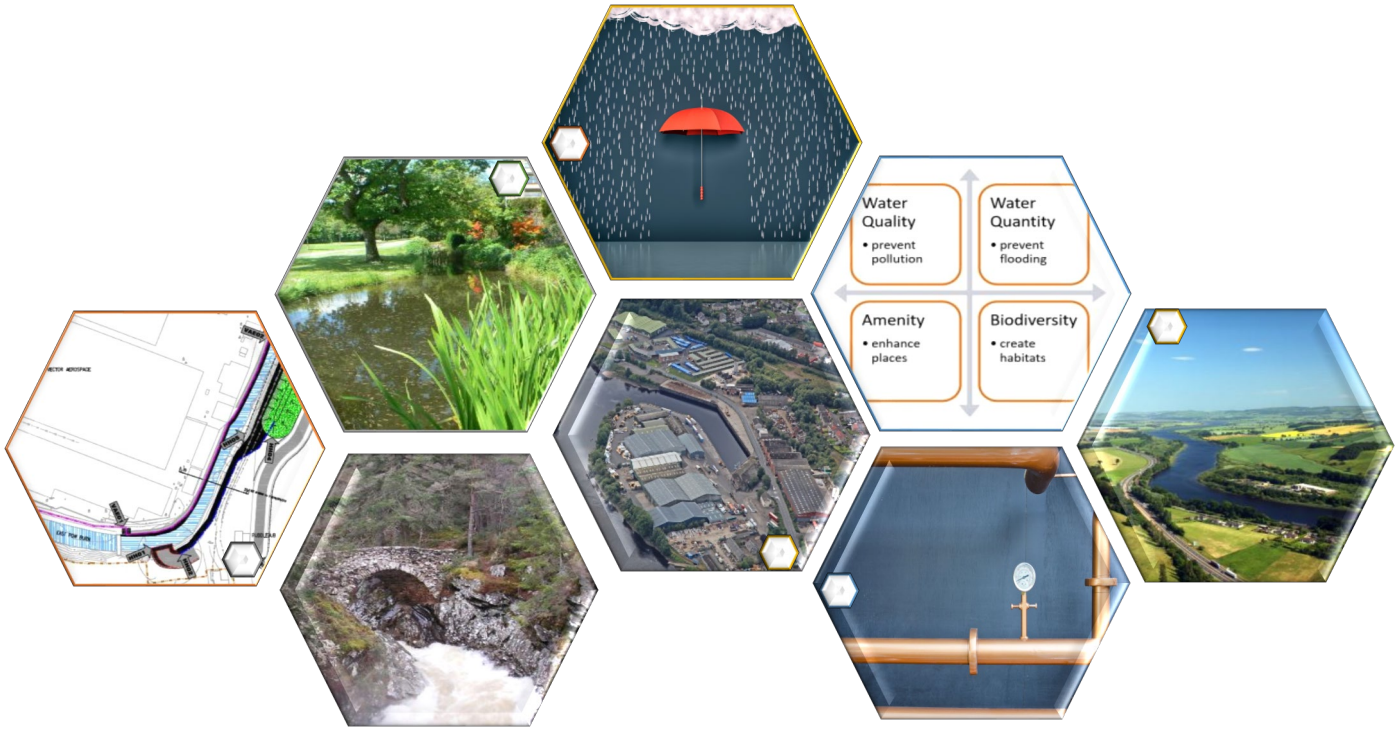
Perth and Kinross LDP3 2027 - Evidence Report

TOPIC PAPER NO. 023: FLOOD RISK AND WATER ENVIRONMENT

July 2024



PERTH & KINROSS COUNCIL

1 Introduction

1.1 This topic paper sets out the key information relating to Flood Risk which will be covered by the Perth and Kinross Local Development Plan (LDP) 3, as required under the provisions of Section 16B Act [1]. It will, alongside a range of other topic papers, contribute towards the preparation of the Council's Evidence Report, which is programmed to be submitted to the Scottish Government's Planning and Environmental Appeals Division during November 2024 for the 'Gatecheck' process.

1.2 The purpose of an Evidence Report is to provide the local authority's interpretation of the evidence it has gathered and the likely implications of that evidence for the preparation of the LDP. The Report will provide a summary of what the evidence means for the plan, rather than contain all the detail of evidence collected.

