



Flood Risk Management (Scotland) Act 2009:

# INTERIM REPORT

## Local Flood Risk Management Plan

### Forth Local Plan District



**Published by: Stirling Council**

Developed in Partnership:



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## Foreword

This INTERIM REPORT to the Local Flood Risk Management Plan shows the progress made in delivering the actions to avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities across the local plan district.

*“The impacts of flooding experienced by individuals, communities and businesses can be devastating and long lasting. It is vital that we continue to reduce the risk of any such future events and improve Scotland’s ability to manage and recover from any events which do occur.”*

[\(Forth Local Flood Risk Management Plan, June 2016\)](#)

The publication of the INTERIM REPORT shows that the coordinated and collaborative efforts of public bodies can be brought together to deliver sustainable outcomes.

The INTERIM REPORT is published by Stirling Council on behalf of a partnership comprising five local authorities: Clackmannanshire Council, Perth and Kinross Council, Fife Council, and Fife Council as well as Scottish Water; SEPA; Loch Lomond and the Trossachs National Park Authority and Forestry Commission Scotland.

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. Through self-help and property level protection, awareness raising and signing up to [Floodline](#), individuals, businesses and communities can and have made key contributions to the delivery of the actions in the Plan, which are detailed in this INTERIM REPORT.

Since the publication of the Plan in June 2016, public sector finances in Scotland have continued to be under considerable pressure. This places an even greater responsibility on SEPA, local authorities and Scottish Water and other responsible authorities to deliver their flood risk management responsibilities and, in particular the actions in the Plan, to manage flooding in a sustainable way.

## Contributions

Clackmannanshire Council  
Perth and Kinross Council  
Fife Council  
Falkirk Council  
Angus Council  
SEPA  
Loch Lomond and the Trossachs National Park  
Scottish Water  
Scottish Flood Forum

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## List of Acronyms and Abbreviations

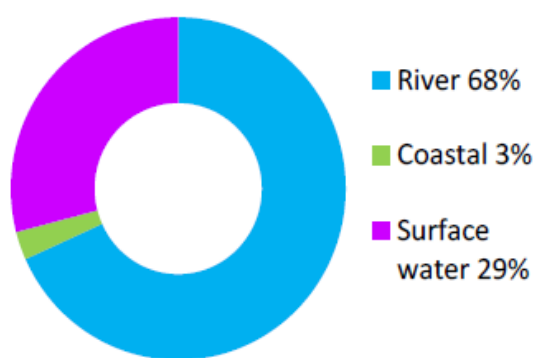
AOB - Area of Benefit  
ICS – Integrated Catchment Study  
FCS – Forestry Commission Scotland  
LLTNPA – Loch Lomond and the Trossachs National Park Authority  
LPD - Local Plan District  
LFRMP - Local Flood Risk Management Plan  
PVA - Potentially Vulnerable Area  
PVAc - Candidate Potentially Vulnerable Area  
Q & S – Quality and Standards (Scottish Water)  
RAs - Responsible Authorities, (Stirling Council, Clackmannanshire Council, Perth and Kinross Council, Fife Council, Falkirk Council, Loch Lomond and the Trossachs National Park, Forestry Commission Scotland, Scottish Water).  
SAC – Special Area of Conservation  
SEPA - Scottish Environment Protection Agency  
SFF – Scottish Flood Forum  
SFRS – Scottish Fire and Rescue Service  
SPA – Special Area of Conservation  
SNH - Scottish Natural Heritage  
SW – Scottish Water  
TCV – The Conservation Volunteers  
TSSR – Trossachs Search and Rescue Service  
RSPB – Royal Society for the Protection of Birds



# Chapter 1

## 1,1 Summary of Local Plan District and flood risk

[The Local Flood Risk Management Plan](#) has an area of 1609km<sup>2</sup>; population of approximately 130,000; and encompasses all or part of five local authorities. There are approximately 3,100 residential and 660 non-residential properties at risk of flooding included in 12 Potentially Vulnerable Areas with total Annual Average Damages from all sources of flooding estimated at approximately £7 million.



**Figure 1: Percentage of Average Annual Damages from all sources of flooding.** Reproduced from the Forth Flood Risk Management Strategy, SEPA (December 2015)

For more information see the [Forth Flood Risk Management Strategy](#).

## 1.2 Background

The INTERIM REPORT is a legal requirement of the Flood Risk Management (Scotland) Act 2009(Section 37). The INTERIM REPORT is required to be published between July 2018 and June 2019. The INTERIM REPORT includes the conclusions of a review of the [Forth Local Flood Risk Management Plan](#) (the 'Plan'), published in June 2016 and includes information on the progress that has been made towards implementing the actions identified in the Plan.

Further details on flood risk management responsibilities in Scotland and the legal requirement for the publication of this INTERIM REPORT can be found in Appendix 1.

A copy of the [Forth Local Flood Risk Management Plan](#) can be found by following the link.

## 1.3 What you can do to help

### Self-help/awareness raising actions

- Local authorities and SEPA raise awareness of flood risk in targeted ways, individuals and community groups have local knowledge and can help raise local awareness of flooding. SEPA and Local Authorities hold information on flood risk

### Community flood action group

- There is a national drive for communities to develop greater resilience, to be able to react to different challenges including weather related problems, power failures and other problems impacting communities. Some communities have developed community flood action groups where others have more generic resilience plans which incorporate flood management activities. The [Scottish Flood Forum](#) have vast experience in helping develop community flood action plans

### Property level protection

- Individuals have prime responsibility to protect their property against flooding. Where property is considered to be at flood risk local authorities would urge them to consider investing in property level protection measures. There are a range of things that can be done to protect properties against flooding which depend on the type of flooding and the depths predicted to impact a property. For more information and advice contact the [Scottish Flood Forum](#)

### Sign up to [Floodline](#)

- Floodline is operated by SEPA and provides live flooding information and advice on how to prepare for flooding. Signing up to Floodline would allow individuals to select tailored information to receive. Local Authorities and SEPA would encourage members of the public to visit the website and consider registering to receive tailored alerts.

## Chapter 2

### 2.1 Review of the plan

This section sets out the conclusions of the review of the plan and a summary of progress of actions detailed in [Forth Local Flood Risk Management Plan](#). It draws upon the assessment of progress of actions presented in the subsequent sections.

### 2.2 Key progress in reducing the impacts of flooding since publication

Within the Forth LPD 151 Actions were identified to be taken forward during the six year plan cycle. Of these actions 85 are continuous on-going activities such as flood forecasting, maintenance and planning policies. Eight have been completed and five have not yet started.

Key actions being taken forward at present are;

- **Four flood alleviation schemes** are being developed in Stirling, Bridge of Allan, Callander and Aberfoyle. Two of these are planned to be constructed by 2022 as originally planned, two of the construction phases will be delayed for proposed delivery in cycle 2.
- **Four flood alleviation studies** have been completed for Aberfoyle, Gargunnock, Menstrie and Tillicoultry with further actions to be determined from the outcome of these studies. The Fifth and final flood study for Blackford will be completed in 2019.
- **A strategic surface water management plan** was completed by Clackmannanshire council in 2018,
- **Stirling Integrated catchment study** is progressing with Scottish water taking the project lead role and its conclusions will feed into a surface water management plan to be taken forward by Stirling council between 2019 –and 2022.
- **Awareness raising projects** engaging with schools and local communities have carried out by Clackmannanshire council. The council are taking forward a community flood warning project with partner organisations TCV, SFF and SEPA and local volunteers and partner organisations
- **A community flood warning project** has been launched 2018 in partnership with TCV and Stirling Council. This project aims to engage with the community and local primary school

to raise awareness of local flooding, to develop a local community warning for the lochside at Loch Ard

- **A partnership project** between Clackmannanshire and Stirling councils, with the Scottish Fire and Rescue service, SEPA, and the Scottish Flood Forum is ongoing. The group aims to develop a better model of ongoing partnership working as well as developing joint flood response plans and preparations.
- **Data sharing and understanding** - Significant progress has been made developing relationships, sharing of knowledge, information and understanding between partner responsible authorities beyond any previous working relationships allowing joint working and joint solutions to be sought where there are common problems.
- **Community engagement and awareness raising** activities have been carried out across the Perth and Kinross council area, specifically in PVA's where significant actions are underway or have been undertaken. For example, the council will be in communication with the residents of Blackford throughout the area's flood study.
- **Flood Forecasting** - SEPA has continued to operate the Scottish Flood Forecasting Service Partnership with the Met Office. Daily, national flood guidance statements are issued to Category 1 and 2 agencies (such as emergency responders, local authorities and other organisations with flooding management duties). Each daily statement gives an assessment of the risk of flooding for the next five days to help enable these organisations to put preparations in place to reduce the impact of flooding. SEPA's Flood Alert service is freely available to everyone and helps enable communities to be aware and prepared to reduce the impacts of flooding. SEPA has also continued to provide flood warning service to a number of locations within the Tay Local Plan District. A number of flood mapping and modelling improvements are underway in the Forth Local Plan District by SEPA and other organisations. This will improve the understanding of flood risk across this area.
- **Flood guidance statements.** SEPA has continued to operate the Scottish Flood Forecasting Service Partnership with the Met Office. Daily, national flood guidance statements are issued to Category 1 and 2 agencies (such as emergency responders, local authorities and other organisations with flooding management duties). Each daily statement gives an assessment of the risk of flooding for the next five days to help enable these organisations to put preparations in place to reduce the impact of flooding. SEPA's Flood Alert service is freely available to everyone and helps enable communities to be aware and prepared to

reduce the impacts of flooding. SEPA has also continued to provide flood warning service to a number of locations within the Tay Local Plan District.

- **Flood mapping and modelling.** A number of flood mapping and modelling improvements are underway in the Forth Local Plan District by SEPA and other organisations. This will improve the understanding of flood risk across this area.
- A **new coastal flood warning for the Alloa harbor** area has been delivered by SEPA. The new flood warning service has been in operation since 2017.

## 2.3 How current is the Plan?

The Plan was published in June 2016 supplementing the Flood Risk Management Strategy published by SEPA in December 2015. The Plan details how the actions identified in the Strategy were to be implemented over the period 2016 to 2022. The Strategy and Plan are based on the National Flood Risk Assessment and the designated Potentially Vulnerable Areas at that time.

Since the identification of the actions in the Plan, there have, and continue to be advancements in our knowledge and methodologies. These include the publication by SEPA of an updated National Flood Risk Assessment and Potentially Vulnerable Areas in December 2018. These advancements may inform the delivery of the actions in this Plan and will be used in the development of future Strategies and Plans. Changes to planned delivery of actions is outlined in the assessment of the progress of actions section.

## 2.4 Significant challenges

Based on a review of the assessment of the progress of actions detailed in this INTERIM REPORT, the following key themes and issues have been identified that have, or may have an impact on the delivery of actions to manage flood risk. Arrangements planned to deliver the remaining actions are described below. Where these issues have had an impact on the delivery of specific actions or actions across an LPD, this is detailed in the 'Assessment of the progress of actions'.

The overall delivery of actions in the Plan has been impacted by funding and resource issues.

## 2.4 (i) Significant weather events

The Forth LPD was adversely affected by significant weather events in December 2015 and January 2016, which had knock on impacts on the delivery of actions in the Plan from June 2016 onwards. For example, council resources across the district were deployed dealing with the emergency events at that time as well as the follow up activities such as dealing with the administration of the Scottish Government flood grant and necessary works, which were being delivered into financial year 2017/18 (and in some cases into 2018/19. This has caused consequential delays in the planned delivery of actions as staff resource that would have been delivering planned actions has been delivering emergent actions. Scheme design proposals for Aberfoyle have been altered partially due to the impacts of these flood events.

Arrangements planned to deliver the remaining actions affected by significant weather events are described below and detailed in the 'Assessment of the progress of actions' section of this INTERIM REPORT.

## 2.4 (ii) Funding

The 'actions in the Plan to meet agreed goals and objectives in the first six-year cycle considered what would be achievable assuming a similar level of funding for flood risk management activities from The Scottish Government. However, given the timing of spending reviews and annualised financial settlements for local government, the actual ability to deliver all the actions set in the Strategies in December 2015 and detailed in this Plan will be dependent on the availability of the necessary funding in each year of the six year Plan', (Forth Local Flood Risk Management Plan, June 2016).

The level of funding from Scottish Government for flood risk activities for the first years of the six year Plan has been at the levels anticipated. As per the principals of financial settlements for local government, the funding is not 'ring fenced' and local authorities may have allocated these funds to the delivery of other priorities.

## 2.4 (iii) Allocation of Resources

The impact on the level of funding from Scottish Government in general settlements for local government may also have had an effect on the availability and allocation of resources within local authorities.

The budgets directly available for delivering flood risk actions has been a limiting factor in some areas. This has caused consequential delays in the planned delivery of actions.

The availability and retention of skilled staff to deliver flood risk actions has been a limiting factor in some areas. This has caused consequential delays in the planned delivery of actions.

Arrangements planned to deliver the remaining actions affected by allocation of resource issues are described below and detailed in the 'Assessment of the progress of actions' section of this INTERIM REPORT.

#### **2.4 (iv) Procurement and Use of Contractors and Consultants**

The availability and procurement of consultants and professional advisors, and availability of necessary data to allow consultants to progress has been a limiting factor in some areas. This has caused consequential delays in the planned delivery of actions and may led to increased costs.

Arrangements planned to deliver the remaining actions affected by the use of consultants issues are described below and detailed in the 'Assessment of the progress of actions' section of this INTERIM REPORT.

#### **2.4 (v) Cost increases**

Cost increases as actions are detailed and developed have also been a limiting factor in some areas. This has caused consequential delays in the planned delivery of actions and has led to increased costs.

Arrangements planned to deliver the remaining actions affected by cost increase issues are described below and detailed in the 'Assessment of the progress of actions' section of this INTERIM REPORT.

#### **2.4 (vi) Other actions**

All partner local authorities have watercourse inspection and clearance and repair schedules which will be explained in further detail.

## 2.5 Prioritisation of actions for next plan cycle

Many actions contained in the current plan are to undertake studies and develop plans that will assess the need for further actions to be implemented in future plans as opposed to actions on the ground during the current plan cycle. The outcome of the actions may suggest flood alleviation schemes or other actions are required to be carried out in a future plan. These outcomes can be submitted for consideration of funding in future plan cycles.

## 2.6 Arrangements planned to deliver the remaining actions

Actions in the Plan will continue to be delivered over the remainder of the 2016 to 2022 period. This will be as per the published Plan, subject to revisions in deliver dates or where identified as not able to be completed as detailed in the 'Assessment of the progress of actions' section of this INTERIM REPORT.

Most actions in the Plan will be delivered by June 2022. There are currently several actions unable to be delivered within cycle one; the delivery of the construction phase of Stirling and Aberfoyle flood alleviation schemes will not be delivered until cycle 2; however the design work for both schemes will continue through the current Plan cycle; the surface Water management plan for Gargunnock will not be progressed as new information suggests this no longer necessary as the flood risk is lower than originally anticipated, the Integrated catchment study for Alloa will not progress beyond a scoping stage due to new information derived by Scottish Water. The councils may however still undertake local investigation and improvement works where specific actions are no longer required.

Where specific measures are required to address a delay and ensure an action is completed then this is described against the relevant action. In addition where there is a risk that remaining actions will not be delivered by the end of the Plan, planned contingencies have been considered, which are described against the relevant action.



## 2.7 Next steps

A Final Report on the plan will be published in between July 2021 and June 2022. This will include an updated assessment of the progress made towards implementing the current actions, a summary of the current measures which were not implemented, with reasons for their non-implementation; and a description of any other measures implemented since the plan was finalised which the lead authority considers have contributed to the achievement of the flood risk objectives.

In the meantime, to find out more about how flood risk is being managed please refer to your local authority website:

[Fife Council - Flooding](#)

[Perth and Kinross Council - Flooding](#)

[Stirling Council - Flooding](#)

[Clackmannanshire council](#)

*Falkirk Council*

## 2.8 Conclusions

There are a number of key positive outcomes of the Plan in the period since commencement in June 2016. Partnership working among partner local authorities and organisations has been fundamental to making a success of the Plan; partner local authorities and organisations have all benefitted from knowledge sharing and a greater understanding of how individual organisations operate. Establishing good working relationships between all partners has been important where there were previously little or no links, and where links were already established they have been improved and strengthened. This in turn has led to closer working relationships with other organisations and groups that are not named responsible authorities. This has provided a platform and greater opportunity for truly sustainable solutions to be considered that present best value for money and provide multiple societal benefits wherever possible.

