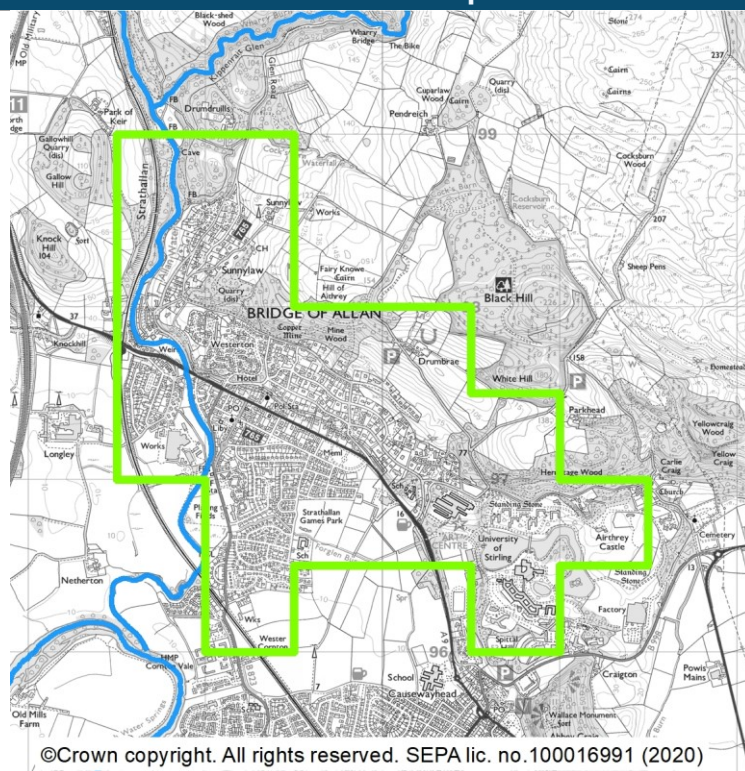
Bridge of Allan	(target area 204)
Dunblane	(target area 223)

Bridge of Allan (target area 204)

Summary

Bridge of Allan is located just north of Stirling within the Stirling Council area. The main source of flooding is river flooding from the Allan Water, however there is also a risk from surface water. There are approximately 1,100 people and 540 homes and businesses currently at risk from flooding. This is likely to increase to 3,100 people and 1,500 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment for river flooding is improved by a flood study for Bridge of Allan carried out by the local authority in support of the Bridge of Allan Flood Protection Scheme. Understanding of surface water flooding is improved by an integrated catchment study, a surface water management plan and a sewer flood risk assessment carried out by Scottish Water and the local authority. Bridge of Allan has a long history of flooding from the Allan Water. Homes, businesses and transport have been impacted by flooding in 2006, 2012 and 2015. Recent flood in February 2020 resulted in damage to homes, businesses and transport.

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
2041	Avoid flood risk	Avoid inappropriate development that increases flood risk in Bridge of Allan
2042	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Bridge of Allan flood protection scheme
2043	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Bridge of Allan
2044	Reduce flood risk	Reduce the risk of river flooding from the Allan Water in Bridge of Allan
2045	Reduce flood risk	Reduce the risk of surface water flooding in Bridge of Allan.

What actions are proposed for this area?

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 scheme or works design (Ref: 20401)	
Action	The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The development of the Bridge of Allan Flood Protection Scheme should continue as scheduled, with the next step being detailed design. Some surface water flooding problems immediately behind the flood defences will be tackled as part of the scheme. Current and long term flood risk should be considered and how the scheme will adapt to changes in flood risk due to climate change.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood scheme or works implementation (Ref: 20402)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Action detail	The Bridge of Allan Flood Protection Scheme has been allocated funding as part of flood risk management cycle 1 and should proceed to construction once detailed design has been completed.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Community engagement (Ref: 20403)	
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	Awareness raising should be carried out based on the outcomes of the flood scheme development and surface water management plan. Engagement between Stirling Council and the community council should continue. This aims to ensure that the scheme is carried out in conjunction with community engagement where issues, constraints, aspirations and opportunities are identified.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Sewer flood risk assessment (Ref: 20404)

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 Stirling 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: 20405)

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	Stirling Council have produced a surface water management plan for the northern part of Bridge of Allan backing onto the Sheriffmuir hills in response to severe flooding in August 2012. Potential options have been explored through those assessments but no simple or short-term solutions were identified. The options require further development in conjunction with the results from the integrated catchment study to provide solutions for the whole community. The council should develop and implement an overarching surface water management plan covering all of Bridge of Allan in order to better understand surface water flood risk and mechanisms across the whole area. The plan should consider the results of the integrated catchment study and include a high level assessment of actions.
Coordination	Action delivery lead is Stirling Council and coordinated with Scottish Water and other actions in the area.

Flood warning maintenance (Ref: 20406)

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 Stirling flood warning scheme. The scheme should be investigated for improvement and/or recalibration as part of the Upper Forth project.
Coordination	Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.

Flood defence maintenance (Ref: 20407)

Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Action detail	The existing Bridge of Allan Flood Protection Scheme continues to be monitored and remedial work carried out when required.
Coordination	Action delivery lead is Stirling 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.

There is an opportunity to work with the Allan Water Improvement Project. The project works with landowners to engage sustainable land management in the Allan Water catchment with an aim of using nature to benefit rivers.

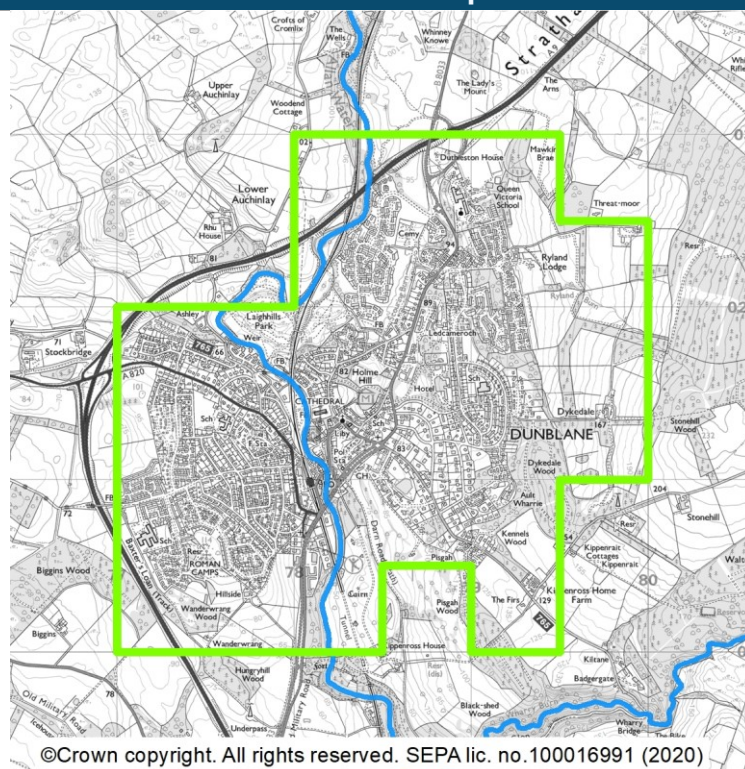
There is potential to work with SEPA's River Basin Management team to improve the physical condition of the water environment.