1.3 In line with the requirements of the Act, this paper will provide important background information for the Plan area regarding the:

- principal environmental characteristics of the district,

and Regulations 9, have regard to:

- any river basin management plan,
- any flood risk management plan; and
- any local flood risk management plan
- any other flood risk management projects that support or align with the above noted bullets.

Relevant Policies

1.4 This topic is covered by the following policies in National Planning Framework 4: policy 22 Flood risk and water management.

1.5 Other relevant policies which overlap with this topic include:

- Policy 2 Climate mitigation and adaptation
- Policy 3 Biodiversity
- Policy 10 Coastal Development
- Policy 20 Blue and Green Infrastructure

Legal and National Policy Requirements / Expectations

1.6 In line with the requirement of the Act, this paper will provide important background information for the Plan area regarding:

• the probability of flooding from all sources with specific regard to Flood Risk Management Plans and River Basin Management Plans

1.7 Under these policies the National Planning Framework 4 (NPF4) expects LDPs to:

• strengthen community resilience to the current and future impacts of climate change, by avoiding development in areas at flood risk as a

[1] The Town and Country Planning (Scotland) Act 1997, as amended by the Planning (Scotland) Act 2019

first principle

• identify the need to bring previously used sites in built up areas into positive use

• identify opportunities to implement improvements to the water environment through natural flood risk management and blue green infrastructure

• take into account the probability of flooding from all sources and make use of relevant flood risk and river basin management plans for the area

• take a precautionary approach regarding the calculated probability of flooding as it is a best estimate, not a precise forecast

• and in areas where climate change is likely to result in increased flood exposure that becomes unmanageable, consideration should be given to alternative sustainable land use or deallocation

1.8 This topic is closely aligned to:
Topic 5: Biodiversity and Natural Places particularly with reference to Nature Networks and
Topic 21: Blue and Green Infrastructure

Perth and Kinross Council Corporate Plan 2022-2027

1.9 The Flood risk and water management topic paper links to the following priorities from the Corporate Plan: Stronger and greener economy, Tackling climate change, and Physical and mental wellbeing. There is a particular need to consider how the LDP can contribute to the following key action, from the Tackling climate change priority:

- To adapt to and mitigate the impact of climate change on the way we operate

1.10 It is important that we lead by example, embedding a climate aware approach into every part of our work, minimising the impact we have and planning for a sustainable future.

2 Information analysis on Flood Risk and water management

List of data sets, sources, and how they are relevant

This section sets out the evidence which is needed so that the Proposed Plan can address the issues raised in the Act and in NPF4.

2.1 **Draft Strategic Flood Risk Assessment** July 2024 (appendix 1 of this document) is designed to inform the development planning process, primarily to avoid increasing overall flood risk by avoiding areas of flood hazard. This is prepared by the planning authority in consultation with Scottish Environment Protection Agency (SEPA). The draft SFRA is provided as appendix 1 to this topic paper. It will be finalised after taking onboard feedback from this consultation.

2.2 SEPA medium likelihood future flood risk 2080 river flood risk mapping is the best proxy for the at-risk flood risk areas mentioned in NPF4, this is currently based on UK 2009 Climate projections but will be updated to reflect the UK 2018 climate change projections. If this updated climate change mapping is available this will be used in site assessment for the Proposed Plan. Should the Proposed Plan promote sites where a potential flood risk is identified on part of the site, then it will be necessary to assess them using the allowances to calculate the area "at risk of flooding or in a flood risk area" and this will clarify the developable area. Whether this happens prior to allocation in the Proposed Plan or is a requirement of the Proposed Plan for the planning application stage, needs further consideration, and feedback is sought. Perhaps if it is the later, a site specific developer requirement for an FRA could be identified in the Proposed Plan, and LDP3 allocation mapping could indicate areas that are unlikely to be developable (subject to FRA defining at risk areas).