Awareness raising and community involvement has been a significant positive outcome in the Forth local flood risk management planning area with some key communities at high risk being engaged. These interactions have given communities a sense of empowerment and in some areas improved public confidence in the work being carried out by all responsible authorities. Many of the actions in the plan are long-term such as studies, surface water management plans and development of flood schemes that will not result in action on the ground for a number of years therefore awareness raising and public engagement is essential to keep communities informed of progress and self-help opportunities

Not all actions have been carried out to the original plan timeframe for a number of reasons whether technical challenges, lack of resource or changes to the original proposals. Increasing budget pressures for the public sector in its entirety means greater competing needs for funding and resources. The financial pressures created by high cost schemes and works may require further prioritisation through development of more detailed information on proposed actions and review of delivery timescales may be required in future cycles to attain better initial information on projects and projected costs and timescales. Having more detailed information at the prioritisation stage would give partners confidence to plan for costs in given timescales to prevent over-commitment of finance and resource. In spreading these larger capital expenditure costs over longer timeframes there is greater need for intermediate actions in the form of maintenance, education and partnership working with other organisations and community groups to provide innovative low cost interim measures. These relationships have begun to be formed and will continue to be developed and strengthened over time.

## Chapter 3 Progress at LPD and PVA level

### 3.1 Assessment of progress

This section sets out an assessment of the progress towards implementing the actions set out in the LFRMP.

There are actions that apply across the whole of the FORTH LPD and actions that are specific to each of the 12 Potentially Vulnerable Areas (as defined under Section 13 of the Act) in the FORTH LPD, which are shown below in Figure 1.

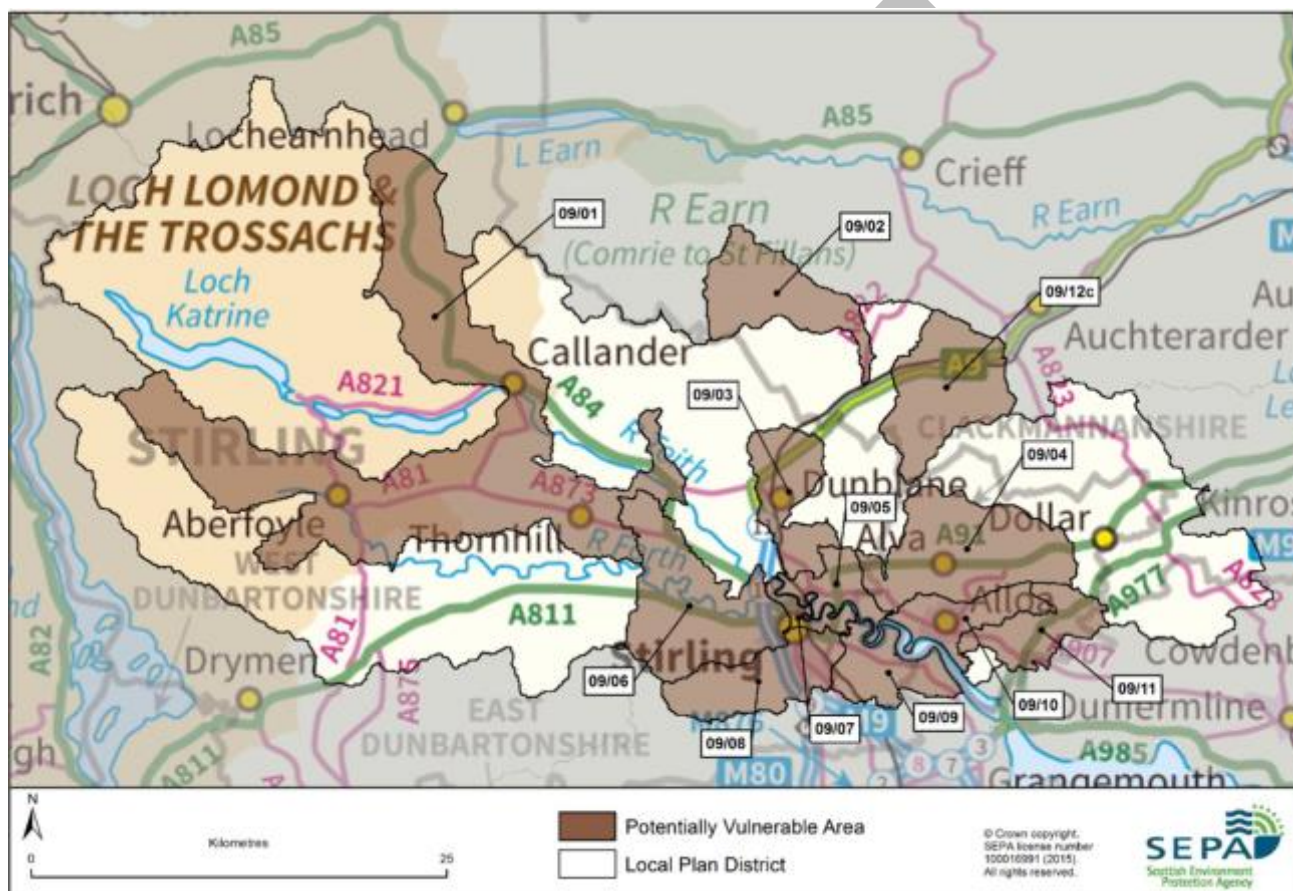


Figure 2: The Forth Local Plan District with Potentially Vulnerable Areas identified  
Reproduced from Forth Local Plan District Flood Risk Management Strategy, SEPA (December 2015)

The actions that apply to individual PVA across the FORTH LPD are shown overleaf in Figure 2. The summary of the assessment of progress is shown using the traffic light system, where each item is marked as Red, Amber or Green (RAG) and where:

- **GREEN** – Action has been delivered is on programme and within budget;
- **AMBER** – Action is behind programme and/or over budget, but the key dates are still anticipated to be met.
- **RED** – Action is behind program and/or over budget, with key dates unlikely to be met and/or the outputs unlikely to achieve what was anticipated by the LFRMP..

**Table 1:** Summary of progress of actions to manage flood risk in the Potentially Vulnerable Areas of the Forth

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain Flood Warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
Trossachs (09/01)	R		G	A	G	A	G	R	G	G		G	G	G	A		G	G
Braco (09/02)										G			G	G	G		G	G
Dunblane and Bridge of Allan (09/03)	A						G	A	G	G			G	G	A		G	G
Hillfoots Villages (09/04)				G		G	G		G	G		G	G	G	G		G	G
Cornton & Causewayhead (07/05)	R					A	G		G	G			A	A	A		G	G
Gargunnoch (07/06)				G			G		G	G			A	A	A		G	G
Raploch and Riverside (09/07)	R					A	G			G			A	A	A		G	G
Broomridge & St Ninians (09/08)						A	G			G			A	A	A		G	G
Stirling Eastern Villages (09/09)							G			G			A	A	A		G	G
Cambus, Alloa, Sauchie (09/10)			G			G	G			G			G	G	G		G	G
Clackmannan & Forestmill (09/11)							G			G			G	G	G		G	G
Blackford (09/12)				G						G			G	G	G		G	G

## 3.2 Progress with LPD-wide Actions

This section sets out an assessment of the progress towards implementing actions that apply across the whole of the FORTH LPD over all years of the six-year Plan, which is presented in Figure 3 overleaf.

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Table 2: Summary of LPD wide actions

Action	Status	Description	Delivery Lead	Progress in Delivery, including key deliverables and dates	Planned actions to complete / address delay
<b>Flood forecasting</b> (90320009)	<b>G</b>	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.	SEPA	SEPA has continued to operate the Scottish Flood Forecasting Service (SFFS) Partnership with the Met Office with daily, national Flood Guidance Statements issued to Category 1 and 2 agencies (such as emergency responders, local authorities and other organisations with flooding management duties) and regional Flood Alerts issued to the public. Each daily statement gives an assessment of the risk of flooding for the next five days to enable these organisations to put preparations in place to reduce the impact of flooding. SEPA's Flood Alert service is freely available to everyone and enables communities to be aware and prepared to reduce the impacts of flooding.	SEPA will continue and improve the Scottish Flood Forecasting Service (SFFS) with the Met Office, with daily Flood Guidance Statements and regional Flood Alerts issued as required to enable communities and responders to reduce the impacts of flooding. SEPA is currently exploring options to develop a public version of the daily Flood Guidance Statement to provide better and earlier information to the public.
<b>Self help</b> (90320011)	<b>A</b>	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 level protection, signing up to <a href="#">Floodline</a> and the Resilient Communities Initiative, and ensuring that properties and businesses are insured against flood damage.	Individuals	<b>The Scottish Flood Forum</b> , as well as working on specific community projects, undertake more strategic community Engagement including, setting up and attending property level protection exhibitions, aiding selection of these products, providing home assessments and appropriate and relevant information to enable members of the public to make informed decisions. The Scottish Flood Forum also have ongoing community property level protection training and Flood Warden and resilience group promotion.  Local authorities are happily supporting communities, individuals and the Scottish Flood Forum to become resilient from promotion of	This is an on-going community/individual led activity which local authorities, SEPA and the Scottish Flood Forum will continue to support.



Awareness raising (90320013)				<a href="#">Floodline</a> , to providing advice on risk and advocating property level protection.  Community specific interactions is detailed within individual PVA sections where appropriate.	
	<b>G</b>	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p><b>SEPA</b></p> <p>From 2016 SEPA will undertake flood risk education and awareness raising activities. Across Scotland, SEPA will create and share communication and education resources with other Responsible Authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (<a href="#">Floodline</a>). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Each Responsible Authority will undertake awareness raising activities suited to their local requirement and geographical area but these actions will be co-ordinated through the Local Plan District partnership and are described in more detail in Chapter 4 within each Potentially Vulnerable Area.</p>	SEPA and Responsible Authorities	<p>SEPA has delivered a range of awareness raising activities through campaigning, education activities and partnership delivery. We have run national and local digital and direct engagement campaigns to raise awareness of flood risk and SEPA's flood warning service, Floodline. We publish and publicise an electronic newsletter (Flooding Gateway) four times a year which is distributed to a wide audience. We are working with Education Scotland and Scottish Government Resilience team to embed flooding awareness within the Curriculum for Excellence, and resilience partners in Safer Communities programmes. We have also developed an online tool that helps everyone share information on current flooding issues (Report-a-Flood). We have worked in partnership with local authorities, emergency services and community organisations (e.g. Neighbourhood Watch Scotland, Citizens Advice Scotland and others) to share our resources and help to promote preparedness and understanding of how we manage flood risk in Scotland. We have actively supported the Scottish Flood Forum and worked closely with UK agencies to develop joint flooding information.</p> <p><b>Clackmannanshire Council</b></p> <p>Through Education Scotland, the Council established local links with Menstrie Primary School and The</p>	<p>SEPA will continue to raise awareness of flood risk through campaigning, developing education and engagement tools, creating new partnerships and improving the flood warning and forecasting service. Many of our awareness raising activities currently underway will continue. Our focus will be on promoting flood warning and forecasting service, innovation, education and engagement with partners, customers and the public</p> <p><b>Clackmannanshire Council</b> through its ongoing partnership with SFRS, SFF, TCV and currently established local flood groups, will continue its efforts to raise awareness of flood risk and community resilience.</p> <p><b>Perth and Kinross Council</b> will continue with awareness raising activities when developing proposals for the remaining actions in its local flood risk management plans.</p> <p><b>Stirling Council</b> through its ongoing partnership with Clackmannanshire Council, SFRS, SFF, TCV, TSSR and established local flood groups, resilience groups and community councils, will continue its efforts to raise awareness of flood risk and community resilience.</p> <p><b>Fife Council</b> carry out awareness raising through</p>

			<p>Conservation Volunteers (TCV) in 2016/17 to set up a project to glean local flood volunteers and link with STEM subjects within the primary school. This led to community awareness raising event in Menstrie PS, March 2017. 300 attended. Project includes ongoing contact between TCV and Menstrie PS with input to related STEM subjects and management of volunteer actions to inspect, record data and where safe to do so, clear sensitive watercourses of debris. Appropriate training for such work has been given to volunteers.</p> <p><b>Perth and Kinross Council</b></p> <p>Perth and Kinross Council has developed its website to provide more advice and information on flood risk management.</p> <p>Awareness raising activities will take place around specific project proposals (mainly the Blackford Flood Study). This activity will be coordinated with SEPA and the Scottish Flood Forum.</p> <p>Any awareness raising activity has been coordinated with existing community resilience groups, where they exist.</p> <p><b>Stirling Council</b></p> <p>Generic awareness raising is carried out through the council website and social media. The council use SEPA flood Alerts as a targeted timing to deliver flood awareness information.</p> <p>The council are developing an annual programme of attending local highland games and other public gatherings to deliver awareness raising objectives.</p>	<p>community meetings, flood study public meetings, CC and Local Members input as well as through Emergency resilience Team within FC.</p> <p><b>Falkirk Council</b></p> <p><b>Forestry Commission Scotland</b> will continue to improve FCS regional knowledge on flood risk and the potentially vulnerable areas; ii) to identify opportunities for forestry projects across the country iii) continue to engage with local communities through the revision of Land Management Plans</p>
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			<p>The council will work with Scottish Fire and Rescue Service to deliver joint flooding messages at Fire station open days annually to reach a wider audience.</p> <p><b>Fife Council</b></p> <p>Fife council are awareness raising through community meetings, flood study public meetings, CC and Local Members input as well as through Emergency resilience Team within FC.</p> <p><b>Falkirk Council</b></p> <p><b>Forestry Commission Scotland</b> continues to engage with the responsible authorities to make sure that the contribution of woodlands and forestry is recognised when natural flood management measures are promoted. Interactions with the public are sought at public National events (for example the Royal Highland Show) and regional/local events (for example the Turiff Show) to highlight the role that trees and woodland have in contributing to managing flood risk. This includes working with facilitators (from the charitable sectors and businesses) to help partnership initiatives that aim to improve public resilience to flood risk and to make sure that the communities have access to information and help/support. We continue to work on partnership initiatives to spatially identify where woodland can be planted and managed - these include the local communities. Forest Enterprise Scotland (the agency of Forestry Commission</p>	
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				Scotland) engages with communities, NGOs and statutory stakeholders on the revision of Land Management Plans. Flooding is part of these catchment-focused discussions where our planners raise awareness of the benefits that trees and forestry can bring to flooding and the associated reduction of peak flows 1) Evaporation of rainfall from canopy and 2) Transpiration of heavy rain into the forest soils and geology.	
Maintenance (90320007)	A	Local Authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. The Local Authorities produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.	Local Authorities	<p><b>Clackmannanshire Council</b> has a prioritised Cyclical Watercourse Inspection and Clearance Regime in operation in Clackmannanshire since 2011. Site specific reports captured via GIS system (to be updated 2018/19) and published on Clacksweb. Additional inspection and clearance input from Community Payback Teams and Local Volunteers (Hillfoots) reported via GIS system.</p> <p><b>Perth and Kinross Council</b> has continued to inspect and assess watercourses. Routine inspections are carried out either annually, six monthly or quarterly, depending on the flood risk associated with each watercourse. Further reactive inspections have been carried out when issues have been highlighted or during times of flooding. Where a flood risk is identified, and clearance and repair works would substantially reduce that flood risk, then those works are included on the Council's clearance and repair schedule and carried out.</p> <p>Perth and Kinross Council also operates a monitoring programme for the inspection and maintenance of road gulleys. Each gulley is</p>	<p><b>Clackmannanshire Council will</b> continue to develop and improve GIS based management system to log and record relevant watercourse maintenance data.</p> <p><b>Perth and Kinross Council</b> will continue to inspect and assess watercourses and carry out clearance and repair works where this would substantially reduce flood risk. Road gulleys will continue to be monitored and cleared as per the gulley monitoring programme.</p> <p>Stirling Council will continue to inspect and assess watercourses and carry out clearance and repair works where this would substantially reduce flood risk.</p> <p><b>Stirling council</b> will continue to inspect watercourses to identify flood risks and to carry out the fortnightly inspection and clearance regime which has resulted in a reduction in localised and repeat flooding incidents. Budgets have however been reduced therefore the volume of clearance and repair works have reduced. They continue to be carried out on a risk based priority. The council will continue to seek methods of continuing a sustainable level of maintenance activities through volunteers and criminal justice support.</p>