Dunblane (target area 223)

Summary

The town of Dunblane is located north of Stirling, on the banks of the Allan Water and within the Stirling Council area. The main sources of flooding in Dunblane are surface water and river flooding. There are approximately 820 people and 420 homes and businesses currently at risk from flooding. This is likely to increase to 960 people and 490 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. Understanding of surface water flooding is improved by a surface water management plan and a sewer flood risk assessment carried out by the local authority and Scottish Water. There is a long history of flooding in Dunblane, with a notable flood in August 2012 resulting in surface water flooding of homes and businesses, causing major infrastructure damage to roads and the railway line closed. A number of further surface water events have occurred impacting similar locations. The most recent flooding was recorded in 2018 when surface water flooding affected Claredon Place.

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
2231	Avoid flood risk	Avoid inappropriate development that increases flood risk in Dunblane
2232	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Dunblane
2233	Reduce flood risk	Reduce the risk of flooding from small watercourses in Dunblane
2234	Reduce flood risk	Reduce the risk of surface water flooding in Dunblane

What actions are proposed for this area?

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: 22301)	
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 is to continue based on the findings of the flood studies.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 22302)	
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 Stirling flood warning scheme. The scheme should be investigated for improvement and/or recalibration as part of the Upper Forth project.
Coordination	Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.

Surface water management plan (Ref: 22303)	
Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	The Surface Water Management Plan for Dunblane is complete. The local authority should continue the implementation of actions identified in the plan, including potential joint working with Scottish Water. The surface water management plan should be reviewed and updated regularly.
Coordination	Action delivery lead is Stirling Council in coordination with Scottish Water and other actions in the area.

Flood study (Ref: 22304)	
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	Updates to the existing flood modelling (river flood risk) may be required if gaps are identified by the surface water management plan. Modelling updates should quantify flood risk from small watercourses, identifying all flooding mechanisms. Flood risk should be quantified for present day and future flood risk and the interaction between surface water and river flooding should be assessed. If a significant change in the understanding of river flood risk is shown, a scoping study may be required to identify further detailed studies and works required to reduce this risk.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood scheme or works implementation (Ref: 22305)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Action detail	It is anticipated that some smaller scale local works to reduce surface water flood risk can be undertaken by Stirling Council and Scottish Water to reduce the flood risk to the largest cluster of properties in Dunblane. Delivery has been delayed by Covid restrictions.
Coordination	Action delivery lead is Stirling Council in coordination with Scottish Water and other actions in the area.

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

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.

02/09/05 (Hillfoots Villages)

This area is designated as a Potentially Vulnerable Area due to flood risk to a number of Hillfoot communities including Alva, Dollar, Menstrie and Tillicoultry. The main sources of flooding are the River Devon, small burns running off the Ochil Hills and surface water. There is a long history of flooding in this area, with recent river and surface water causing flooding of homes, roads and fields.

There are 4 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

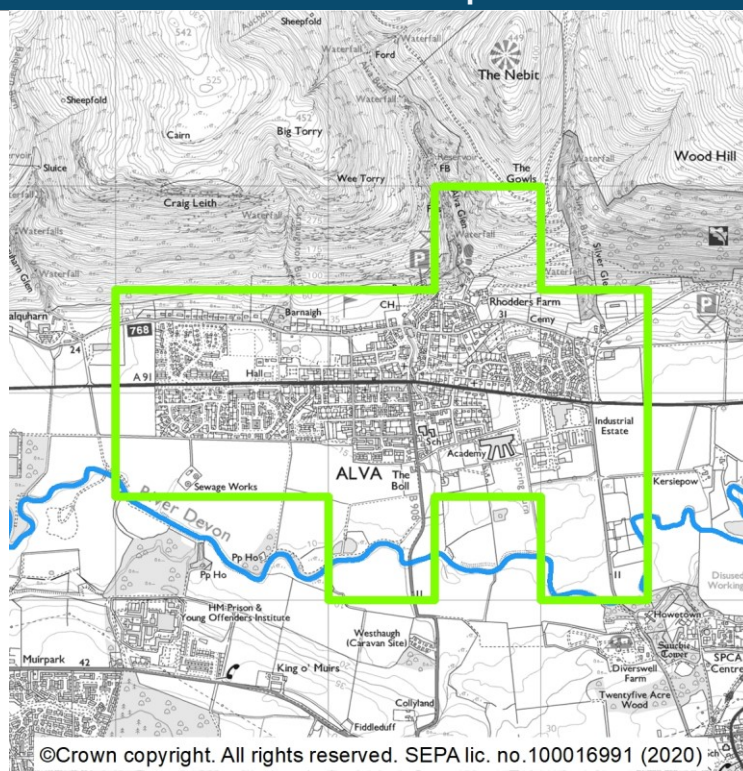
Alva	(target area 188)
Dollar	(target area 221)
Menstrie	(target area 248)
Tillicoultry	(target area 260)

Alva (target area 188)

Summary

The small town of Alva is located within the Clackmannanshire Council area. The main source of flooding in Alva is surface water, however there is also a risk from river flooding. There are approximately 1,100 people and 580 homes and businesses currently at risk from flooding. This is estimated to increase to 1,500 people and 760 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for surface water by a strategic surface water management plan published in 2018 and a sewer flood risk assessment. There are records of surface water and river flooding in the area, including a recent river flood from the River Devon, the Alva Burn and other smaller burns in Alva during 2020.

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
1881	Avoid flood risk	Avoid inappropriate development that increases flood risk in Alva.
1882	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Alva
1883	Reduce flood risk	Reduce the risk of flooding from surface water, Alva Burn, Carnaughton Burn, Spring Burn, Silver Burn and small watercourses to Alva.
1884	Reduce flood risk	Reduce the risk of flooding from the River Devon to the B908 and Shavelhaugh Loan

What actions are proposed for this area?

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: 18801)	
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	Flood risk from the River Devon to the B908 and Shavelhaugh Loan and risk to urban areas in Alva has been noted. A flood study, consisting of the initial stages of flood modelling and scoping of flood risk management options to manage flood risk, including the risk of key road closures, should be carried out by the local authority. Flood studies should consider all relevant sources of flooding and investigate a range of flood scenarios including the potential impacts of climate change.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be determined once the actions have been finalised.

Flood study (options appraisal) (Ref: 18802)	
Action	In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The strategic surface water management plan recommended that a more detailed assessment is required in Rhodders Grove and Grodwell Drive areas in Alva. This more detailed assessment should be taken forward by Clackmannanshire Council.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be required with Scottish Water.

Surface water management plan (Ref: 18803)	
Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	Clackmannanshire Council published a strategic surface water management plan in December 2018. The plan identifies a road-map for the management of surface water flood risk and the need for further detailed studies. The plan should be kept under review and updated as new information becomes available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water

Community engagement (Ref: 18804)

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	Wider community engagement will continue to be developed in partnership with the Alva Community Resilience Team, Scottish Flood Forum and the Conservation Volunteers. The engagement will also support the completion of detailed studies and a surface water management plan.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with the Scottish Flood Forum, Alva Community Resilience Team and the Conservation Volunteers.

Community resilience group (Ref: 18805)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	Clackmannanshire Council should continue to support the Alva Community Resilience Team.
Coordination	Action delivery lead is the Alva Community Resilience Team in coordination with Clackmannanshire Council.