		<p>inspected, and cleared if required, once per year.</p> <p>The monitoring programme identifies gulleys that are more at risk from blockage so that they can be checked more frequently. It also enables the Council to reduce the frequency of inspections where gulleys are found to require less frequent maintenance. Through this monitoring, the Council is developing a more strategic and sustainable approach to gully maintenance. The public can also contact the Council to highlight issues with any road gulleys.</p> <p><b>Stirling Council</b> have a successful GIS based watercourse inspection regime in place which identifies risks and hazards. Annual inspections are carried out in stretches identified as being higher risk areas. Where problems are identified and clearance and repair works would substantially reduce that flood risk, those works are prioritised on a risk basis and included on the Council's clearance and repair schedule and carried out as annual budgets allow.</p> <p>Where the problems reside in private property the council will notify landowners of their riparian responsibilities. There are plans to expand this notification to involve criminal justice colleagues and arrange clearance works where landowners are amenable to this work being carried out on their behalf.</p> <p>The council also have a fortnightly maintenance regime in place where key hot spot locations have been identified, usually where there is a repeat</p>	<p><b>Fife Council</b> have an on-going inspection and maintenance regime in place.</p> <p><b>Falkirk Council</b> will continue to undertake the priority maintenance schedule as budgets allow.</p>
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			<p>flooding history or a high flood risk identified. Any additional works identified are added to a schedule of works and prioritised based on a risk based approach and the available budget.</p> <p><b>Fife Council</b> have an inspection and maintenance regime in place.</p> <p><b>Falkirk Council</b> has a priority maintenance schedule is in place and implemented by a Roads Direct Labor Organisation Team</p>	
<b>Emergency plans/response</b> (90320014)	<b>G</b>	<p>Providing an emergency response to flooding is the responsibility of many organisations, including Local Authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>	<p>Category 1 and 2 Responders</p> <p>Over and above civil contingencies planning <b>Stirling and Clackmannanshire councils</b> have established a formal Flood Partnership Group between Scottish Fire &amp; Rescue Service, Scottish Flood Forum, SEPA, Emergency Planning Officers and flooding teams from each Local Authority and Scottish Water as of June 2017. There is potential to expand the working group to include other agencies or voluntary sector. Ongoing dialogue and quarterly meetings between parties to better plan joint emergency responses to community risks.</p> <p><b>Perth and Kinross Council</b> further developed its Flooding Emergency Response Plan in October 2017. The Plan is designed to ensure that contingency measures are in place for a coordinated and flexible response to flooding incidents to mitigate the effects of flooding emergencies on people, property and infrastructure.</p> <p><b>Fife council</b> Flood emergency plan was updated in</p>	<p><b>Clackmannanshire council</b> will continue to develop partnership working model and embed communications links between key group stakeholders and also to expand group membership to other potential partners (e.g. volunteer sector)</p> <p><b>Perth and Kinross Council</b> will continue to implement the Flooding Emergency Response Plan when required. Where no incidents have occurred within a 12 month period a table top exercise will be conducted to test the response plan. This exercise may include consideration of flooding incidents, severe weather, widespread flooding, storm events, etc.</p> <p><b>Stirling Council</b> will continue to develop a partnership working model and embed communications links between key group stakeholders and also to expand group membership to other potential partners (e.g. volunteer sector)</p> <p><b>Fife Council</b> emergency planning and response is an on-going process.</p>

			November 2016 and will be reviewed in November 2018	<b>Falkirk Council</b> will continue to operate and review emergency plans
			<b>Falkirk Council</b> have Emergency Plans linked to flood risk in place	
<b>Planning Policy</b>	<b>G</b>	<p><a href="#">Scottish Planning Policy</a> and accompanying <a href="#">Planning Advice Notes</a> set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see <a href="#">Annex 3</a> of the Forth Local Flood risk management plan. A comprehensive list of the land use planning objectives and actions for the Plan can be found in <a href="#">Annex 6</a> of the Plan.</p>	<p>Planning Authorities and SEPA</p> <p><b>Clackmannanshire Council</b> The Council aims to adopt the LDP Review in 2020. This may include revised Supplementary Guidance on Flooding and Drainage, depending on the outcome of the Planning Bill, which is currently proposing scrapping statutory supplementary guidance. Non-statutory guidance on flooding and drainage could still be produced by the Council.</p> <p><b>Perth and Kinross Council</b> The current Perth and Kinross Local Development Plan (LDP1) contains planning policy and development allocations which ensure that new development at medium to high risk of flooding is avoided (unless flood protection measures to the appropriate standard (1:200 years) already exist and are maintained, are under construction, or are a planned measure in a current flood risk management plan). SEPA and Perth and Kinross Council's flooding team input to the planning application process as necessary to implement flood risk policy and ensure there is an appropriate assessment and mitigation of flood risk as detailed development proposals come forward. The Council's flooding team has reviewed 872 planning applications since the start of the 2016/17 financial year as a consultee in the planning process. The</p>	<p><b>Clackmannanshire Council</b> The Council aims to adopt the LDP Review in 2020. This may include revised Supplementary Guidance on Flooding and Drainage, depending on the outcome of the Planning Bill, which is currently proposing scrapping statutory supplementary guidance. Non-statutory guidance on flooding and drainage could still be produced by the Council.</p> <p><b>Perth and Kinross Council</b> The Council will publish LDP2 and revised Supplementary Guidance on Flooding and Drainage. Following consultation on the Perth and Kinross Proposed LDP2, the Council considered the representations made to the Proposed Plan and approved responses to these representations at a special Council meeting in August 2018. The Proposed Plan was then submitted to Scottish Ministers for examination on 14 September 2018. The Reporter will examine the unresolved issues. Following amendment of the LDP2 in line with the Reporter's recommendations (unless there are reasonable and justifiable grounds for not accepting some of the recommendations), the Council will adopt LDP2. This is anticipated to be in July 2019.</p> <p>The existing Supplementary Guidance (SG) on Flood Risk and Flood Risk Assessments (Developers Guidance</p>

			<p>Council's flooding team has also provided additional advice on flood risk management to the Planning Authority out with these formal consultations. The Council is reviewing LDP1, which was adopted in February 2014 to produce LDP2. LDP1 includes the policies and development allocations against which the planning applications for development are considered. Key milestones in its review have included publication and consultation on the Main Issues Report (consulting on key issues and changes from the adopted LDP1) in December 2015 and the publication and consultation on the LDP2 Proposed Plan (the settled view of the Council) in December 2017. To inform this process, the Council has undertaken a Strategic Environmental Assessment (SEA) and prepared an Environmental Report to identify, describe and evaluate the likely significant effects on the environment. The SEA includes the consideration of flood risk in site assessment and policy work, and involved engagement with SEPA and the Council's flooding team.</p> <p><b>Stirling Council</b></p> <p>Flood risk information including the local flood risk management plan feed into the local development plans for both Stirling Council and LLTNP. Both planning departments are informed of changes and developments through engagement with the flooding team and local advisory group meetings</p> <p><b>Fife Council</b></p> <p>The Planning Policy has been amended in the Strategic plan to ensure Flooding is considered at the outset of the planning process in line with</p>	<p>note on Flooding and Drainage) is also currently being reviewed and will be revised and consulted on in January 2019 with a view to adoption alongside LDP2. The main aspects that are being updated are the guidance on climate change; the requirements for sustainable urban drainage systems (SuDS) and the ongoing maintenance responsibilities, including information on potential maintenance agreements with Scottish Water under Section 7 of the Sewerage (Scotland) Act.</p> <p><b>Stirling Council</b> will continue work closely with both planning authorities in the development and implementation of local development plans to incorporate flood risk management objectives into the process from the outset.</p> <p><b>Fife council</b> will continue to make certain the Planning Policy has been amended in the Strategic planning process to ensure Flooding is considered at the outset of the planning process in line with current Scottish Planning Policy.</p> <p><b>Falkirk Council</b> Development Plans has will continue to be reviewed and developed to reflect flood risk</p>
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			<p>current Scottish Planning Policy. A process has been put in place to ensure Flood Risk Assessments, Sustainable Drainage system designs and any other relevant information is provided on submission of Planning Application, otherwise application is returned as incomplete.</p> <p><b>Falkirk Council</b> Development Plans has been developed to reflect flood risk.</p> <p><b>Loch Lomond and the Trossachs National Park,</b> LLTNP Planning Authority have a number of flooding policies in the local development plan which are used by development management during the assessment of planning applications and we are monitoring their usage as part of the monitoring of the Local Development Plan. We also have highlighted flooding constraints in our recently approved planning guidance for our development sites in Callander south.</p>	
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## Chapter 4: Progress with PVA-specific Actions

This section sets out an assessment of the progress towards implementing actions that are specific to each of the 12 PVA as shown in Figure 2. Assessments of the progress of actions within each PVA are presented.

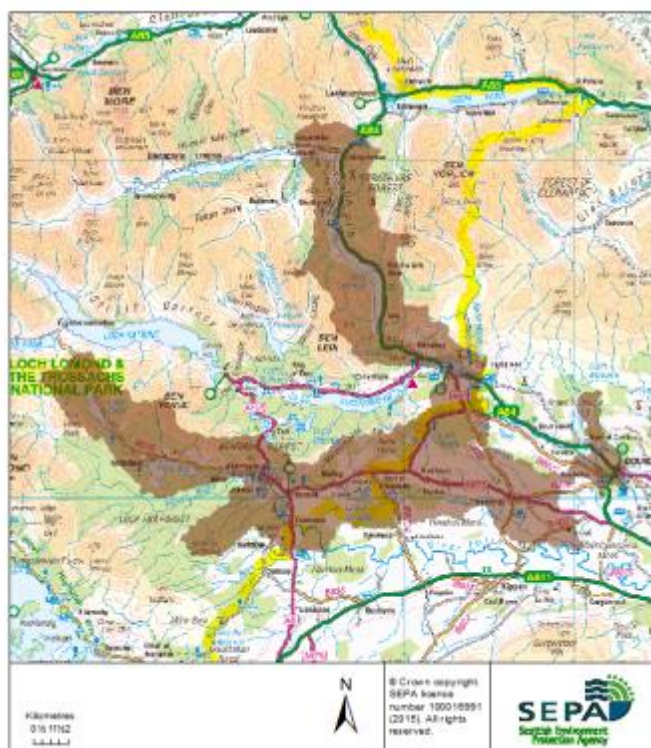
There are no specific actions identified for 'property level protection scheme' and 'site protection plans' actions. Consideration of property level protection schemes will be included in the 'flood protection study', 'surface water plan/study' and/or 'emergency plans/response' actions. Site protection plans will be identified through these same 'study' actions and also 'planning policies' action.

DRAFT



## 4.1 Trossachs (Potentially Vulnerable Area 09/01)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Rivers Forth and Teith



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### Summary of Progress for Trossachs

There are approximately 200 residential properties and 90 non-residential properties at risk of flooding. The Annual Average Damages are approximately £770,000. Further information can be found in [LFRMP](#) under PVA 09/01.

### Key progress in reducing the impacts of flooding since publication:

The two most significant recorded flooding events occurred in Aberfoyle in December 2015 impacting residential properties, business premises and road access. Callander was impacted by the same flooding events though less extreme and fewer properties impacted.

**Aberfoyle flood alleviation scheme** will not be constructed in cycle one as originally planned. Due to flooding events and further public consultation the

**Become a Community Flooding Volunteer** 

**Want to learn more about your local area and help reduce flood risk?**

We're launching an exciting new project with Stirling Council to involve local residents in monitoring flood "hotspots" in the Strathard and Aberfoyle catchment

**Aim:** to regularly photograph vantage points pre-selected to monitor flood "hotspots" to record visual and written observations when flood events occur

It is anticipated that the data collected can provide a clearer idea of which sections of B829 flood first and what remedial works can be undertake

**Get in touch to find out more**  
**Amanda Malcolm - a.malcolm@tcv.org.uk**  
**07917 460 488**

No previous knowledge of the subject required. We will provide all training, support and guidance for the project

Figure 4: Community Flood Warning preparation

scheme proposal has been significantly changed increasing the standard of protection from 1 in 10 years, to 1 in 100 with multiple benefits. The scheme design will be completed in cycle 1 and submitted to the national prioritisation process for cycle 2 funding.

**Callander flood alleviation scheme** design is progressing for a 1 in 50 year standard of protection for businesses, residential property and trunk road network. Public consultation is planned in 2018/19. The scheme constructions aims to be completed within the current Plan cycle.

A **Community flood warning** project is being undertaken in Aberfoyle and the wider Strathard area. The council are working in partnership with The Conservation Volunteers (TCV) to undertake this project with support from the Scottish Flood Forum. The project will encompass awareness raising work within the local primary school.

A **new flood warning** is planned for Aberfoyle and SEPA have undertaken a lot of preparatory work installing rain and river gauges and gathering background information from Stirling council in preparation for delivery of this project. There are significant challenges to overcome in terms of getting a reliable signal.

The **Strathard Initiative group** formed in 2015 is led by the Community Trust and



Figure 5: Community Flood Pod



Figure 7: Leaky dams on one of the watercourses running from the Craggs in Callander

SEPA in partnership with FCS, LLTNP, the council and SNH. The group have completed a **natural flood management study** and carried out a huge amount of community engagement. As a result they have installed **trial natural flood management features** in parts of the Duchray water catchment as well as monitoring equipment to measure the effectiveness of these measures on flood risk reduction and ecosystem services.

**Flood pods** have been installed in Callander and Aberfoyle to promote self-help. The pods contain lightweight sandbags replacements for use in emergency to protect property against flooding. The intention is for flood pods to feature in community resilience planning; Callander has a community resilience plan in place, until a community resilience plan is established in Aberfoyle the Trossachs search and rescue are leading facilitation of the deployment of these products in the village. They have also offered services to assist other communities enact resilience plans. See Figure 5 and 6.



Figure 6 Trossachs search and rescue issuing flood pod contents October 2018

**Maintenance works** There are 36 key locations inspected and cleared on priority



schedule in this PVA The council have installed replacement pipe crossings on the B829 between Milton and Kinlochard to alleviate road flooding. The council has installed leaky dams in Callander on a trial basis to determine whether they can slow down the flow on small burns to alleviate pressure on the underground pipes See figure 7 opposite.

## Overview of actions to manage flooding in Trossachs

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/01	R		G	G	G	A	G	R	G	G		G	A	G	A		G	G

## Summary of progress of actions to manage flood risk in the Trossachs (PVA 09/01)

Action	Status (Red; Amber; Green)	Description	Delivery Lead	Planned Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
<b>Flood Protection Works (90020006)</b>	<b>R</b>	<b>Aberfoyle Flood Alleviation scheme</b> Scheme for range of flooding likelihoods investigated for Aberfoyle. Scheme to include: mixture of flood walls and embankments dependent on space restrictions and is linked to the provision of flood warning by SEPA.	Stirling Council	2017/18	2016 study complete  2017 Scheme alignment changed and agreed on following further public consultation and significant flooding events. Increase in standard of protection from 1 in 20, to 1 in 100 to reflect public concern and flood impacts from 2015 flooding events.  2018 Detailed design commenced,  2018 stakeholder engagement on new design commenced. 2018 engagement and consultation on proposed design with other	<b>Detailed design</b> to be complete <b>2019</b> .  <b>Flood Order</b> to be promoted 2020.  <b>Construction</b> phase aimed to complete by <b>2024*</b> .  *Construction phase dependent on successful grant funding bid in 2019.