Community flood alert (Ref: 18806)

Action	The community river level alerting system should continue to be operated and maintained to provide information on high water levels which could potentially lead to localised flooding.
Action detail	A river level alerting system has been installed on the Alva Burn. the system is operational as of November 2020 with support from Clackmannanshire Council and the Scottish Flood Forum.
Coordination	Action delivery lead is the community flood group and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 18807)

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 Devon 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?

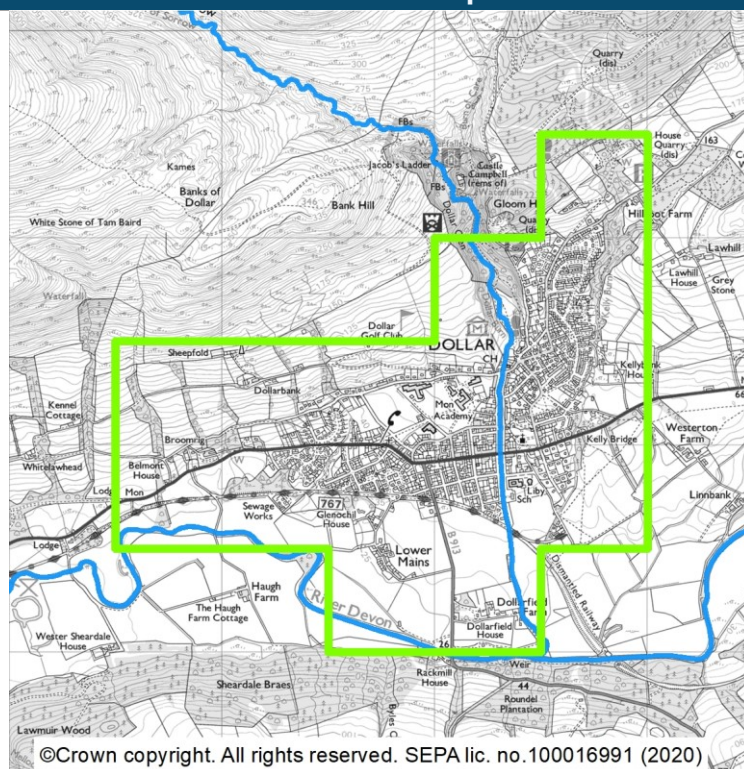
Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in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

Dollar (target area 221)

Summary

Dollar is a small town located within the Clackmannanshire Council area. The main sources of flooding in Dollar are from the River Devon, the Dollar and Kelly Burns and surface water. There are approximately 130 people and 80 homes and businesses currently at risk from flooding. This is estimated to increase to 150 people and 90 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for surface water by a strategic surface water management plan published in 2018 and a sewer flood risk assessment. There are records of river flooding from the Dollar Burn and surface water flooding in the area. A recent flood occurred in August 2020 from the Dollar Burn and Kelly Burn.

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
2211	Avoid flood risk	Avoid inappropriate development that increases flood risk in Dollar
2212	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Dollar
2213	Reduce flood risk	Reduce the risk of river and surface water flooding to Dollar

What actions are proposed for this area?

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: 22101)	
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 should be undertaken for Dollar to improve understanding of flood risk from the River Devon, Dollar Burn, Kelly Burn and Quarrel Burn. The study should consider groundwater flood risk and also surface water flood risk as identified by the strategic surface water management plan. The flood study will be required to consider strategic management options and the potential impacts of climate change.
Coordination	Action delivery lead is Clackmannanshire Council. Coordination requirements will be determined once actions have been finalised.

Surface water management plan (Ref: 22102)	
Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	Clackmannanshire Council published a strategic surface water management plan in December 2018. The plan identifies a road-map for the management of surface water flood risk and the need for further detailed studies. The plan should be kept under review and updated as new information becomes available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Community engagement (Ref: 22103)	
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 in partnership with established local flood groups in Dollar, Scottish Flood Forum and The Conservation Volunteers to support detailed studies and a surface water management plan.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be required with the Scottish Flood Forum and The Conservation Volunteers.

Community resilience group (Ref: 22104)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	Clackmannanshire Council should continue efforts to support and amalgamate the 2 community resilience groups established in Dollar. Work has commenced on the local flood plan for Dollar in partnership with Scottish Flood Forum and the council.
Coordination	Action delivery lead is the 2 community resilience groups in Dollar and coordination will be required with Clackmannanshire Council.

Community flood alert (Ref: 22105)

Action	A community river level alerting system is to be installed to provide information on the potential for localised flooding.
Action detail	The potential to install a community flood alerting system on the Dollar Burn should be investigated. This would provide a trigger for local responses to flooding including actions by existing community resilience groups and access to flood pods.
Coordination	Action delivery lead will be determined once the actions have been finalised. The action will be coordinated with Scottish Flood Forum, Clackmannanshire Council and the community.

Flood warning maintenance (Ref: 22106)

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 Devon 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?

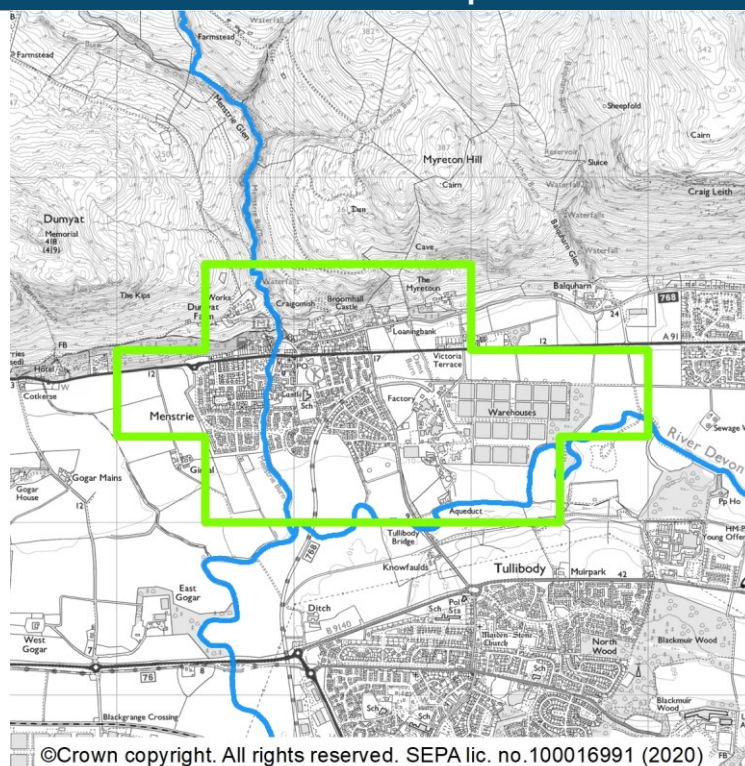
Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in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

Menstrie (target area 248)

Summary

The village of Menstrie is located within the Clackmannanshire Council area. The main sources of flooding in Menstrie are river and surface water flooding. The local authority carried out a flood study for Menstrie Burn which showed that there are 34 homes and businesses at risk of river flooding. A surface water management plan identified a further 288 homes and businesses at risk of surface water flooding.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for river flooding by a flood study for Menstrie completed in 2019. Understanding of surface water flooding is improved by a strategic surface water management plan completed in 2018 and a sewer flood risk assessment. There are records of flooding in the area from rivers and surface water. A notable flood occurred in August 2012 when a care home, 100 houses and many vehicles were damaged.