		<p>Scheme is dependent on local authority funding and requires further community engagement.</p> <p>Duchray catchment project supplements scheme on NFM.</p>			<p>organisations and groups commenced.</p> <p>2019 Design will be submitted to cycle 2 national prioritisation process.</p>	
<p><b>Flood Protection Works (90030006)</b></p>	<b>A</b>	<p><b>Callander Flood alleviation scheme</b></p> <p>The scheme will consist of flood walls within the Meadows car park vicinity protecting business, residential properties and the trunk road from the 1 in 50 year event. It will aim to</p>	<p>Stirling Council</p>	<p>2018-2019</p>	<p>Phase 1 of design process drafted June 2018.</p> <p>Consultation of SEPA on hydraulic model and hydrology followed with resulting changes and revisions.</p> <p>Phase two of scheme design in development with public consultation throughout design planned in 2018/19. Anticipated completion in 2020</p>	<p><b>Detailed design to complete by 2020</b></p> <p><b>Flood order to be promoted 2020</b></p> <p><b>Construction phase 2020 - 2022</b></p>

		improve pedestrian safety and enhance the public realm. In accordance with the Flood Risk Management Strategy, Stirling Council (and SEPA as the licencing authority)				
<b>New Flood Warning (90320010)</b>	<b>G</b>	Flood warning is required for properties at risk of flooding from the River Forth in Aberfoyle and flooding of the B829 single access road from Aberfoyle to Milton, Kinlochard, Stronachlacher and	SEPA	2018-2020	New hydrometric infrastructure investigated and installed. However remote area is posing data communication challenges and new communication methods are being trialled. Initial investigations into new flood warning areas have been completed.	Finalise installation of hydrometric infrastructure and resolve communication issues. Develop flood forecasting capabilities.



		Inversnaid. Further feasibility assessment will be required to assess the delivery potential of a new flood warning scheme in this area.				
<b>Flood Protection Study (90020005)</b>	<b>G</b>	A flood protection study has been carried out by Stirling Council for Aberfoyle assessing flood storage and sediment management. No economically viable option has been identified (benefit cost ratio of 0.16) but Stirling Council plan to self-fund a	Stirling Council	2016-2021	The optioneering study for Aberfoyle including NFM scoping document were completed in 2016. The study was then revisited and revised to consider 11 different defence options and higher standards of protection following two significant flood events and public consultation on low level protection proposals. A 1 in 100 year scheme was identified which met community requirements including protection of access and egress to the school. Alignment was agreed 2017 based on the optioneering	Delivered in 2016

		<p>low level flood protection scheme.</p> <p>The study can be revisited in future to further examine options to reduce flood risk in conjunction with investigations of flood warning by SEPA. In accordance with the FRM Strategy, Stirling Council will seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Trossachs Woods SAC.</p>			<p>outputs moving to scheme design phase.</p>	
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<p><b>Natural Flood Management Study (90020003)</b></p>	<p><b>G</b></p>	<p>The ongoing Strathard Initiative is looking at a range of natural flood management options within an ecosystem services project including runoff control and sediment management to help reduce flood risk in Aberfoyle. The study has been undertaken in partnership with SEPA, Loch Lomond and the Trossachs National Park and Forestry Commission Scotland, Forest</p>	<p>SEPA</p>	<p>2016</p>	<p>Study Complete. Action on the ground described under <b>other actions</b></p>	<p>Study Complete</p>
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		Research, Scottish Natural Heritage and Stirling Council and is due to be completed in 2016. The study should inform any future flood protection studies.				
Surface Water Plan/Study (90330018)	A	SWMP for Callander to set objectives and actions to manage surface water flood risk. SWMP will incorporate outputs from Scottish Water Assessments and previous studies as appropriate	Stirling Council	2017 * 2022	This surface water management plan has not yet been progressed due to budget constraints. However, as part of the drainage strategy for the proposed Callander flood alleviation scheme some investigation has been carried out that will form inform the surface water management plan once commissioned.	Planned to complete by end of cycle 1 LFRMP in 2022
Strategic		Scottish Water will	Scottish	2016 -	Complete	Section 16

mapping and modelling (90320019)		undertake further investigation and modelling in the Callander sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.	Water	2018		assessment for Callandar completed April 2017.
Strategic mapping and modelling (90320016)	<b>G</b>	Surface water mapping developments: improved data areas across LPD + use of Callander SWMP results if appropriate.	SEPA	2015 - 2022	SEPA's current Surface water hazard maps use design rainfall estimates based on FEH99 methodology, this has now been superseded by FEH13 methodology. The FEH13 dataset contains the latest science and understanding of rainfall across Scotland and represents a significant	This action will not be taken forwards as described. SEPA will develop new Surface water flood hazard maps over the remainder of Cycle 1. It is

					<p>change in rainfall amounts compared to FEH99 dataset, as such it is no longer consider appropriate to deliver this action as originally intended.</p> <p>anticipated that updated flood mapping from this revised action will be available early in Cycle 2.</p> <p>Alongside this SEPA will investigate the feasibility of developing an interim approach to assess the change in Surface water hazard (and risk) associated with FEH13, such that we could consider it in the development of the 2021 FRM Strategies.</p>
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<b>Maintain Flood Protection Scheme (90020017)</b>	<b>R</b>	Once Callander and Aberfoyle Flood alleviation schemes are completed the structural integrity will have to be maintained to sustain the designed level of protection.	Stirling Council	2018-2022	<p>Aberfoyle flood alleviation scheme will not be constructed until cycle two of the local flood risk management plans therefore there will be no maintenance requirements until that time.</p> <p>Once Callander flood alleviation scheme is constructed a maintenance schedule will be carried out. The schedule content will depend upon the construction materials for the scheme and development of this schedule will form part of the design package.</p>	Maintenance of both Callander and Aberfoyle schemes will be undertaken on a schedule developed in tandem with the scheme once works are complete.
<b>Maintain flood warning</b>	<b>G</b>	Continue to maintain the Callander and Deanston flood warning areas (Stirling river flood warning scheme).	SEPA	On-going	SEPA has continued to operate the flood warning service	SEPA will continue to operate the flood warning service

<b>Community Flood Action Group (90020012)</b>	<b>G</b>	<b>Aberfoyle</b> Flood Forum operates in this area. The membership includes representation of residents and the business community. The group is a sub-section of the community council and acts as a pressure group to promote flooding concerns in Aberfoyle and wider area.	Community	On-going	The flood group have continued to work as a pressure group and to provide information and feedback to the council on the project The council are facilitating the community in the provision of community flood pods on a trial basis. If the pods are managed and used effectively a case can be made for these to become permanent features in the community.	On-going activity will continue as long as the community support it.
<b>Community Flood Action Group (90030012)</b>	<b>G</b>	<b>Callander</b> Flood Forum operates in this area. The forum takes on flood	Community	On-going	The flood forum have merged into a great community resilience group in 2018. The group, with assistance from the councils resilience and risk	On-going activity will continue as long as the community support



		warden duties, raises public awareness, liaises with relevant authorities and provides assistance to residents on property protection			team have developed an active community resilience plan which has been enacted when flood warnings have been issued The council are facilitating this work in the provision of community flood pods on a trial basis. If the pods are managed and used effectively a case can be made for these to become permanent features in the community.	the group.
<b>Flood forecasting</b> (90320009)	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	
<b>Self help</b> (90320011)	<b>G</b>	See Progress with LPD-wide Actions and Community flood actions.	Individuals	On-going	See Progress with LPD-wide Actions and community flood group actions. Stirling Council started working in partnership with TCV in 2018 to develop a community flood warning in the Strathard area, this is mainly focussed on road flooding for safe access.	See Progress with LPD-wide Actions and Community flood actions. The project will initially run for a year from April 2018 – April 2019, if the project proved

						successful it can be supported further.
<b>Awareness raising</b> (90320013)	<b>G</b>	See Progress with LPD-wide Actions.	Stirling Council and SEPA	On-going	See Progress with LPD-wide Actions for general information. Stirling council are working in partnership with TCV on a community flood warning project and held an event in Aberfoyle primary school to raise awareness of the risks of flooding and what action the council are taking in their local area.	On-going community engagement through different opportunities will be taken throughout the plan cycle.

<b>Maintenance</b> (90320007)	<b>A</b>	See Progress with LPD-wide Actions.	Stirling Council	On- going	See Progress with LPD-wide Actions. Some specific local works have been undertaken to reduce road flooding at key locations to maintain access along the A81 into Aberfoyle and along the B829 between the main village and Kinlochard.  There are currently 31 locations within the Trossachs PVA that are inspected and necessary maintenance undertaken on a fortnightly basis. They are also checked and cleared when Flood Alerts are issued by SEPA or blockages reported by members of the public.	On-going activity will be prioritised and carried out based on annual budgets.
<b>Emergency plans/response</b> (90320014)	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On- going	See Progress with LPD-wide Actions	See Progress with LPD-wide Actions
<b>Planning Policy</b>	<b>G</b>	See Progress with LPD-wide Actions	SEPA and Planning	On- going	See Progress with LPD-wide Actions	See Progress with LPD-wide Actions

(90010001)			Authorities			
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## 4.2 Braco (Potentially Vulnerable Area 09/02)

Local Plan District	Local authority	Main catchment
Forth	Perth and Kinross Council	Allan Water



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### Summary of Progress for Braco

There are approximately 20 residential properties and 10 non-residential properties at risk of flooding. The Annual Average Damages are approximately £29,000. Further information can be found in the LFRMP under PVA 09/02.

There have been no significant weather events in this PVA since the publication of the Forth Local FRM Plan.

#### Key progress in reducing the impacts of flooding since publication:

Perth and Kinross Council supports communities to become more resilient to flooding. The Council has **developed its website** to provide more advice and information on flood risk management. The **Braco and Greenloaning Community Resilience Group** has also been established in this area.

Perth and Kinross Council has not prioritised any specific measures in this area but will continue with awareness raising activities when developing any proposals for the

remaining actions set out in the Tay Local FRM Plan. The Council will also continue to carry out its other general actions to manage flood risk, including **inspections and any necessary maintenance of the watercourses** in the PVA.

### Overview of actions to manage flooding in Braco

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/02										G			G	G	G		G	G

### Summary of progress of actions to manage flood risk in the Braco (PVA 09/02)

Action	Status	Description	Delivery Lead	Planned Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete /
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						address delay
Flood forecasting (90320009)	<b>G</b>	See Progress with LPD- wide Actions	SEPA	Ongoing	See progress with LPD-wide Actions in Table 2	See planned actions in Table 2
Self help (90320011)	<b>G</b>	See Progress with LPD-wide Actions	Individual	Ongoing	<p>Perth and Kinross Council supports communities to become more resilient to emergency situations, including flood events.</p> <p>Communities have been engaged through the multi-agency Local Resilience Partnership Community and Business Resilience Group, led by the Council.</p> <p>The Braco and Greenloaning Community Resilience Group has been established in this area and an emergency rest centre has been established as part of the A9 Trunk Road Community Emergency Plan.</p>	<p>Perth and Kinross Council will continue to support communities to become more resilient to flooding.</p> <p>The Council will also continue to support communities to develop community resilience groups and emergency plans.</p>
Awareness raising (90320013)	<b>G</b>	SEPA and the responsible authorities have a	Responsible Authorities and SEPA	Ongoing	See Progress with LPD-wide Actions. In Table 2	Perth and Kinross Council will continue with



		duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.				awareness raising activities when developing proposals for the remaining actions in the Forth Local Flood Risk Management Plan.
Maintenance (90320007)	<b>G</b>	See Progress with LPD-wide Actions in Table 2	PKC, Land/Asset managers	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2
Emergency plans/response (90320014)	<b>G</b>	See Progress with LPD-wide Actions in Table 2	Category 1 and 2 Responders	On-going	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2
Planning Policy (90010001)	<b>G</b>	See Progress with LPD-wide Actions in Table 2	Planning authority	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2

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### 4.3 Dunblane and Bridge of Allan (Potentially Vulnerable Area 09/03).

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Allan Water



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### Summary of Progress for Dunblane and Bridge of Allan

There are approximately 370 residential properties and 50 non-residential properties at risk of flooding. The Annual Average Damages are approximately £550,000. LFRMP under PVA 09/03

#### Key progress in reducing the impacts of flooding since publication:

An **integrated catchment study** is in progress and is being led by Scottish Water in partnership with the council. Bridge of Allan is the largest target area for the council within this study. The outcomes of the study will provide information to inform a surface water management plan covering Stirling and Bridge of Allan.



Figure 10: Above, Extreme surface water flooding in August 2012.



Figure 11. Landslide caused by flooding above

A **surface water management study** was undertaken after an extreme rainfall event in August 2012 impacted on Bridge of Allan and Dunblane. As a result of this study and post event mapping, **significant maintenance works** have taken place since publication of the plan to mitigate key sources of surface water flooding on the hillside to the north of Bridge of Allan. The study will feed into a greater long-term surface water management plan for Stirling and Bridge of Allan. See figures 12 - 14 showing flooding impacts and works undertaken to alleviate flooding.

Bridge of Allan **flood alleviation scheme** is currently in development, community engagement has begun in 2018 with assistance from the community council.



Figure 15 Flooding in Bridge of Allan.

**Maintenance works.** There are 12 key locations within the PVA included in priority inspection and clearance schedule

**Criminal Justice.** The council have trialled the use of criminal justice assistance in undertaking watercourse clearance works in 2018. Due to the success of this work the council has aspirations to roll out further works in future.



Figure 12: Maintenance. New drainage work  
Pendriech Road



Figure 13: Maintenance. Extensive new roadside drainage installed to alleviate surface  
water flooding



## Overview of actions to manage flooding in Dunblane and Bridge of Allan (Potentially Vulnerable Area 09/03)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/03	A					G	G	A	G	G			G	G	A		G	G

Action	Status	Description	Delivery Lead	Planned Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Flood protection scheme/works	A	A flood protection scheme has been proposed for Bridge	Stirling Council	2018-2020	The scheme development has been delayed for a number of reasons including availability	Construction phase will be completed by June 2022.

(900070006)		<p>of Allan. The scheme would consist of flood embankments and sheet piling to protect properties from the 1 in 50 year event. In accordance with the Flood Risk Management Strategy, Stirling Council (and SEPA as the licensing authority) will seek to ensure that the works will not have an adverse effect on the integrity of the Kippenrait Glen SAC and River Teith SAC. The proposed flood protection works are partially located on</p>			<p>of background data and technical challenges. The first community engagement session specific to the flood alleviation scheme proposals took place in July 2018 with future engagement sessions to be carried out as the design progresses. Opportunities for collaborative Natural flood management/ river restoration projects will be considered as part of the design.</p>	
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		the Allan Water (water body ID 6832). The physical condition of this river is identified by SEPA to be at less than good status. Opportunities to improve the condition of the river will be considered by coordinating with river basin management planning.				
Surface water plan/study (90050018)	<b>G</b>	SWMP for Dunblane to set objectives and actions to manage surface water flood risk. SWMP will incorporate outputs from ICS as	Stirling Council	On-going	Dunblane: A discrete high level surface water management plan has begun development internally within the council.  Bridge of Allan: phase 1 study for the north side of Bridge of	Plan will be finalised before June 2022

		appropriate / available.				Allan complete 2016, outputs of this along with outputs from integrated catchment study will feed into a strategic surface water management plan for Stirling and Bridge of Allan. This study will not be carried out until outputs from integrated of ICS are available. ICS currently running behind dates published within LFRMP but will be delivered by 2022.	
Surface water plan/study (90160019)	A	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable	Stirling Council	On-going		A surface water management study has been carried out on the upper part of Bridge of Allan and some works have resulted from this to reduce surface water runoff from Pendriech Road. There are other works in design for Blairforkie Drive, Sunnyslaw	

		actions to achieve the objectives. Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process.				Road and Glen Road in future. The study undertaken will feed into a greater surface water management plan covering Stirling and Bridge of Allan. Information from the on-going integrated catchment study being led by Scottish Water will also feed into this surface water management plan.	
Surface water plan/study (90160018)	G	The area must be covered by a surface water management plan or plans that set	Stirling Council	2018-2022		Background information on surface water flood risk has been developed and digitised in preparation for undertaking	Study aims to complete by June 2022, linked to delivery of ICS.

		objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.			a SWMP. Plan will be progressed once ICS has been delivered for Stirling. Outputs from the ICS and the Upper Bridge of Allan Study will feed into the plan.	
<b>Strategic mapping and modelling</b> (90160319)	<b>G</b>	SR 15 Integrated catchment study for the Stirling drainage catchment to support the SWMP process for Stirling and Bridge of Allan by improving understanding of surface water flood risk and the interaction with other sources of flooding.	Scottish Water	2016-2022	Complete Historical Verification	Complete Catchment Flood Assessment by 2022
<b>Maintain flood protection</b>	<b>G</b>	Continue to maintain the existing flood	Stirling Council	On-going		

<b>scheme</b> (90070017)		protection scheme that protects Bridge of Allan. The Bridge of Allan Flood Protection Scheme consists of earth embankments, flood walls and other works.				
<b>Maintain flood warning</b> (90320030)	<b>G</b>	Continue to maintain the Dunblane and Bridge of Allan flood warning areas (Stirling river flood warning scheme).	SEPA	On-going	SEPA has continued to operate the flood warning service	SEPA will continue to operate the flood warning service
<b>Flood forecasting</b> (90320009)	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	
<b>Self help</b> (90320011)	<b>G</b>	See Progress with LPD-wide Actions	Individuals	On-going		
<b>Awareness raising</b>	<b>G</b>	See Progress with LPD-wide Actions	Stirling Council and	On-going	No PVA specific activities have been undertaken	

(90320013)			SEPA			
<b>Maintenance</b> (90320007)	<b>A</b>	See Progress with LPD-wide Actions	PKC, Land/Asset managers	Ongoing	See Progress with LPD-wide Actions for generic information. Specific maintenance in Bridge of Allan includes working with colleague in criminal justice to trial use of their services in clearing debris which poses flood risk from watercourses and trash screens. There are also locations within Dunblane and Bridge of Allan that form part of the councils fortnightly inspection and clearance regime. These are locations that either have a history of flooding or are considered critical to flood mitigation.	
<b>Emergency plans/response</b>	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2	On- going	See Progress with LPD-wide Actions	

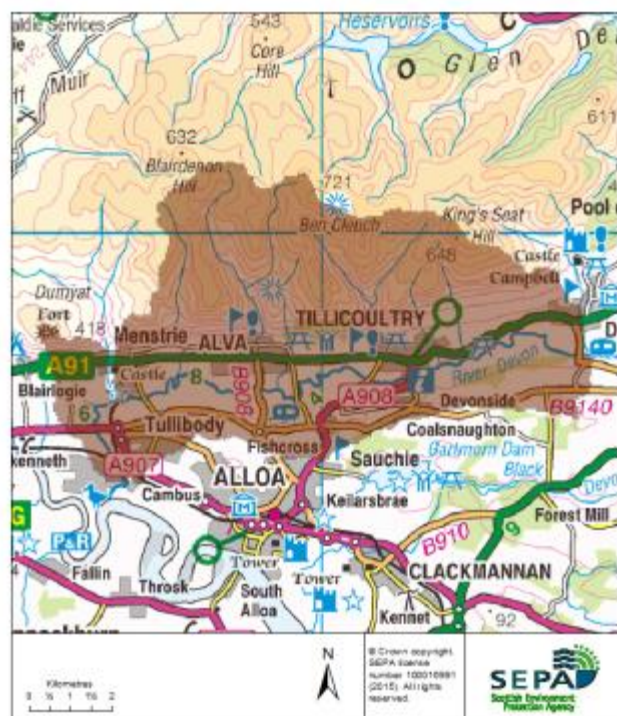
(90320014)			Responders			
Planning Policy (90320014)	<b>G</b>	See Progress with LPD-wide Actions	Planning Authority and SEPA	Ongoing	See Progress with LPD-wide Actions	

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## 4.4 Hillfoots (Potentially Vulnerable Area 09/04)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Allan Water



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### Summary of Progress for Hillfoots

There are approximately 720 residential properties and 170 non-residential properties at risk of flooding. The Annual Average Damages are approximately £1.6 million. See Forth LFRMP PVA 09/04 for more information.

### Key progress in reducing the impacts of flooding since publication:

The Council has delivered on it's actions from "The Forth LFRMP - 2016 to 2022" to produce **three flood option appraisal studies**. The actions required studies covering Menstrie and Tillicoultry and a strategic SWMP for the Council area. Local Flood Groups have been established in Menstrie (MCRG) and Tillicoultry (TIDECO). These groups receive continued support from SFF, TCV, SFRS and the Council. As a result the council have provided community scale flood pods in Menstrie and Tillicoultry which contain equipment to help protect against flooding. The SFF have provided training to the group members and other flood volunteers in how to use the equipment and have assisted in developing community



**Figure 15** above, **Figure 16** below: Local flood volunteers undergoing watercourse inspection and clearance training with TCV and Clackmannanshire council.



flood action plans for each group.

In addition to the Council's **watercourse inspection and clearance regime**, which is largely delivered by the Community Payback Team, flood volunteers have been recruited by TCV and are now trained to safely inspect and clear small watercourses of debris. The flood volunteer project started in Menstrie and has since been expanded by TCV to support other flood volunteers in Alva, Tillicoultry and Dollar. Key locations in each community are now inspected with information passed to the council for action if volunteers are unable to clear blockages. For more information on the project, or to become a flood volunteer see [appendix 4](#).



An **awareness raising event** took place at Menstrie Primary School in March 2017 in partnership with school staff and pupils. This was highly

successful event with over 300 people in attendance.

**Figure 16:** Photographed are some partners who took part in the event including staff from SFF, TCV, Heriot Watt University, Menstrie Primary School and the council.

A joint **community engagement and flood warning project** has been taken forward as a partnership between the Council, SEPA, SFF and TCV. The project includes

trialling a new small scale flood warning system called "River track". River Track monitors water levels at key locations on the Menstrie Burn and will produce audible alarms when agreed threshold levels are reached for the residents (and the Menstrie Care Home) who are linked to the system.

### Overview of actions to manage flooding in Hillfoots (Potentially Vulnerable Area 09/04)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/04				G		G	G	G		G		G	G	G	G		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete /
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						address delay
<b>Flood protection study (90100005)</b>	<b>G</b>	Fluvial flood protection / NFM study for Menstrie. Study requires data collection (rainfall, river gauge) to aid analysis and should build on existing NFM study and works but look at wider catchment area. Study to consider: runoff control, sediment management, PLP (although flood warning times are short).	Clackmannan-shire Council	2016-2021	Stakeholder workshop on draft shortlist of actions proposed 18/07/18. Target date for completion and publication of Flood study Options Report, end of September 2018	Monitor agreed revised consultant programme to ensure completion of study and publication of study document by end of October 2018.
<b>Flood protection study (90110005)</b>	<b>G</b>	Fluvial flood protection scheme for Tillicoultry. Study to consider: flood storage, direct flood defences, Property Level Protection, sediment management and natural flood management.	Clackmannan-shire Council	2016-2021	Study Complete	Study Complete

Surface water plan/study (90080018)	G	SWMP for Dollar to set objectives and actions to manage surface water flood risk. SWMP will incorporate outputs from ICS as appropriate / available.	Clackmannan-shire Council	2018-2021	Draft sections of "Clackmannanshire Council Strategic Surface Water Management Plan" (in compliance with SEPA's current technical guidance document), coming forward for comment by technical stakeholders. Phase 3 ("Setting SMART Objectives") issued June 2018 for comment by technical stakeholders. Workshop for technical stakeholders planned 23/08/18. Target date for publication of Final study document is end of September 2018.	Monitor agreed revised consultant programme to ensure completion of study and publication of study document by end of September 2018
Surface water plan/study (90260018)	G		Clackmannan-shire Council	2018-2021		



<b>Surface water plan/study (ICS)</b> (90260019)	<b>G</b>	SR 15 Integrated catchment study for the Alloa and wider drainage catchment to support the SWMP process for Alloa, Alva, Menstrie, Tillicoultry, Coalsnaughton and Devonside by improving understanding of surface water flood risk and the interaction with other sources of flooding.	Scottish Water	2016-2021	Scoping exercise confirmed limited to no interaction between sewer system and watercourses. ICS study complete at scoping stage	Output delivered - ICS was not required
<b>Strategic mapping and modelling (Section 16)</b>	<b>G</b>	Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.	Scottish Water	2016-2021	The Scottish Water assessment of flood risk within the sewer catchment has been completed. The assessment helps to improve knowledge and understanding of surface water flood risk	Complete
<b>Maintain flood protection</b>	<b>G</b>	Continue to maintain the existing formal flood		On-going	GIS based mapping system captures and records annual	Continue to inspect (annually)

<b>scheme</b> (90100017)		defences at Elistoun Drive the River Devon.				maintenance inspections of Flood Protection Scheme (raised embankment) at Elistoun Drive, Tillicoultry.	and maintain as necessary flood embankment at Elistoun Drive, Tillicoultry
<b>Maintain flood warning</b> (90320030)	<b>G</b>	Continue to maintain the Rackmill Dollar, Sterling Mills Tillicoultry, Glenfoot Bridge at Marchglen, River Devon at Alva, River Devon at Cambus Weir and the Menstrie Industrial Site flood warning areas which are part of the Devon river flood warning scheme.	SEPA	On-going		SEPA has continued to operate the flood warning service	SEPA will continue to operate the flood warning service
<b>Flood forecasting</b> (90320009)	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going		On-going	
<b>Community flood action groups</b> (90100012)	<b>G</b>	Tillicoultry Flood Action Group operates in this area. The group aims to increase community resilience to	Community	On-going		Tillicoultry Flood Group (TIDECO) continues to meet regularly with Council (Emergency planning and	On-going

		flooding.			<p>flood risk management), Scottish Fire &amp; Rescue Service, Scottish Flood Forum and Scottish Water staff attending meetings. Email address and Facebook page established. Terms of reference agreed.</p> <p>Recognised by Tillicoultry Community Council. Flood Pod Established adjacent to local fire station. Local flooding volunteers operating in the area and linked to group. These volunteers are managed by The Conservation Volunteers and the Council.</p>	
Community flood action groups (90110012)	<b>G</b>	Menstrie (The Charrier) Flood Action Group operates in this area. The groups aim to increase	Community	On-going	Menstrie Flood Group continues to meet regularly with Council (Emergency planning and flood risk	On-going



		community resilience to flooding.				management), Scottish Fire & Rescue Service, Scottish Flood Forum and Scottish Water staff attending meetings. Clackmannanshire Tenants & Residents Association Federation and Ochilview Housing Association staff (representing residents of The Charrier) also in attendance. Email address and Facebook page established. Terms of reference agreed. Recognised by Menstrie Community Council. Flood Pod Established adjacent to local fire station. Local flooding volunteers operating in the area and linked to group. These volunteers are	
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					managed by The Conservation Volunteers and the Council.	
<b>Community flood action groups</b> (90120012)	<b>G</b>	Alva (Cochrane Crescent/ Grodwell Drive) Community Flood Action Group operates in this area.	Community	On-going	This group has not come back into being as yet.	Further work ongoing to establish community links, in a similar manner to that used for Menstrie, with Alva Primary School and thereby plan to set up local flood group in Alva. Intention is to extend engagement model to established local flood groups in the remaining Hillfoots

						Villages.
<b>Self help</b> (90320011)	<b>G</b>	See Progress with LPD-wide Actions for general information.	Individuals	On-going	Clackmannanshire Council supports communities to become more resilient to emergency situations, including flood events. Communities have been engaged through direct efforts led by the Council. Local flood groups have been established and operate in Menstrie and Tillicoultry. In support of these groups flood pods have been installed in these areas with group members having access to the PLP products and other equipment within. These groups are also developing Community Resilience Plans with assistance of the Council's FRM and EPO	Clackmannanshire Council will continue to support communities to become more resilient to flooding and will continue efforts to develop other such community groups, primarily along the remaining Hillfoots Villages where the risk is highest. PLP products are to be fitted to Council operated at risk properties, specifically at the

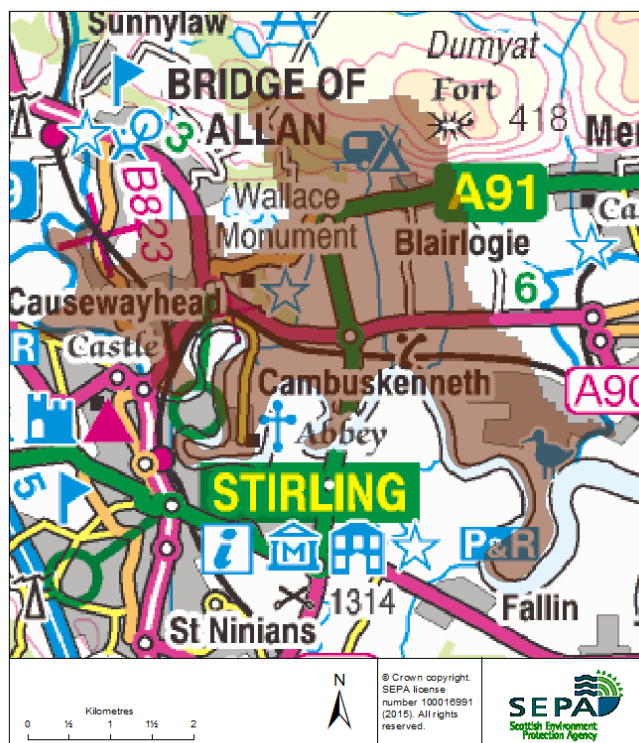
					officers, SFF and The Conservation Volunteers (TCV). Efforts continue, in partnership with the Council and SFF/TCV, to raise awareness of the existence of the groups	Menstrie Care Home, Menstrie.
<b>Maintenance</b> (90320007)	<b>G</b>	See Progress with LPD-wide Actions for general information.	Clackmannanshire Council	On-going	Prioritised Cyclical Watercourse Inspection and Clearance Regime in operation in Clackmannanshire since 2011. Site specific reports captured via GIS system (to be updated 2018/19) and published on Clacksweb. Additional inspection and clearance input from Community Payback Teams and Local Volunteers (Hillfoots) reported via GIS system.	Develop and improve GIS based management system to log and record relevant watercourse maintenance data.

<p><b>Awareness raising</b> (90320013)</p>	<p><b>G</b></p>	<p>See Progress with LPD-wide Actions for general information.</p>		<p>On-going</p>	<p>On-going Through Education Scotland, the Council established local links with Menstrie Primary School and The Conservation Volunteers (TCV) in 2016/17 to set up a project to glean local flood volunteers and link with STEM subjects within the primary school. This led to community awareness raising event in Menstrie PS, March 2017. 300 attended. Project includes ongoing contact between TCV and Menstrie PS with input to related STEM subjects and management of volunteer actions to inspect, record data and where safe to do so, clear sensitive</p>	<p>Through it's ongoing partnership with SFRS, SFF, TCV and currently established local flood groups, the Council will continue it's efforts to raise awareness of flood risk and community resilience.</p>
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					watercourses of debris. Appropriate training for such work has been given to volunteers.	
<b>Emergency plans/response</b> (90320014)	<b>G</b>	See Progress with LPD-wide Actions for general information.	Category 1 and 2 Responders	On-going	Formal Flood Partnership Group established between Clackmannanshire and Stirling Councils, Scottish Fire & Rescue Service, Scottish Flood Forum, Emergency Planning Officer from each Local Authority, Scottish Water as of June 2017. Ongoing dialogue and quarterly meetings between parties to better plan joint emergency responses to community risks.	Continue to develop partnership working model and embed communications links between key group stakeholders and also to expand group membership to other potential partners (e.g. volunteer sector)
<b>Planning Policy</b> (90010001)	<b>G</b>	See Progress with LPD-wide Actions	SEPA and Planning Authorities	On-going	On-going	

## 4.5 Stirling (Cornton and Causewayhead) (Potentially Vulnerable Area 09/05)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Forth



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### Summary of Progress for Cornton and Causewayhead

There are approximately 340 residential properties and 50 non-residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £390,000. [LFRMP under PVA 09/05.](#)

#### Key progress in reducing the impacts of flooding since publication:

Stirling Flood alleviation scheme design is progressing.