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
2481	Avoid flood risk	Avoid inappropriate development that increases flood risk in Menstrie
2482	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Menstrie
2483	Reduce flood risk	Reduce the risk of surface water flooding and flooding from the Menstrie Burn to Menstrie

What actions are proposed for this area?

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

Property flood resilience scheme (Ref: 24801)	
Action	The proposed scheme to provide resilience measures against flooding for individual buildings is to be taken forward to help prevent water entering the property and to minimise flood damage.
Action detail	Property flood resilience measures and enhanced community flood pod facilities should continue to be promoted by the local authority, SEPA and Scottish Flood Forum. Further funding mechanisms for property flood resilience purchase should be investigated and where possible installed. These include enhancement and addition to the 4 community flood pods currently provided by the council, as well as promotion of the use of individual property resilience measures. Ochilview Housing Association have a programme in place, as advised by the Scottish Flood Forum and the council, to install property flood resilience measures to protect their at risk properties in the Charrier area.
Coordination	Action delivery lead is Clackmannanshire Council. Coordination will be required with SEPA, Scottish Flood Forum and the Ochilview Housing Association.

Sewer flood risk assessment (Ref: 24802)	
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 Alloa 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 (options appraisal) (Ref: 24803)	
Action	In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The strategic surface water management plan recommended a detailed modelling study for Menstrie. This would further improve understanding of surface water flood risk in the area surrounding Blackthorn Grove and East Mains.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be required with active travel plans and wider developments in the area.

Surface water management plan (Ref: 24804)

Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	Clackmannanshire Council published a strategic surface water management plan in December 2018. The plan identifies a road-map for the management of surface water flood risk and the need for further detailed studies. The plan should be kept under review and updated as new information becomes available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Community engagement (Ref: 24805)

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 in support of the detailed studies and a surface water management plan.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be determined once the actions have been finalised.

Community resilience group (Ref: 24806)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	The Menstrie Community Resilience Group operates in this area and liaises with the local authority to help provide information and assistance when requested. These activities should continue.
Coordination	Action delivery lead is the community and coordination will be required with Clackmannanshire Council.

Community flood alert (Ref: 24807)

Action	The community river level alerting system should continue to be operated and maintained to provide information on high water levels which could potentially lead to localised flooding.
Action detail	Community river level alerting system on the Menstrie Burn should continue to be operated to provide a trigger for local responses to flooding.
Coordination	Action delivery lead will be determined once the actions have been finalised. The action will be coordinated with Scottish Flood Forum, Clackmannanshire Council and the community.

Flood warning maintenance (Ref: 24808)

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 Devon flood warning scheme.
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.

Adaptation plan (Ref: 24809)	
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	As recommended by the flood study, a longer-term adaptation strategy should be developed to assist in developing a framework to flexibly manage the Menstrie development planning process and the longer-term provisions for flood risk management.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be required with development planning.

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?

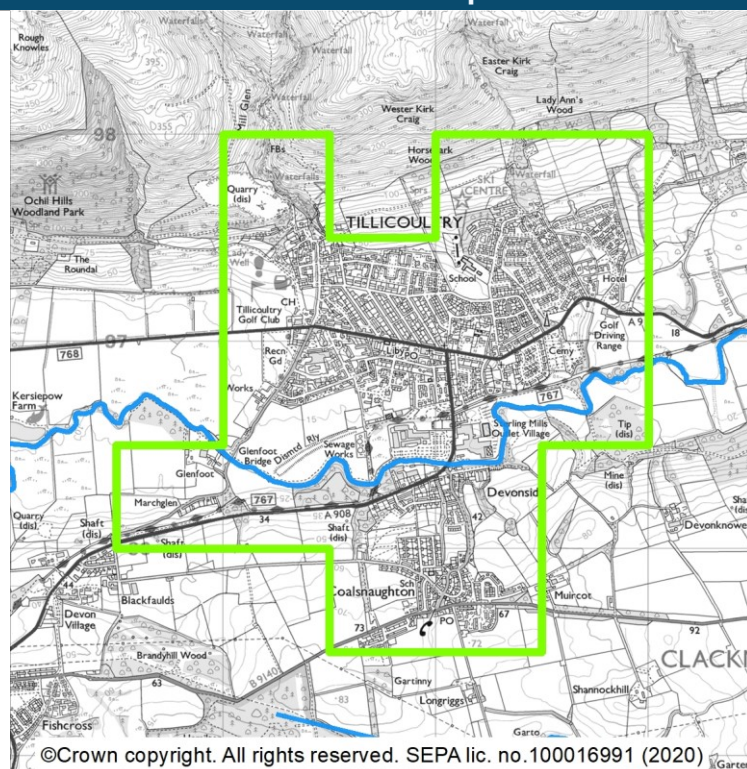
Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in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

Tillicoultry (target area 260)

Summary

Tillicoultry is a town located within the Clackmannanshire Council area. The main source of flooding in Tillicoultry is surface water, however there is also risk of river flooding from the River Devon and the Tillicoultry Burn. The local authority carried out a flood study for the River Devon and Tillicoultry Burn which showed that there are 202 homes and businesses at risk of river flooding. A surface water management plan identified a further 285 homes and businesses at risk of surface water flooding.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment is improved for river flooding by a flood study completed in 2018. Understanding of surface water flooding is improved by a strategic surface water management plan completed in 2018 and a sewer flood risk assessment. There is a long history of flooding in the area from the River Devon and the Tillicoultry Burn. A recent flood occurred in August 2020 from the Tillicoultry Burn, flooding the Lower Mill Street and Hareburn Road area. Sewer flooding also occurred in the Westbourne Avenue area in December 2020.

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
2601	Avoid flood risk	Avoid inappropriate development that increases flood risk in Tillicoultry
2602	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the existing formal defences along the River Devon.
2603	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Tillicoultry
2604	Reduce flood risk	Reduce the risk of surface water flooding and flooding from the River Devon and Tillicoultry Burn to Tillicoultry and the A908 Moss Road

What actions are proposed for this area?

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 scheme or works design (Ref: 26001)
Action	The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	The Tillicoultry Flood Study completed in 2018 presented several options, with a recommendation to protect Tillicoultry from both the River Devon and Tillicoultry Burn as a single holistic scheme. The preferred option would consist of direct defences, wall raising and removal of bridges and other crossings on the Tillicoultry Burn. The outline design and detailed design for the Tillicoultry Flood Protection Scheme should be progressed. Further analysis of natural flood management, review of emergency plans, and consideration of further development of flood warning is also recommended. Current and long term flood risk should be considered and how the flood protection scheme and the area will adapt to changes in flood risk due to climate change. Clackmannanshire Council proposes this action as the best viable option for managing fluvial flood risk in Tillicoultry. The delivery of this action is subject to funding being made available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with SEPA.

	Flood scheme or works implementation (Ref: 26002)
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. Clackmannanshire Council should progress the scheme based on the detailed design. 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 Clackmannanshire Council and coordination will be required with SEPA.