Partnership working between Stirling Council and Scottish Fire and Rescue service will ensure improving preparedness and flood response.

3 key locations on priority inspection and clearance schedule

## Overview of actions to manage flooding in Stirling (Cornton and Causewayhead) (Potentially Vulnerable Area 09/05)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/05			G			G	G	G		G			G	G	G		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
New flood warning	G	Flood warning is required for properties at risk of coastal flooding in the Alloa Harbour	SEPA	2017	Flood warning service now operational.	SEPA will continue to operate the flood warning service.



		area for public safety reasons. Delivery of new warnings in this area can potentially be undertaken through an extension to the existing Firth of Forth and Tay flood forecasting system and warning scheme.				
Surface water plan/study (90260019)	G	SR 15 Integrated catchment study for the Stirling drainage catchment to support the SWMP process for Stirling and Bridge of Allan by improving understanding of	Scottish Water	2016-2022	Complete Historical Verification	Complete Catchment Flood Assessment by 2022

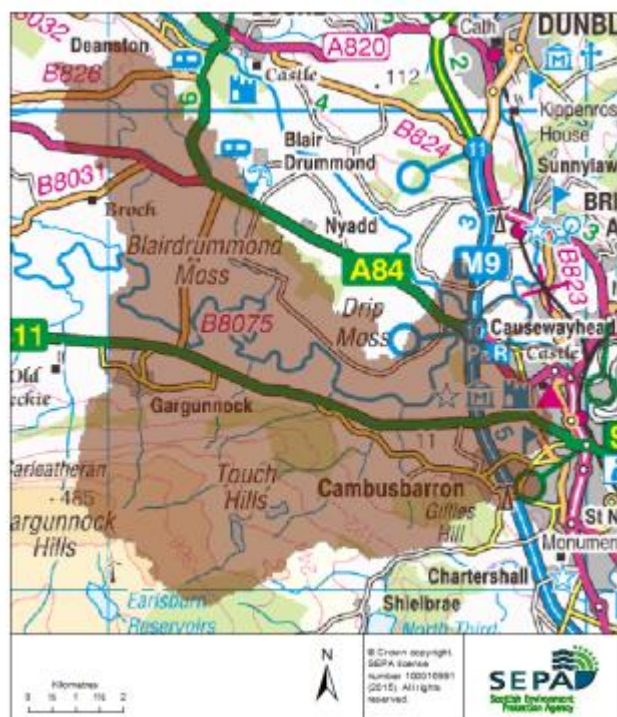
		surface water flood risk and the interaction with other sources of flooding.				
<b>Surface water plan/study</b> (90160018)	<b>G</b>	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	Stirling Council	2018-2022	This study has not yet started but preparatory works have been undertaking digitising historical data in to feed into the study. Study likely to be delivered later than originally projected as the outputs from the integrated catchment study are required to feed into the plan and that study is currently 6 months behind the original projected finish date is still expected to be delivered within the planning cycle.	The progress of the integrated catchment study will be monitored and inform when the surface water management plan will be being and be completed.
<b>Strategic</b>	<b>G</b>	Fluvial mapping	Clackmannan-	2016-	Clackmannanshire Council	Monitor progress of

<b>mapping and modelling</b> (90290016)		developments / further survey work: Brothie Burn area. Led by Clackmannanshire Council in collaboration with SEPA.	shire council and SEPA	2021	await outputs of Brothie Burn culvert mapping and modelling exercise agreed between Council and SEPA to be completed by SEPA. Current estimated completion date given by SEPA as September 2018.	mapping and modelling exercise by SEPA.
<b>Strategic mapping and modelling</b> (90320016)		Coastal mapping developments: Dunbar to Stirling area.	SEPA	2016-2019		<p>A specification for coastal modelling and mapping for the coastline from Arbroath to Berwick Upon Tweed is under development.</p> <p>Opportunities will be sought to align the delivery of this project with any required developments to Flood Warning schemes in the area.</p> <p>It is anticipated that this action will be completed by</p>

						the end of Cycle 1.
<b>Flood forecasting</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	SEPA	On-going	On-going	See Progress with LPD-wide Actions in Table 2.
<b>Self help</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	Individuals	On-going	See Progress with LPD-wide Actions	See Progress with LPD-wide Actions in Table 2.
<b>Awareness raising</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	Responsible Authorities	On-going	See Progress with LPD-wide Actions	See Progress with LPD-wide Actions in Table 2.
<b>Maintenance</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	Local Authority	On-going	On-going	See Progress with LPD-wide Actions
<b>Emergency plans/response</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	Category 1 and 2 responders	On-going	On-going	See Progress with LPD-wide Actions in Table 2.
<b>Planning Policy</b>	<b>G</b>	See Progress with LPD-wide Actions in Table 2.	Planning authorities and SEPA	On-going	On-going	See Progress with LPD-wide Actions

## 4.6 Gargunnock (Potentially Vulnerable Area 09/06)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Forth



### Summary of Progress for Gargunnock

There are approximately 80 residential properties and 30 non-residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £590,000. LFRMP under PVA 09/06.

#### Key progress in reducing the impacts of flooding since publication:

Stirling council have carried out investigation and survey work that was provided to SEPA to allow re-modelling of flood risk specific to the Gargunnock burn. The outcome of this process has resulted in a much lower anticipated flood risk which is more representative of the history of flooding and local knowledge. The council have therefore not prioritised any specific measures in this area but will continue to carry out maintenance and watercourse inspections and review annually.

There are 12 key locations on inspection and clearance regime in this PVA.

Reproduced from Forth Flood Risk Management Strategy, SEPA (December 2015).



**Figure?** Key flood locations trash screen in Cambusbarron prior to upgrade



**Figure?** New trash screen installed along with major pipe upgrade to alleviate flooding

PVA	Flood protections scheme/works	Natural flood management	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/06				G		G	G		G	G			A	A	A		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Flood protection study (90180005)	G	A flood protection study has been recommended to assess the level of flood risk in Gargunnock.	Stirling Council	2017-2020	Stirling council undertook survey and investigation works and provided data to SEPA to enable the Gargunnock burn to be remodelled. The outputs of this exercise have determined the risk to be lower than originally anticipated. The new outputs reflect more accurate representation of local flood risk. A flood	Further information determined study not required. The council will continue to carry out watercourse inspections and maintenance activities as it a more effective

		The area has been identified at risk of flooding by SEPA but no flooding issues were previously identified by Stirling Council. The watercourse should be resurveyed and the model updated in collaboration between SEPA and Stirling Council.			protection study was therefore not required.	use of limited funds and resources. This will continue to be reviewed annually.
Surface water plan/study (90160019)	G	SR 15 Integrated catchment	Scottish Water	2016-2022	Complete Historical Verification	Complete Catchment Flood Assessment by 2022.



		study for the Stirling drainage catchment to support the SWMP process for Stirling and Bridge of Allan by improving understanding of surface water flood risk and the interaction with other sources of flooding.				
<b>Surface water plan/study</b> (90160018)	<b>G</b>	The area must be covered by a surface water management plan or plans that set	Stirling Council	2018-2021	This study has not yet started but preparatory works have been undertaking digitising historical data in to feed into the study. Study likely to be delivered later than originally projected as the outputs from the integrated	The progress of the integrated catchment study will be monitored and inform when the surface water management

		objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. This study covers a small proportion of the Gargunnock catchment in Raploch and Torbrex, not Gargunnock village itself.			catchment study are required to feed into the plan and that study is currently behind the original projected finish date though still expected to be delivered within the planning cycle.	plan will be being and be completed.
<b>Maintain Flood</b>	<b>G</b>	Continue to	SEPA	On-	SEPA has continued to operate the flood	SEPA will continue to

<b>Warning</b> (90180005)		maintain the Callander to Stirling flood warning area which covers the River Teith to the confluence with the River Forth and the Bridgehaugh, Cornton and Raploch flood warning areas which cover the River Forth, all of which are part of the Stirling river flood warning scheme		going	warning service	operate the flood warning service
<b>Strategic</b>	<b>G</b>	Scottish Water	Scottish	2016-	Complete	Complete

mapping and modelling (90320019)		will undertake further investigation and modelling in the Stirling sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.	Water	2021		
Flood forecasting (90320009)	G	See Progress with LPD-wide Actions	SEPA	On-going	On-going	
Self help	A	See Progress	Individuals	On-	No PVA specific activities have been	

(90320011)		with LPD-wide Actions		going		undertaken by the council to facilitate self-help in the Gargunnock PVA.	
<b>Awareness raising</b> (90320013)	A	See Progress with LPD-wide Actions	Stirling Council and SEPA	On-going		No PVA specific activities have been undertaken.	The council plan to have PVA specific engagement in all PVAs from 2019 onwards
<b>Maintenance</b> (90320007)	A	See Progress with LPD-wide Actions	Stirling Council	On-going		Maintenance of critical identified flood risk locations have been undertaken as part of annual works. No other specific works have taken place. Works have been prioritised on the basis of limited budgets.	
<b>Emergency plans/response</b> (90320014)	G	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On-going		On-going	
<b>Planning Policy</b> (90010001)	G	See Progress with LPD-wide Actions	Planning Authority and SEPA	On-going		On-going	

## 4.7 Stirling (Raploch and Riverside) (Potentially Vulnerable Area 09/07)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Forth



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### Summary of Progress for Raploch and Riverside

There are approximately 730 residential properties and 80 non-residential properties at risk of flooding. The Annual Average Damages are approximately £850,000. LFRMP under PVA 09/07. **Key progress in reducing the impacts of flooding since publication:**

Scottish Water are leading an **integrated catchment study** currently underway which will feed into a surface water management plan later in the current plan. This aims to tackle flooding such as the regular flooding in the city centre shown in figure ?



Figure?: Flooding Stirling city center four times in 12 months



## Overview of actions to manage flooding in Raploch and Riverside (Potentially Vulnerable Area 09/07)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/07	R					G	G	G		G			A	A	A		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Flood protection scheme/works (90140006)	<b>R</b>	A flood protection scheme has been proposed for Stirling. The scheme would consist of flood embankments and would provide a 1 in 200 year standard of protection. The scheme has a low benefit-cost ratio, but has been identified as the only option for Stirling. Part of this proposed flood protection scheme is located in PVA 09/05. The benefits and impacts have been assessed for the whole scheme. In accordance	Stirling Council	2019-2021	Background investigations have been undertaken to assess the buildability of the scheme. The design work will continue to progress through the remainder of cycle 1.	Flood alleviation Scheme to be delivered in Cycle 2 and will have to be integrated with the city plans for riverfront redevelopment.



		<p>with the Flood Risk Management Strategy, Stirling Council (and SEPA as the licensing authority) should seek to ensure that the works will not have an adverse effect on the integrity of the River Teith SAC or the Firth of Forth SPA. The proposed flood protection study is located on the Upper Forth Estuary (water body ID 200437). The physical condition of this stretch of estuary is identified by SEPA to be at less than good status. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary</p>				
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		should be considered by coordinating with river basin management planning.				
Surface water plan/study (90160019)	<b>G</b>	SR 15 Integrated catchment study for the Stirling drainage catchment to support the SWMP process for Stirling and Bridge of Allan by improving understanding of surface water flood risk and the interaction with other sources of flooding.	Scottish Water	2016-2022	Complete Historical Verification	Complete Catchment Flood Assessment by 2022
Surface water plan/study (90160018)	<b>G</b>	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the	Stirling Council	2018-2021	This study has not yet started but preparatory works have been undertaking digitising historical data in to feed into the study. Study likely to be delivered later than originally projected as the outputs from the integrated catchment study	The progress of the integrated catchment study will be monitored and inform when the surface water management plan will be being and be completed.

		objectives.			are required to feed into the plan and that study is currently behind the original projected finish date though still expected to be delivered within the planning cycle.	
Strategic mapping and modelling (90320030)	<b>G</b>	Scottish Water will undertake further investigation and modelling in the Cowie, Fallin and Stirling sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.	Scottish Water	2016-2021	Assessment will not deliver within LFRMP timescales but is still on track to deliver within FRM Cycle 1.	Re-scheduled for delivery 2019
Maintain flood warning (90160018)	<b>G</b>	Continue to maintain the Riverside and Cambuskenneth, Bridgehaugh and Raploch	SEPA	On-going	SEPA has continued to operate the flood warning service	SEPA will continue to operate the flood warning service

		flood warning areas (River Forth) (Stirling river flood warning scheme).				
Flood forecasting	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	See Progress with LPD-wide Actions
Self help	<b>A</b>	See Progress with LPD-wide Actions	Individuals	On-going	No PVA specific activities in progress	See Progress with LPD-wide Actions
Awareness raising	<b>A</b>	See Progress with LPD-wide Actions	SEPA and Stirling council	On-going	No PVA specific activities in progress	Stirling councils plans to carry out PVA specific engagement from 2019 onwards.
Maintenance	<b>A</b>	See Progress with LPD-wide Actions	Stirling council	On-going	There are	See Progress with LPD-wide Actions
Emergency plans/response	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On-going	On-going	See Progress with LPD-wide Actions
Planning Policy	<b>G</b>	See Progress with LPD-wide Actions	Planning Authorities and SEPA	On-going	On-going	See Progress with LPD-wide Actions

## 4.8 Stirling ((Broomridge and St Ninians) (Potentially Vulnerable Area 09/08)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Allan Water



### Summary of Progress for Broomridge and St Ninians

There are approximately 80 residential properties, and 30 non-residential properties at risk of flooding. The Annual Average Damages are approximately £680,000. LFRMP under PVA 09/08.

#### Key progress in reducing the impacts of flooding since publication:

Scottish Water are leading an **integrated catchment study** currently underway which will feed into a surface water management plan later in the current plan.

**Maintenance works.** There are 5 key inspection and clearance locations in this PVA. These locations can be difficult to maintain due to fly tipping and garden waste blocking trash screens. See figures ? and ? below showing debris removed from these locations on a regular basis.

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Strategy, SEPA (December 2015).



Figure? Fly-tipping at key flood risk location



Figure? Fly-tipped debris built up at outfall prevents gulleys emptying into the pipes .Results in flooding on roads and footpaths

## Overview of actions to manage flooding in Broomridge and StNinians (Potentially Vulnerable Area 09/08)

PVA	Flood protections	Natural flood management	New flood warning	Flood protection	Natural flood management	Surface water plan/study	Strategic mapping and	Maintain flood protection	Maintain flood warning	Flood forecasting	Property level protection	Community flood action	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/08			G	G		G	G	G		G			A	A	A		A	A

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
<b>Flood protection scheme/works (90140006)</b>	<b>R</b>	A flood protection scheme has been proposed for Stirling. The scheme would consist of flood embankments and would provide a 1 in 200 year standard of protection. The scheme has a low benefit-cost ratio, but has been identified as the only option for Stirling. Part of this proposed flood	Stirling Council	2019-2021	Background investigations have been undertaken to assess the buildability of the scheme. The design work will continue to progress through the remainder of cycle 1.	Flood alleviation Scheme to be delivered in Cycle 2 and will have to be integrated with the Citydeal proposals for riverfront redevelopment.



		<p>protection scheme is located in PVA 09/05. The benefits and impacts have been assessed for the whole scheme. In accordance with the Flood Risk Management Strategy, Stirling Council (and SEPA as the licensing authority) should seek to ensure that the works will not have an adverse effect on the integrity of the River Teith SAC or the Firth of Forth</p>				
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		<p>SPA. The proposed flood protection study is located on the Upper Forth Estuary (water body ID 200437). The physical condition of this stretch of estuary is identified by SEPA to be at less than good status. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary should be considered by</p>				
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		coordinating with river basin management planning.				
Surface water plan/study (90160019)	<b>G</b>	SR 15 Integrated catchment study for the Stirling drainage catchment to support the SWMP process for Stirling and Bridge of Allan by improving understanding of surface water flood risk and the interaction with other sources of flooding.	Scottish Water	2016-2022	Complete Historical Verification	Complete Catchment Flood Assessment by 2022.
Surface water plan/study	<b>G</b>	The area must be covered by a	Stirling Council	2018-2021	This study has not yet started but preparatory works have been	The progress of the integrated catchment study

(90160018)		surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.			undertaking digitising historical data in to feed into the study. Study likely to be delivered later than originally projected as the outputs from the integrated catchment study are required to feed into the plan and that study is currently behind the original projected finish date is still expected to be delivered within the planning cycle.	will be monitored and inform when the surface water management plan will be being and be completed.
Strategic mapping and modelling (90320030)	G	Scottish Water will undertake further investigation and modelling in the Cowie, Fallin and Stirling sewer catchments to improve	Scottish Water	2016-2021	Started but delayed.	Assessment will not deliver within LFRMP timescales but is still on track to deliver within FRM Cycle 1. Re-scheduled for delivery 2019

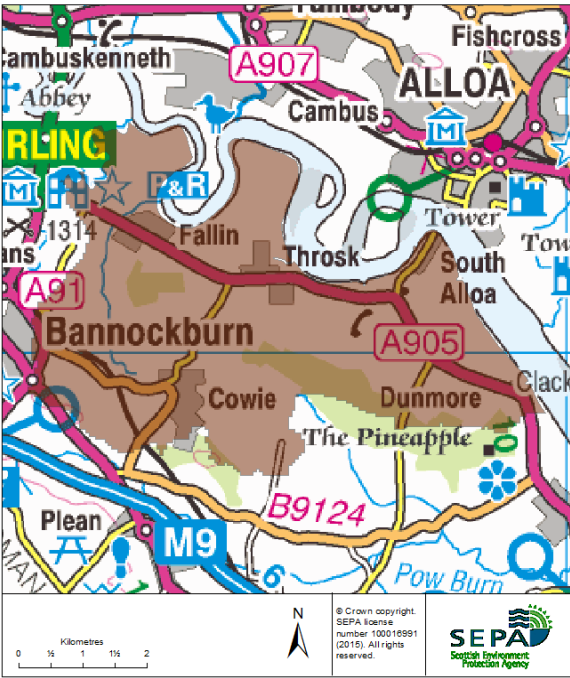
		knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.				
Maintain flood warning (90160018)	G	Continue to maintain the Riverside and Cambuskenneth, Bridgehaugh and Raploch flood warning areas which cover the River Forth and are part of the Stirling river flood warning scheme.	SEPA	On-going	SEPA has continued to operate the flood warning service	SEPA will continue to operate the flood warning service
Flood	G	See Progress	SEPA	On-	On-going	

forecasting (90320009)		with LPD-wide Actions		going		
Self help (90320011)	A	See Progress with LPD-wide Actions	Individuals	On- going	No PVA specific activities in progress	
Awareness raising (90320013)	A	See Progress with LPD-wide Actions	SEPA and Stirling council	On- going	No PVA specific activities in progress	Stirling councils plans to carry out PVA specific engagement from 2019 onwards.
Maintenance (90320007)	A	See Progress with LPD-wide Actions	Stirling council	On- going	Maintenance of critical identified flood risk locations have been undertaken as part of annual works. No other specific works have taken place. Works have been prioritised on the basis of limited budgets.	
Emergency plans/response (90320014)	G	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On- going	On-going	
Planning Policy (90010001)	G	See Progress with LPD-wide Actions	Planning Authorities and SEPA	On- going	On-going	

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4 .9 Stirling (Eastern Villages) (Potentially Vulnerable Area 09/09)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Allan Water



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Summary of Progress for Eastern Villages

There are approximately 20 residential properties and 10 non-residential properties at risk of flooding. The Annual Average Damages are approximately £120,000. £29,000. Further information can be found in LFRMP under PVA 09/09.

Key progress in reducing the impacts of flooding since publication:

The council have carried out maintenance works that comply with the maintenance action in the PVA. There are a number of locations within the PVA that are inspected and cleared on a fortnightly basis. Shown below is a series of photographs of one particular example of a local pipe inlet where significant flooding has previously occurred. A new trash screen has been installed and the location continues to be inspected and cleared fortnightly and additionally when SEPA issue a flood alert for the Central area. There are six inspection and clearance locations in this PVA.



Figure? Trash screen and pipe inlet before upgrade



Figure? Pipe became blocked during heavy rainfall contributing to flooding within a housing estate and a main access road.



Figure? New trash screen installed and maintained by the council fortnightly. No reported flooding since installation completed.

Overview of actions to manage flooding in Eastern Villages (Potentially Vulnerable Area 09/09)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
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09/09							G			G			A	A	A		G	G
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Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Strategic mapping and modelling (90320019)	G	Scottish Water will undertake further investigation and modelling in the Cowie, Fallin and Stirling sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.	Scottish Water	2016-2021	Assessment will not deliver within LFRMP timescales but is still on track to deliver within FRM Cycle 1.	Re-scheduled for delivery 2019
Strategic mapping and modelling (90320016)	G	Coastal mapping developments: Dunbar to Stirling area	SEPA	2016-2021	Following the establishment of a coastal flood hazard map development framework	A technical specification for coastal modelling and mapping for the coastline from Arbroath

					<p>and characterisation of the coastline, several projects are currently underway at this location:</p> <ul style="list-style-type: none"> <li>• Development of a national coastal joint probability dataset;</li> <li>• Update to the UK design extreme sea level dataset;</li> <li>• Collection of topographic survey data of beach profiles and defences.</li> </ul> <p>These projects/datasets will inform future a future coastal modelling and mapping project for the coastline from Arbroath to Berwick Upon Tweed.</p>	<p>to Berwick Upon Tweed is under development. Opportunities will be sought to align the delivery of this project with any required developments to Flood Warning schemes in the area.</p> <p>It is planned that this action will be completed by the end of Cycle 1.</p>
Flood Forecasting	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	See Progress with LPD-wide Actions

(90320009)						
<b>Self help (90320011)</b>	<b>A</b>	See Progress with LPD-wide Actions	Individuals	On-going	On-going  No specific work has been undertaken within the Eastern villages PVA to date.	See Progress with LPD-wide Actions
<b>Awareness raising (90320013)</b>	<b>A</b>	See Progress with LPD-wide Actions	SEPA and Stirling council	On-going	On-going  No specific work has been undertaken within the Eastern villages PVA.	See Progress with LPD-wide Actions
<b>Maintenance (90320007)</b>	<b>A</b>	See Progress with LPD-wide Actions	Stirling council	On-going	Maintenance of critical identified flood risk locations have been undertaken as part of annual works. No other specific works have taken place. Works have been prioritised on the basis of limited budgets. There are six inspection and	See Progress with LPD-wide Actions

					clearance locations in this PVA.	
<b>Emergency plans/response (90320014)</b>	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On-going	On-going	See Progress with LPD-wide Actions
<b>Planning Policy (90010001)</b>	<b>G</b>	See Progress with LPD-wide Actions	Planning Authorities and SEPA	On-going	On-going	See Progress with LPD-wide Actions

## Cambus, Alloa and Sauchie (Potentially Vulnerable Area 09/10)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Allan Water



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### Summary of Progress for Cambus, Alloa and Sauchie

There are fewer than 10 residential properties and approximately 10 non-residential properties at risk of flooding. The Annual Average Damages are approximately £96,000. Further information can be found in LFRMP under PVA 09/10.

#### Key progress in reducing the impacts of flooding since publication:

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### Overview of actions to manage flooding in Cambus, Alloa and Sauchie (Potentially Vulnerable Area 09/03)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/10					G	G	G			G			G	G	G		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Surface water plan/study (90260019)	G	SR 15 Integrated catchment study for the Alloa and wider drainage catchment to	Scottish Water and Clackmannashire council	2018-2020	Study stopped at scoping stage. Scoping stage highlighted limited to no interaction between sewers and watercourses so all	Study complete output claimed

		support the SWMP process for Alloa, Alva, Menstrie, Tillicoultry, Coalsnaughton and Devonside by improving understanding of surface water flood risk and the interaction with other sources of flooding.			parties agreed to terminate ICS	
Surface water plan/study (90160018)	G	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water	Clackmannan-shire council	2018-2021		

		flood risk and identify the most sustainable actions to achieve the objectives.				
<b>Strategic mapping and modelling</b> (90290016)	<b>G</b>	Fluvial mapping developments / further survey work: Brothie Burn area. Led by Clackmannanshire Council in collaboration with SEPA.	Clackmannanshire council and SEPA		<p><b>Clackmannanshire Council</b> await outputs of Brothie Burn culvert mapping and modelling exercise agreed between Council and SEPA to be completed by SEPA. Current estimated completion date given by SEPA as September 2018.</p> <p><b>SEPA.</b> Following a screening exercise to characterise the Brothie Burn catchment and identify the data necessary to support mapping improvements, a topographic survey of the catchment has</p>	<p>Monitor progress of mapping and modelling exercise by SEPA</p> <p>It is planned to complete this action by the end of 2018</p>



					been undertaken. A modelling project is currently underway which will enable a revision of the river flood hazard mapping in this area.	
<b>Strategic mapping and modelling</b> (90320016)	<b>G</b>	Coastal mapping developments: Dunbar to Stirling area.	SEPA	2016-2021	<p>Following the establishment of a coastal flood hazard map development framework and characterisation of the coastline, several projects are currently underway at this location:</p> <ul style="list-style-type: none"> <li>• Development of a national coastal joint probability dataset;</li> <li>• Update to the UK design extreme sea level dataset;</li> <li>• Collection of topographic survey data of beach profiles and defences.</li> </ul>	<p>A technical specification for coastal modelling and mapping for the coastline from Arbroath to Berwick Upon Tweed is under development.</p> <p>Opportunities will be sought to align the delivery of this project with any required developments to Flood Warning schemes in the area.</p> <p>It is planned that this action will be completed by the end of Cycle 1..</p>

					These projects/datasets will inform future a future coastal modelling and mapping project for the coastline from Arbroath to Berwick Upon Tweed.	
<b>Strategic mapping and modelling</b> (90320019)	<b>G</b>	Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.	Scottish Water	2016-2021	Complete	Complete
<b>New Flood Warning</b> (90320010)	<b>G</b>	Flood warning is required for properties at risk of coastal flooding	SEPA	2017	Flood warning service now operational	SEPA will continue to operate the flood warning service

		in the Alloa Harbour area for public safety reasons. Delivery of new warnings in this area can potentially be undertaken through an extension to the existing Firth of Forth and Tay flood forecasting system and warning scheme.				
<b>Flood Forecasting</b> (90320009)	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	See Progress with LPD-wide Actions
<b>Self help</b> (90320011)	<b>G</b>	See Progress with LPD-wide Actions	Individuals	On-going	On-going	See Progress with LPD-wide Actions
<b>Awareness raising</b>	<b>G</b>	See Progress with LPD-wide Actions	SEPA and Stirling council	On-going	On-going	See Progress with LPD-wide Actions

(90320013)						
<b>Maintenance</b> (90320007)	<b>G</b>	See Progress with LPD-wide Actions	Stirling council	On-going	On-going	See Progress with LPD-wide Actions
<b>Emergency plans/response</b> (90320014)	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On-going	On-going	See Progress with LPD-wide Actions
<b>Planning Policy</b> (90010001)	<b>G</b>	See Progress with LPD-wide Actions	Planning Authorities and SEPA	On-going	On-going	See Progress with LPD-wide Actions

## Clackmannan and Forestmill (Potentially Vulnerable Area 09/11)

Local Plan District	Local authority	Main catchment
Forth	Stirling Council	Devon



### Summary of Progress for Clackmannan and Forestmill

There are fewer than 10 residential properties and approximately 10 non-residential properties at risk of flooding. The Annual Average Damages are approximately £96,000. Further information can be found in [LFRMP under PVA 09/11..](#)

#### Key progress in reducing the impacts of flooding since publication:

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## Overview of actions to manage flooding in Clackmannan and Forestmill (Potentially Vulnerable Area 09)

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/11							G			G			G	G	G		G	G

Action	Status	Description	Delivery Lead	Plan Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Strategic mapping and modelling (90320019)		Further assessment of flood risk in Alloa sewer catchment.	Scottish Water	2016 - 2021	The Scottish Water assessment of flood risk within the sewer catchment has been completed. The assessment helps to improve knowledge and understanding of surface water flood risk	Complete

<b>Flood Forecasting</b> (90320009)	<b>G</b>	See Progress with LPD-wide Actions	SEPA	On-going	On-going	See Progress with LPD-wide Actions
<b>Self help</b> (90320011)	<b>G</b>	See Progress with LPD-wide Actions	Individuals	On-going	On-going	See Progress with LPD-wide Actions
<b>Awareness raising</b> (90320013)	<b>G</b>	See Progress with LPD-wide Actions	SEPA and Stirling council	On-going	On-going	See Progress with LPD-wide Actions
<b>Maintenance</b> (90320007)	<b>G</b>	See Progress with LPD-wide Actions	Stirling council	On-going	On-going	See Progress with LPD-wide Actions
<b>Emergency plans/response</b> (90320014)	<b>G</b>	See Progress with LPD-wide Actions	Category 1 and 2 Responders	On-going	On-going	See Progress with LPD-wide Actions
<b>Planning Policy</b> (90010001)	<b>G</b>	See Progress with LPD-wide Actions	Planning Authorities and SEPA	On-going	On-going	See Progress with LPD-wide Actions

## Blackford (Potentially Vulnerable Area 09/12c)

Local Plan District	Local authority	Main catchment
Forth	Perth and Kinross Council	Allan Water



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### Summary of Progress for Blackford

There are approximately 50 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £270,000. Further information can be found in the Forth LFRMP PVA 9/12c

There have been no significant weather events in this PVA since the publication of the Forth Local FRM Plan.

#### Key progress in reducing the impacts of flooding since publication:

- A **Flood Protection Study** commenced in November 2018, with completion expected in the 2019/20 financial year. This study will assess the flood risk to Blackford and, where feasible, propose suitable measures to reduce the identified risk.
- **Awareness Raising** activities will be carried out in conjunction with this study.
- Perth and Kinross Council supports communities to become more resilient to flooding. The Council has **developed its website** to provide more advice and information on flood risk management. The **Blackford Community Resilience Group** has also been established.
- The Council will also continue to carry out its other general actions to manage flood



risk, including **inspections and any necessary maintenance of the watercourses** in the PVA.