Sewer flood risk assessment (Ref: 26003)

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 Tillicoultry 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: 26004)

Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	Clackmannanshire Council published a strategic surface water management plan in December 2018. The plan identifies a road-map for the management of surface water flood risk and the need for further detailed studies. The plan should be kept under review and updated as new information becomes available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Flood study (options appraisal) (Ref: 26005)

Action	In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	In central Tillicoultry, the strategic surface water management plan recommended that a detailed surface water study should be carried out. This would further improve understanding of surface water flood risk and sewer performance, and assess potential options for flood risk management.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Community engagement (Ref: 26006)

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 in partnership with local flood group (Tideco), Scottish Flood Forum and the Conservation Volunteers to support the detailed studies and a surface water management plan.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with the Scottish Flood Forum and The Conservation Volunteers.

Community resilience group (Ref: 26007)

Action	The group of community volunteers work to prepare and put in practice their Community Resilience Plan and be supported by the local authority.
Action detail	Tideco is an active flood group in Tillicoultry. The group should continue its activities and liaison with the community in partnership with Clackmannanshire Council and where necessary other responsible authorities. Work has already begun on promoting property flood resilience via use of community flood pods installed by Clackmannanshire Council in conjunction with Tideco and the Scottish Flood Forum.
Coordination	Action delivery lead is the community and coordination will be required with Clackmannanshire Council.

Flood defence maintenance (Ref: 26008)

Action	The existing flood defences are to be maintained by the asset owner to ensure they are in good condition.
Action detail	Clackmannanshire Council should continue to maintain the flood defences on the River Devon at Elistoun Drive. These flood defences will be considered as part of the Tillicoultry flood scheme design.
Coordination	Action delivery lead is Clackmannanshire Council and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 26009)

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 Devon 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.

02/09/06 (Alloa)

This area is designated as a Potentially Vulnerable Area due to the flood risk to Alloa from surface water and the Brothie Burn. The Brothie Burn culvert plays an important role in flood risk management. There is a history of surface water flooding in this area including flooding to properties.

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

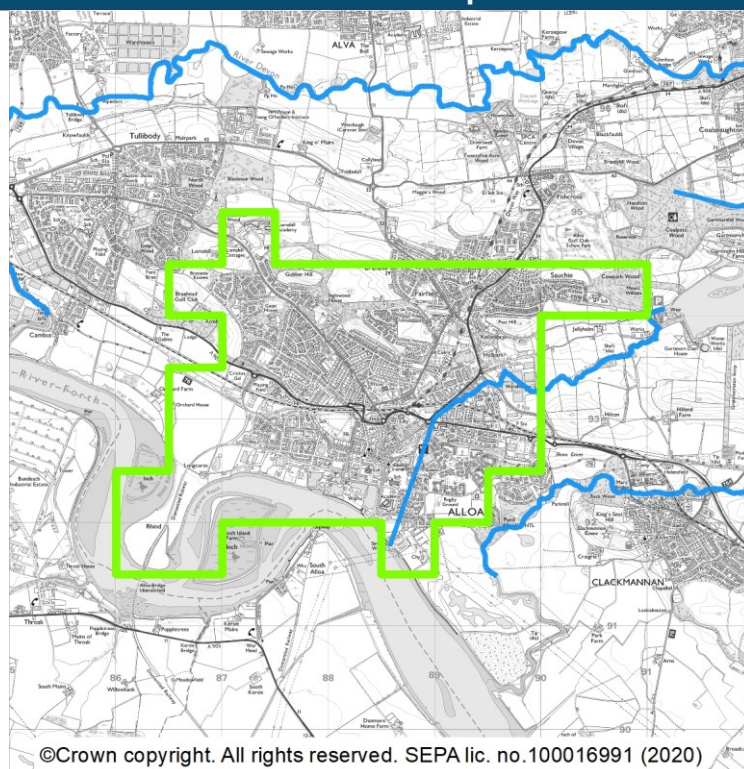
Alloa (target area 186)

Alloa (target area 186)

Summary

The town of Alloa is located on the northern bank of the River Forth within Clackmannanshire Council area. The main source of flooding in this area is surface water. Flood risk from the Brothie Burn is reduced due to the Brothie Burn culvert that plays an important role in flood risk management.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment for Brothie Burn is improved by a SEPA-led flood mapping study completed in 2020. The national level assessment is improved for surface water flooding by a strategic surface water management plan published in 2018 and a sewer flood risk assessment. There is a notable record of surface water flooding in the area including recent flooding in February and August 2020.

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
1861	Avoid flood risk	Avoid inappropriate development that increases flood risk in Alloa
1862	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of the Brothie Burn culvert
1863	Improve data and understanding	Improve data and understanding of river flooding from the Brothie Burn and surface water flooding in Alloa

What actions are proposed for this area?

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: 18601)	
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 Brothie Burn culvert plays an important role in flood risk management in Alloa. A cycle 1 study led by SEPA identified the need for a more detailed investigation of the Brothie Burn culvert. The condition of the culvert is unknown and requires further investigation to assess the structure and understand potential flood risk and management options.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with SEPA.

Flood study (options appraisal) (Ref: 18602)	
Action	In areas where flood risk is confirmed, a range of possible options to manage flood risk are to be identified, including natural flood management actions where suitable, and a preferred approach is to be chosen. This should include adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	A strategic surface water management plan assessed and analysed surface water flooding hotspots, identifying locations where further detailed studies were required. In Alloa it was recommended that a more detailed surface water study should be carried out to further improve understanding of surface water flood risk and assess potential options for the management of flood risk in 2 locations. These include Sauchie including Fairfield and Inglewood in Alloa. This work should be carried out in conjunction with the Brothie Burn culvert study. Close partnership working with Scottish Water will be required.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Sewer flood risk assessment (Ref: 18603)	
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 Alloa 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: 18604)	
Action	Areas at risk of heavy or prolonged rainfall causing flooding due to water ponding on man-made surfaces or overwhelming the drainage system have been identified. Next steps in managing such water ponding or over-whelmed drainage systems have been identified and should be implemented. The plan is to be reviewed and updated as needed.
Action detail	Clackmannanshire Council published a strategic surface water management plan in December 2018. The plan identifies a road-map for the management of surface water flood risk and the need for further detailed studies. The plan should be kept under review and updated as new information becomes available.
Coordination	Action delivery lead is Clackmannanshire Council in coordination with Scottish Water.

Flood warning maintenance (Ref: 18605)	
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.

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.

02/09/07 (South Alloa)

This area is designated as a Potentially Vulnerable Area due to flood risk to South Alloa from the River Forth. There are a few historical records of flooding in this area from river and surface water.

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

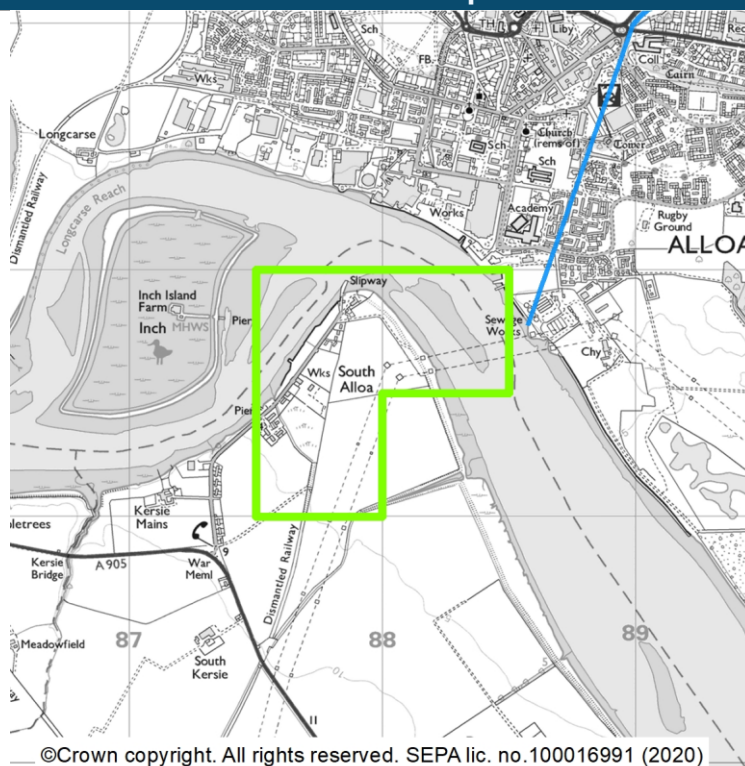
South Alloa (target area 177)

South Alloa (target area 177)

Summary

The small village of South Alloa is situated on the south bank of the River Forth within the Falkirk Council area. The main source of flooding in South Alloa is estuarine flood risk consisting of a combination of coastal and river flooding from the Firth of Forth. There are approximately 40 people and 20 homes and businesses currently at risk from flooding, which is a significant proportion of the community. This is likely to increase to 60 people and 30 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

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

What are the objectives for the area?

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

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

Objective ref	Objective type	Objective description
1771	Avoid flood risk	Avoid inappropriate development that increases flood risk in South Alloa
1772	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in South Alloa

What actions are proposed for this area?

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: 17701)	
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.

Community engagement (Ref: 17702)	
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 opportunities will be sought where possible with the community organisations of South Alloa regarding improving community resilience.
Coordination	Action delivery leads are the responsible authorities in coordination with 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?

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.

02/09/08 (Stirling)

This area is designated as a Potentially Vulnerable Area due to flood risk to Stirling and Bannockburn. There is flood risk to Stirling from river and surface water and Bannockburn from surface water. There is a history of flooding in this area, with recent flooding being caused by surface waters.

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

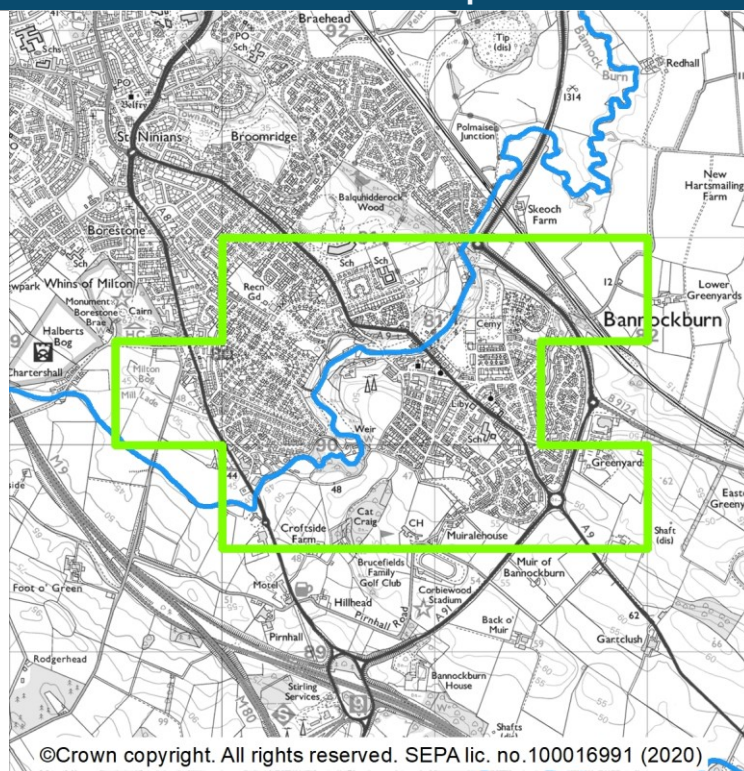
Bannockburn	(target area 195)
Stirling	(target area 258)

Bannockburn (target area 195)

Summary

Bannockburn lies immediately south of Stirling, within the Stirling Council area. The main source of flooding is surface water. There are approximately 130 people and 80 homes and businesses currently at risk of flooding. This is likely to increase to 200 people and 120 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment for surface water is improved by an integrated catchment study and a sewer flood risk assessment led by Scottish Water. There is a history of flooding in this area including records of travel disruption to A9.

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
1951	Avoid flood risk	Avoid inappropriate development that increases flood risk in Bannockburn
1952	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Bannockburn
1953	Reduce flood risk	Reduce the risk of surface water flooding in Bannockburn.

What actions are proposed for this area?

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

Sewer flood risk assessment (Ref: 19501)	
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 Stirling 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: 19502)	
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	Stirling Council should develop a surface water management plan for Bannockburn as planned. The plan should incorporate the results of the sewer flood risk assessment and integrated catchment study and include the high level assessment of actions. The impacts of climate change on future flood risk will be assessed.
Coordination	Action delivery lead is Stirling Council and coordinated with Scottish Water and other actions in the area.

Community engagement (Ref: 19503)	
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	Awareness raising should be carried out based on the findings of the surface water management plan. Stirling Council will engage Bannockburn community to gather local information and continue engagement throughout and beyond the process.
Coordination	Action delivery lead is Stirling 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?

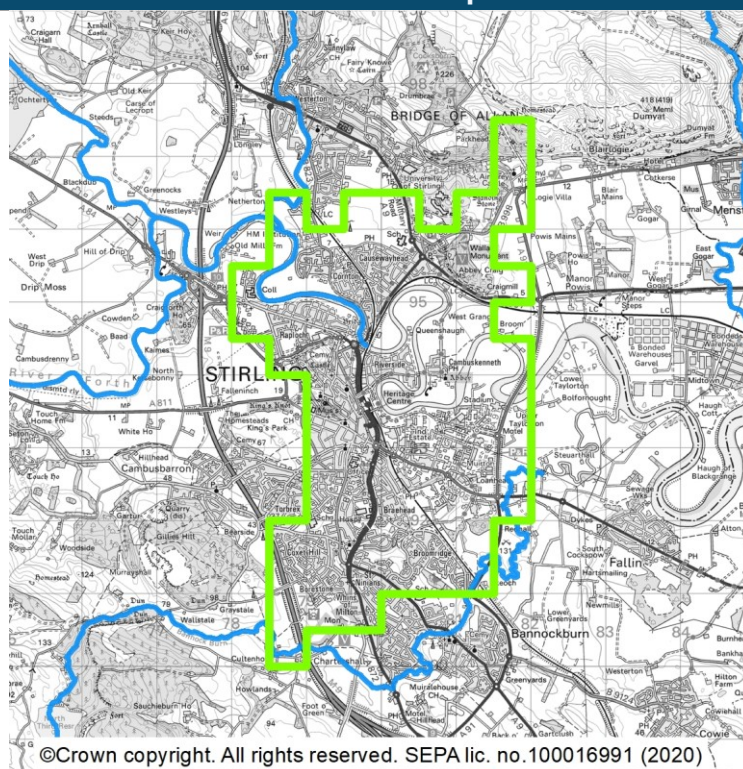
Working in partnership is at the heart of flood risk management, responsible authorities and SEPA regularly work together in all areas to improve the coordination of flood management. Working across organisations and groups contributes to sustainable ways of managing current and future flood risk in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

Stirling (target area 258)

Summary

Stirling is a city located on the River Forth in the Stirling Council area. The main sources of flooding in Stirling are surface water and river flooding, however there is also a risk of estuarine flooding. There are approximately 5,000 people and 2,500 homes and businesses currently at risk of flooding. This is estimated to increase to 8,100 people and 4,200 homes and businesses by the 2080s due to climate change.