### Overview of actions to manage flooding in Blackford Area 09/12c)

PVA	Flood protections	Natural flood management	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection	Maintain flood warning	Flood forecasting	Property level protection	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
09/12c				G						G			G	G	G		G	G

Action	Status	Description	Delivery Lead	Planned Dates	Progress in Delivery, including key deliverables and dates	Revised dates and planned actions to complete / address delay
Flood protection study (90310005)	G	A flood protection study has been recommended for Blackford to assess	Perth and Kinross Council	2016-2021	The Blackford Flood Study commenced on schedule in November 2018. The contract was awarded to consulting	Perth and Kinross Council will liaise with Stantec to finalise the flood study. The study

		<p>whether flood defences, modification of conveyance, sediment management and natural flood management could reduce flood risk. The study will also investigate the viability of property level protection. Natural flood management options that will be considered including runoff control and sediment management.</p>			<p>engineers, Stantec. The flood study is currently on programme for completion in the 2019/20 financial year.</p>	<p>findings will be disseminated to the local community via drop in sessions in the 2019/20 financial year.</p>
Flood forecasting (90320009)	<b>G</b>	See Description within LPD-wide	SEPA	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2

		Actions in Table 2				
<b>Self help (90320011)</b>	<b>G</b>	See Description within LPD-wide Actions in Table 2	-	Ongoing	Perth and Kinross Council supports communities to become more resilient to emergency situations, including flood events. Communities have been engaged through the multi-agency Local Resilience Partnership Community and Business Resilience Group, led by the Council. The Blackford Community Resilience Group has been established in this area and the community hall is now available as an emergency rest centre.	Perth and Kinross Council will continue to support communities to become more resilient to flooding. The Council will also continue to support communities to develop community resilience groups and emergency plans.
<b>Awareness raising (90320013)</b>	<b>G</b>	SEPA and the responsible authorities have a duty to raise public	Responsible Authorities	Ongoing	See Progress with LPD-wide Actions in Table 2.	Awareness raising activity will be carried out in conjunction with the Blackford Flood

		awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.				Study (Action ID 90310005) which commenced in November 2018.
<b>Maintenance (90320007)</b>	<b>G</b>	See Description within LPD-wide Actions in Table 2	Perth and Kinross Council, Land/Asset managers	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2
<b>Emergency plans/response (90320014)</b>	<b>G</b>	See Description within LPD-wide Actions in Table 2	Category 1 and 2 Responders	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2
<b>Planning Policy (90010001)</b>	<b>G</b>	See Progress within LPD-wide Actions	Planning Authority	Ongoing	See Progress with LPD-wide Actions in Table 2	See planned actions in Table 2

## Other actions

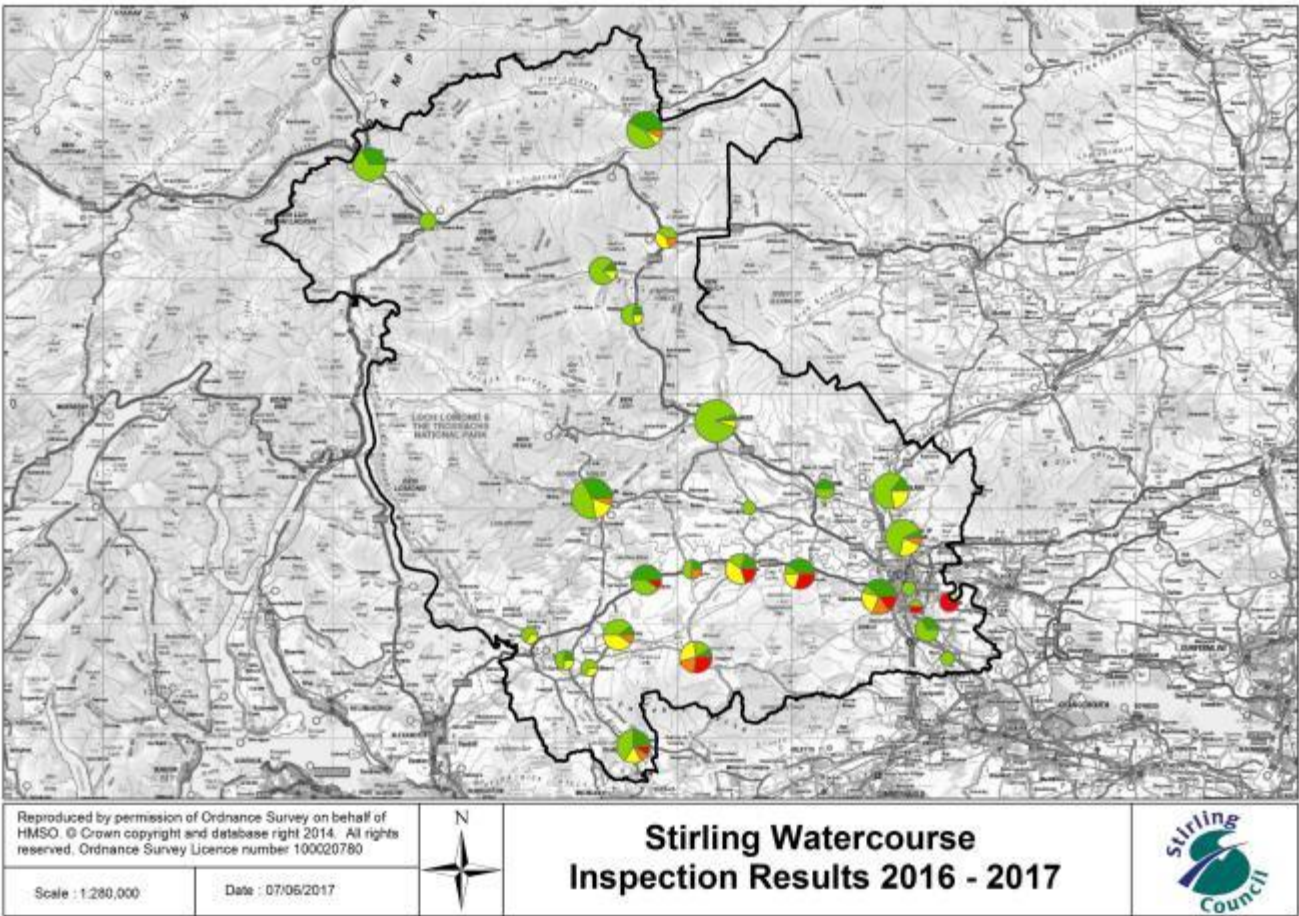
This section sets out details of additional significant actions undertaken in the LPD by local authorities to contribute to the implementation of the current actions in the plan and the achievement of the objectives in the plan.

### SEPA

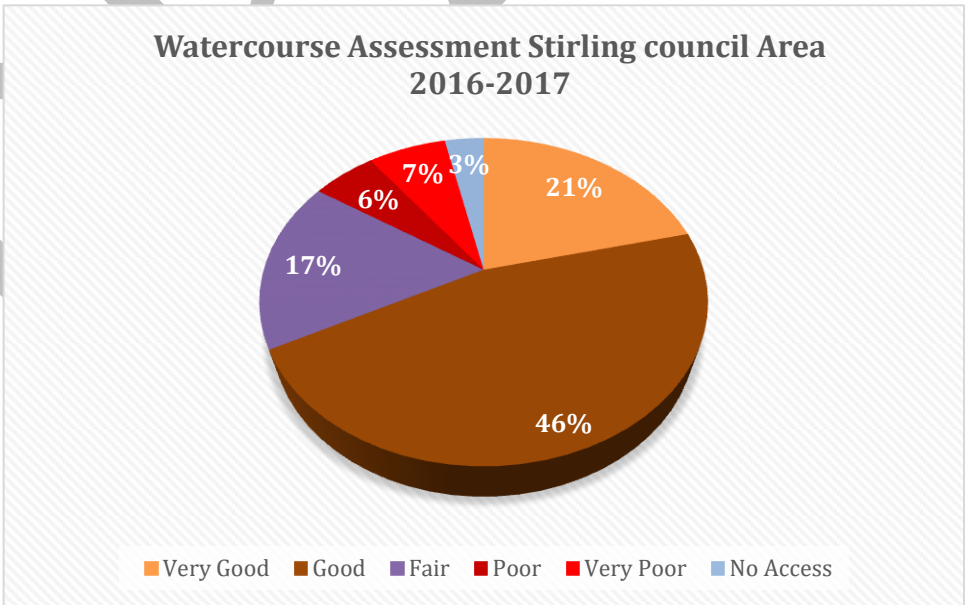
The Strathard NFM study has moved into implementation phase. The project has recently seen leaky woody debris dams installed in one of Duchray sub-catchments with a design that incorporates benefits for ecology and hydromorphology in addition to slowing down the river flow. In this study demonstration catchment (Allt Glas), water level recorders are in operation and have been recording data for nearly one year, as well as, time lapse cameras and a weather station. The data is being collated and analysed locally by our partner organisations Forestry Commission Scotland and Forestry Research.

### Stirling Council

**Watercourse inspections.** Stirling council have been refining a method of undertake risk based watercourse inspections with higher risk areas being inspected annually, and others areas on a less frequent schedule dependent on identified risk. Watercourses have been divided into sections that are individually inspected and a quality score attributed to each section dependent upon how many problems have been identified that could contribute to flood risk. Where a severe and immediate risk is identified the council undertake maintenance works or notify the landowner where ownership is private. This process has allowed the council to better prioritise maintenance works on the clearance and repair schedule and to identify where other action can be undertaken. Shown below are results of the inspections for 2016-17 and 2017 -18. These results are broken down by area and severity. This work is critical to allow the council to prioritise and plan works in advance.



Figure? Watercourse Inspections results 2016/17 by area



Figure? Watercourse Inspections results 2016/17 whole council area

Insert 2017/18 inspection map for comparison

**River level monitoring** Stirling Council have a network of river monitoring equipment used primarily for council operational use but access is provided to the public via the council website to allow groups and individuals to be more resilient. There are now a total of 15 gauges and 6 cameras located throughout the council area. New equipment since publication of the plan includes 2 new monitors to facilitate Strathyre resilience group take preparatory steps outlined in their resilience plan. This Village does not reside within a PVA but has a number of properties at risk of flooding. These gauges were installed in 2017 and help achieve actions to raise awareness and to promote self help. A new monitor has also been installed in Strathblane in 2018, this area sits within the Clyde and Loch Lomond local flood risk management plan district but within Stirling council boundary. Five new cameras have also been installed in locations of significant flood risk with the intention of streaming these on the council website to promote awareness and self-help alongside the live river level information.

### Clackmannanshire Council

**Study assessing woodland planting and flood impacts.** A partnership was established in 2014 between Clackmannanshire Council, a landowner agent (Tilhill) and Heriot Watt University to carry out a PHd study of the Menstrie Burn catchment (Jerah). This followed in put by the partners during the woodland planting license by the Forestry Commission. The study is to review cultivation and planting techniques used for the woodland and associated flood impacts during this period and thereafter. Martina Egedusevic is the PHd student for the study and Lyndsay Beevers is the Associate Professor overseeing the PHd. The study is to complete during 2019.



## Appendix 1:

### Flood risk management responsibilities in Scotland and the legal requirement for the publication of this INTERIM REPORT

#### Flood risk management in Scotland

The Scottish Ministers, SEPA and responsible authorities must exercise their flood risk related functions with a view to reducing overall flood risk (reference Section 1(1) of the Flood Risk Management (Scotland) Act 2009).

Through the preparation of a national flood risk assessment and setting of objectives to reduce the level of flood risk by SEPA, which is published in Flood Risk Management Strategy, and the publication of Local Flood Risk Management Plan's by 'lead' local authorities, which detail how and when the actions agreed to meet these objectives are to be done, SEPA and all responsible authorities must act to manage flood risk in a sustainable way.

Flood Risk Management Strategy for Forth  
Local Flood Risk Management Plan for Forth

#### Legal requirement

This document sets out the conclusions of the review of the Local Flood Risk Management Plan (LFRMP) for the Forth (FORTH) Local Plan District (LPD) as required by Section 37 of the Flood Risk Management (Scotland) Act 2009 (the "Act").

#### **37 Local flood risk management plans: interim report**

(1) Not earlier than 2 years and not later than 3 years after a local flood risk management plan is finalised, the lead authority must —

- (a) Review the plan, and
- (b) Publish a report on the conclusions of the review including information on the progress that has been made towards implementing the measures identified in the implementation part of the plan.

(2) The lead authority must make copies of the report available for public inspection.



The FORTH LFRMP, which includes the 'implementation part of the plan', was published in June 2016. The Interim Report is therefore to be published between July 2018 and June 2019. The Interim Report will provide a summary of the LFRMP actions ('measures') and the proposed delivery timescales.

The information on progress will include:

- an assessment of the progress towards implementing each of the actions;
- reasons for any actions where delivery is not as planned; and
- A description of arrangements planned to deliver the remaining actions and to address delayed actions.

The Interim Report is published by the 'lead authority' as defined by Section 34(9) of the Act in partnership with SEPA and the 'responsible authorities', as defined by Section 5 of the Act, will be in the LPD. The approval of the Interim Report will be in accordance with the agreed governance arrangements in the LPD. The responsible authorities for the FORTH LPD are:

- Stirling Council (lead authority)
- Clackmannanshire Council
- Perth and Kinross Council
- Fife Council
- Falkirk Council
- Scottish Water.
- Forestry Commission Scotland
- Loch Lomond and the Trossachs National Park

The lead authority must also publish a Final Report on the LFRMP under Section 38 of the Act between July 2021 and June 2022 (not earlier than 5 years and not later than 6 years from the publication of the plan). The Final Report will provide an assessment of current actions and a summary of current actions not implemented, with reasons for their non-implementation. The Final Report will also include a description of any other measures

implemented, which the lead authority considers have contributed to the achievement of the objectives summarised in the LFRMP.

## Publication

The published Interim Report for the FORTH LFRMP will be made available for public inspection, as per Section 37(2) of the Act, via the website of the lead authority, Stirling Council.

Links to the published Interim Report for the FORTH LFRMP will also be provided from Scottish Government, SEPA and other responsible authority websites.

A hard (paper) copy of the published Interim Report for the FORTH LFRMP is also available for public inspection on weekdays between 9am and 5pm at the following location(s):

- Stirling Council, Endrick House, Kerse Road, Stirling FK7 7SZ
- Clackmannanshire council, Kilncraigs, Greenside Street, Alloa, FK10 1EB
- Perth and Kinross Council, Pullar House, 35 Kinnoull Street, Perth, PH1 5GD
- Perth and Kinross Council Auchterarder Library, Chapel Wynd, Auchterarder PH3 1BL

Copies of the published Interim Report for the FORTH LFRMP may also be available at offices of other responsible authorities. It is advised that the responsible authority be contacted to make such arrangements.

Detailed arrangements for publication of the Interim Report for FORTH LFRMP are in Appendix 2.

## Appendix 2: Publication details

**Publication date: 1 March 2019**

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## Appendix 3: Communications Strategy

### **Flood Risk Management (Scotland) Act 2009 Publication of Interim Report for the Forth Local Flood Risk Management Plan – Summary of Proposed Communications Activities**

The following communications activities will be used to publicize and make the interim report available:

- Upon finalising the Interim Report for the Forth Local FRM Plan, Sections 37(2), 53 and 54 of the Flood Act also specifically require Stirling Council, as the lead authority, to
  - Publish an Interim Report on the Forth Local FRM Plan;
  - Make copies of the Interim Report available for public inspection free of charge and at all reasonable times;
  - Publicize the arrangements for making it available by means of a notice in the appropriate newspapers (at least one Scottish newspaper and such local newspapers within the LPD as considered appropriate)
- The Interim Report for the Forth Local FRM Plan will be published in a hard copy format and a pdf version will also be made available on the Council's website at [Stirling Council flood risk management](#)
- Hard copies of the Interim Report for the Forth Local FRM Plan will be held and made available upon request within Stirling, Clackmannanshire and Perth and Kinross's Council's Perth and relevant Area offices (in Stirling, Alloa, Perth and Auchterarder) in a similar process to the public viewing of planning applications.
- A letter (and electronic version of the report) will be sent to SEPA and the Scottish Ministers.
- On or before the publication date [*to be advised*], public notices will be placed in the *Scotsman*, *the Courier* and *Stirling Observer* fulfilling our duties to publicize the Interim Report in accordance with Sections 37, 53 and 54 of the 2009 Act.
- In June 2016, information was issued to each community council that falls within a PVA to notify them of the publication of the Forth Local FRM Plan and how to access it both electronically and in hard copy. We will send these community councils a further letter to update and inform them of the publication of the Interim Report.
- Subject to the agreement of the Forth LPD Partnership, a draft of the Interim Report will be uploaded to the [Council's website](#). This web page will also be updated to give further information about the publication of the Interim Report. There is also a link to the SEPA Strategies from the Council's webpage.
- Announcements will be posted on social media (the Stirling Council Facebook and Twitter pages).

- Articles have previously been placed in local newspapers for people who live and work in the area.
- An e-mail will be sent to any Local resilience groups within a PVA.
- Information will be placed in any other publications which are considered appropriate (community magazines for instance).

As the lead authority for the Forth LPD, we would suggest that the other local authorities within the Forth LPD Partnership undertake the following minimum activities in order to coordinate communications across the Forth LPD as follows:

- Write to the relevant Community Councils within the PVAs in their local authority area to alert them to the publication of the Interim Report and advise them how to access it. They can then disseminate this information to their members and potentially other local groups that the Council may not have contact with.
- Update Council webpages to provide an update on the Flood act and a link to the Forth Local FRM Plan and SEPA strategies.
- Social media announcements. Each local authority will be able to share/like/retweet each other's social media posts to increase the audience reached.

SEPA, the Loch Lomond & The Trossachs National Park, C, Forestry Commission Scotland and Scottish Water are also invited to advertise the publication of the Interim Report on their websites and via social media.

Any further communications activities are then at the discretion of each individual responsible authority based on their individual Communications and / or Consultation policies and procedures.

## Appendix 4 Scotland Counts Project Report

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