Location map



What is the current understanding of flood risk?

This section provides a summary of information, which has helped to develop an understanding of flood risk in the area. Since 2011 SEPA has developed and updated national level assessments of flooding from rivers, surface water and coastal sources. The national level assessment for river flooding is improved by a flood study carried out by the local authority in support of the Stirling Flood Protection Scheme. Understanding of surface water flooding is improved by an integrated catchment study, a surface water management plan and a sewer flood risk assessment carried out by the local authority and Scottish Water. There is a long history of flooding in Stirling with frequent records of flooding caused by river, coastal and surface water flooding. Notable floods occurred in December 2006, June 2019 and February 2020 when flooding from the river and surface water affected homes, businesses and roads.

What are the objectives for the area?

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

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

Objective ref	Objective type	Objective description
2581	Avoid flood risk	Avoid inappropriate development that increases flood risk in Stirling
2582	Avoid flood risk	Avoid an increase in flood risk by the appropriate management and maintenance of Stirling flood protection scheme
2583	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change in Stirling
2584	Reduce flood risk	Reduce the risk of river flooding from the River Forth in Stirling
2585	Reduce flood risk	Reduce the risk of surface water flooding in Stirling.

What actions are proposed for this area?

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 scheme or works design (Ref: 25801)	
Action	The selected preferred approach for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve catchment management. This should guide adaptive planning to allow for the impacts of climate change to be monitored, understood and managed.
Action detail	Development of Stirling Flood Protection Scheme should continue into detailed design as planned, subject to favourable option assessment.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood scheme or works implementation (Ref: 25802)	
Action	The flood scheme/works is to be built following agreement of the design, costs and timescales.
Action detail	The Stirling Flood Protection Scheme was allocated funding in cycle 1. The scheme is currently under development. It is estimated that the scheme will commence construction in 2022 provided the solution is feasible, cost-effective and acceptable to stakeholders.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Sewer flood risk assessment (Ref: 25803)	
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 Stirling 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: 25804)

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	A surface water management plan for Stirling should be drawn up following the outcomes of the integrated catchments study. The plan is to address more local surface water flooding issues which have recently increased in frequency and magnitude.
Coordination	Action delivery lead is Stirling Council in coordination with Scottish Water and other actions in the area.

Community engagement (Ref: 25805)

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 to cover the development of flood protection scheme and surface water management plan. This aims to ensure that the scheme is carried out in conjunction with community engagement where issues, constraints, aspirations and opportunities are identified.
Coordination	Action delivery lead is Stirling Council and coordination will be determined once the actions have been finalised.

Flood warning maintenance (Ref: 25806)

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 Stirling flood warning scheme. The scheme should be investigated for improvement and/or recalibration as part of the Upper Forth project.
Coordination	Action delivery lead is SEPA and coordination will be determined once the actions have been finalised.

Strategic mapping improvements (Ref: 25807)

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. SEPA 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.

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.

Flood Risk Management Glossary

July 2021



Term	Definition
Accretion	Accumulation of sediment.
Actions	Activities undertaken to reduce the impact of flooding. Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities. The actions presented in the consultation are draft and will be finalised after the consultation. Selection of actions to deliver the agreed objectives has been based on a detailed assessment and comparison of economic, social and environmental criteria.
Annual Average Damages (AAD)	Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur. High likelihood events, which occur more regularly, contribute proportionally more to AADs than rarer events. Within the flood risk management plans AADs incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).
Appraisal	Appraisal is the process of defining objectives, examining options and weighing up costs, benefits, risks and uncertainties before a decision is made. The flood risk management plans appraisal method is designed to set objectives and identify the most sustainable combination of actions to tackle flooding from rivers, the sea and surface water.
Awareness raising	Public awareness, participation and community support are essential components of sustainable flood risk management. SEPA and the responsible authorities have a duty to raise public awareness of flood risk. This is undertaken both individually and collaboratively by a range of organisations. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce 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 (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' and includes sustainable drainage systems, swales (shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants), wetlands, rivers, canals (and their banks) and all 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 responders (Cat 1 / 2)	Category 1 and 2 Responders are defined as part of the Civil Contingencies Act 2004 which seeks to minimise disruption in the event of an emergency. Category 1 Responders are 'core' responders: local authorities, police, fire and rescue services, ambulance service, NHS health boards, SEPA and the Maritime and Coastguard Agency. Category 2 Responders are key co-operating responders in support of Category 1 Responders. These include gas and electricity companies, rail and air transport operators, harbour authorities, telecommunications providers, Scottish Water, the Health and Safety Executive and NHS National Services Scotland.
Channel 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 levels and stormy conditions. The term coastal flooding is used under the Flood Risk Management (Scotland) Act 2009, but in some areas it is also referred to as tidal flooding and covers areas such as estuaries and river channels that are influenced by tidal flows.
Combined sewer	Combined sewers transport sewage from homes and industry as well as carrying surface water runoff from gutters, drains and some highways. Heavy or prolonged rainfall can rapidly increase the flow in a combined sewer until the amount of water exceeds sewer capacity.
Combined sewer (overflow) (CSO)	Combined sewer overflows are purposely designed structures to ensure any excess water from sewerage systems is discharged in a controlled way and at a specific managed location.

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

Demountable defences	A temporary flood barrier is one that is only installed when the need 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.
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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 contain high river levels or protect against coastal flooding. They are commonly grass-covered, but may need additional protection against erosion by swiftly flowing water, waves or overtopping.
Emergency plans / response	Emergency response plans are applicable for all types of flooding. They set out the steps to be taken during flooding in order to maximise safety and minimise impacts where possible. Under the Civil Contingencies Act, Category 1 Responders have a duty to maintain emergency plans. Emergency plans may also be prepared by individuals, businesses, organisations or communities.
Environmental Impact	A change in the environment as a result of an action or activity. Impacts can be positive or negative and may vary in significance, scale and duration.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment (EIA) is a process which identifies the potential environmental impacts, both negative and positive, of a proposal.
Environmental sites / environmental designated areas/ environmentally designated sites	Areas formally designated for environmental importance, such as Sites of Special Scientific Interest (SSSI) Special Protection Area (SPA) or Special Areas of Conservation (SAC).
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 attenuation	A reduction in the wave energy caused by storm surge. Breakwaters (barriers built out into the sea to protect a coast or harbour from the force of waves) or habitats such as saltmarsh can slow down and reduce the inland impact of storm surges (the rising of the sea due to wind and atmospheric pressure changes associated with storms), 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 of one side with respect to the other. In Scotland the Great Glen Fault is a major geological fault line cutting diagonally across the Highlands from Fort William to Inverness.

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

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

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

Term	Definition
Flood warning scheme	A flood warning scheme is the network of monitoring on a coastal stretch or river, which provides SEPA with the ability to issue flood warnings.
Floods directive	European Directive 2007/60/EC on the Assessment and Management of Flood Risks builds on and is closely related to the Water Framework Directive (see river basin management planning). It was transposed into Scots Law by the Flood Risk Management (Scotland) Act 2009. The Directive requires Member States to assess if all watercourses and coastlines are at risk from flooding, to map the flood extent, assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.
Floodplain	Area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would flow but for the presence 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 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 catchment 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 (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 flooding	<p>The chance of flooding occurring.</p> <p>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.</p> <p>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.</p> <p>Low likelihood: A flood event is likely in the defined area on average once in every thousand years (1:1000). Or a 0.1% chance of happening in any one year.</p>
Local Flood Risk Management Plans (Local FRM Plan)	Local flood risk management plans, produced by lead local authorities, will take forward the objectives and actions set out in flood risk management plans. They will provide detail on the funding, timeline of delivery, arrangements and co-ordination of actions at the local level during each six year, flood risk management planning cycle.
Local Nature 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 Partnerships	Each LPD has established a local partnership comprised of local authorities, SEPA and Scottish Water and others as appropriate. These partnerships are distinct from the flood risk management plans local advisory groups and they retain clear responsibility for delivery of the flood risk management actions set out in the Local flood risk management plans. It is the local partnership that makes decisions and supports the delivery of these plans.
Maintenance	Sections 18 and 59 of the Flood Risk Management (Scotland) Act 2009 put duties of watercourse inspection, clearance and repair on local authorities. In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or defences.
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 Management Advisory Group (NFMAG)	The National Flood Management Advisory Group provides advice and support to SEPA and, where required, Scottish Water, local authorities and other responsible authorities on the production of flood risk management plans and Local flood risk management plans.
National Flood Risk Assessment (NFRA)	A national analysis of flood risk from all sources of flooding which also considers climate change impacts. First published in December 2011 this provides the information required to undertake a strategic approach to flood management that identifies areas at flood risk that require further appraisal. The NFRA was reviewed and updated for the second cycle of flood risk management planning in 2018.

Term	Definition
Natural flood management (NFM)	A set of flood management techniques that aim to work with natural processes (or nature) to manage flood risk.
Non-residential properties	Properties that are not used for people to live in, such as shops or other public, commercial or industrial buildings.
Objectives	Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding.
One in 200 year flood	See 'likelihood of flooding' and 'return period'.
Options appraisal study	An options appraisal study looks to identify and assess a range of options that achieve flood risk management objectives whilst delivering other economic, social and environmental benefits. This helps to inform the decision-making process and identify how options work together to identify a preferred option for managing flooding within an area.
Planning policies	Current national planning policies, Scottish Planning Policy and accompanying Planning Advice notes restrict development within the floodplain and limit exposure of new receptors to flood risk. In addition to national policies, local planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.
Potentially Vulnerable Areas (PVA)	Catchments identified as being at risk of flooding and where the impact of flooding is sufficient to justify further assessment and appraisal. There were 243 PVAs identified by SEPA in the 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 options which combined offer the most suitable way of managing flooding within an area. Based on the economic, social and 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 authority	Designated under the Flood Risk Management (Scotland) Act 2009 and associated legislation as local authorities, Scottish Water and, from 21 December 2013, the National Park Authorities and Forestry Commission Scotland. Responsible authorities, along with SEPA and Scottish Ministers, have specific duties in relation to their flood risk related functions.
Return period	A measure of the rarity of a flood event. It is the statistical average length of time separating flood events of a similar size. (See Likelihood).

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. For the purposes of flood risk management plans this commonly refers to the riparian owner, which denotes ownership of the land area beside a river or stream.
River basin management planning (RBMP)	The Water Environment and Water Services (Scotland) Act 2003 transposed the European Water Framework Directive into Scots law. The Act created the River Basin Management Planning process to achieve environmental improvements to protect and improve our water environment. It also provided the framework for regulations to control the negative impacts of all activities likely to have an impact on the water environment.
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 and Implementation Forum for Flooding (SAIFF)	The stakeholder forum on flooding set up by the Scottish Government to ensure legislative and policy aims are met and to provide a platform for sharing expertise and developing common aspirations and approaches to reducing the impact of flooding on Scotland's communities, environment, cultural heritage and economy.

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

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

Strategic Environmental Assessment (SEA)	A process for the early identification and assessment of the likely significant environmental effects, positive and negative, of activities. Often considered before actions are approved or adopted.
Strategic Flood Risk Assessment (SFRA)	A Strategic Flood Risk Assessment is designed for the purposes of specifically informing the Development Plan Process. A SFRA involves the collection, analysis and presentation of all existing and readily available flood risk information (from any source) for the area of interest. It constitutes a strategic overview of flood risk.
Strategic mapping improvements	Strategic mapping improvement actions have been identified in locations where SEPA is planning to undertake additional modelling or analysis of catchments and coastlines, working collaboratively with local authorities where appropriate, to improve the national understanding of flood risk.
Surcharge	Watercourses and culverts can carry a limited amount of water. When they can no longer cope, they overflow, or 'surcharge'.
Surface water flooding	Flooding that occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.
Surface Water Management Plan (SWMP)	A plan that takes an integrated approach to drainage accounting for all aspects of urban drainage systems and produces long term and sustainable actions. The aim is to ensure that during a flood the flows created can be managed in a way that will cause minimum harm to people, buildings, the environment and business.
Surface water plan / study	The management of flooding from surface water sewers, drains, small watercourses and ditches that occurs, primarily in urban areas, during heavy rainfall. 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.
Term	Definition
Sustainable flood risk management	The sustainable flood risk management approach aims to meet human needs, whilst preserving the environment so that these needs can be met not only in the present, but also for future generations. The delivery of sustainable development is generally recognised to reconcile three pillars of sustainability – environmental, social and economic.
Sustainable drainage systems (SuDS)	A set of techniques designed to slow the flow of water. They can contribute to reducing flood risk by absorbing some of the initial rainfall and then releasing it gradually, thereby reducing the flood peak and helping to mitigate downstream problems. SuDS encourage us to take account of quality, quantity and amenity / biodiversity.
Target area	Target areas are based on communities at risk of flooding. These are situated within Potentially Vulnerable Areas and should benefit from actions to reduce flood risk. To benefit the community, actions may apply to outside the target area. National flood risk management efforts and funding should be targeted to benefit these target areas.

UK Climate Change Projections (UKCP18)	The leading source of climate change information for the UK. It can help users to assess their climate risks and plan how to adapt to a changing climate. The high emissions scenario refers to the RCP8.5 emission scenario. See the UKCP18 climate change projections report for details.
Utility assets	Within the flood risk management plans this refers to electricity sub stations, mineral and fuel extraction sites, telephone assets, television and radio assets.
Voe	A dialect term, common in place names and used to refer to a small bay or creek in Orkney or Shetland.
Vulnerability	A measure of how likely someone or something is to suffer long-term damage as a result of flooding. It is a combination of the likelihood of suffering harm or damage during a flood (susceptibility) and the ability to recover following a flood (resilience).
Wave energy dissipation	Process by which a wave loses its energy.
Wave overtopping	Wave overtopping occurs when water passes over a flood wall or other structure as a result of wave action. Wave overtopping may lead to flooding particularly in exposed coastal locations.