2.3 SEPA medium likelihood future flood risk 2080 coastal flood risk mapping is the best proxy for the at-risk flood risk areas mentioned in NPF4, this is currently based on UK 2009 Climate projections but will be updated to reflect the UK 2018 climate change projections. If this updated climate change mapping is available this will be used in site assessment for the Proposed Plan. Should the Proposed Plan promote sites where a potential flood risk is identified on part of the site, then it will be necessary to assess them using the allowances to calculate the area "at risk of flooding or in a flood risk area" and this will clarify the developable area. Whether this happens prior to allocation in the Proposed Plan or is a requirement of the Proposed Plan for the planning application stage, needs further consideration, and feedback is welcomed. Perhaps if it is the later, a site specific developer requirement for an FRA could be identified in the Proposed Plan, and allocation mapping could indicate areas that are unlikely to be developable (subject to FRA defining at risk areas).

2.4 SEPA low likelihood (present day) surface water flood risk mapping when future surface water flood map layer is available (expected by Spring 2025 latest), this will be used instead. However, the surface water present day low likelihood flood map layer, available in the Flood Map Viewer, is the best proxy in the meantime. This layer used the medium likelihood flood event with an increase in rainfall intensity

of 20% nationally. This layer may provide a first indication of those areas potentially at risk from surface water flooding in the future, however due to projected changes in rainfall intensity it may not show all locations that may be affected in the future.

2.5 Planning Information Note 4 (PIN4) SEPA position on development protected by a flood protection scheme (July 2018) supports interpretation of NPF4 policy 22 Flood risk and water management. However, it is noted that this note is being updated to reflect NPF4. This note/its replacement will be referred to when undertaking site assessments for the Proposed Plan. This document clearly articulates the SEPA position regarding development behind existing formal flood defences, and how informal defences should be accounted for.

2.6 SEPA Flood Risk and Land Use Vulnerability Guidance (July 2018) supports interpretation of NPF4 policy 22 Flood risk and water management. However, it is noted that this note is being updated to reflect NPF4. This note or its replacement will be referred to when undertaking site assessments for the Proposed Plan.

2.7 Strategic Environmental Assessment: Development Plan Site Assessment prepared jointly by Historic Environment Scotland, Nature Scot and Scottish Environment Protection Agency provides a template for site assessment which will be used at Proposed Plan stage.

2.8 Tay Flood Risk Management Plan (December 2021) which is prepared by SEPA produced with the support and collaboration of the relevant local authorities. Land use planning objectives and actions have been agreed with responsible authorities, which will ensure flood risk is adequately considered in local planning decisions, and the Proposed plan will support their implementation.

2.9 Forth Flood Risk Management Plan (December 2021) which is prepared by SEPA produced with the support and collaboration of the relevant local authorities. Land use planning objectives and actions have been agreed with responsible authorities, which will ensure flood risk is adequately considered in local planning decisions, and the Proposed plan will support their implementation.

2.10 Forth Estuary Flood Risk Management Plan (December 2021) which is prepared by SEPA produced with the support and collaboration of the relevant local authorities. Land use planning objectives and actions have been agreed with responsible authorities, which will ensure flood risk is adequately considered in local planning decisions, and the Proposed plan will support their implementation.

2.11 Tay Estuary and Montrose Basin Flood Risk Management Plan (December 2021) which is prepared by SEPA produced with the support and collaboration of the relevant local authorities. Land use planning objectives and actions have been agreed with responsible authorities, which will ensure flood risk is adequately considered in local planning decisions, and the Proposed plan will support their implementation.

2.12 Tay Local Flood Risk Management Plan (December 2022) published by Perth and Kinross Council this sets out in more detail how the actions

of the Tay Flood Risk management plan will be achieved. A **Surface water management plan** is currently being prepared for several communities. Scottish Water and Perth & Kinross Council are working in partnership on the outputs from the Perth Integrated Catchment Study (ICS), and Perth & Kinross Council are engaging consulting engineers to complete the flood study and to develop the Perth Surface Water Management Plan. The Proposed plan will support its implementation.

2.13 Forth Local Flood Risk Management Plan (December 2022) which Perth and Kinross Council contributed to the preparation of. This sets out in more detail how the actions of the Forth Flood Risk management plan will be achieved. The Proposed plan will support its implementation.

2.14 Forth Estuary Local Flood Risk Management Plan (December 2022) which Perth and Kinross Council contributed to the preparation of. This sets out in more detail how the actions of the Forth Estuary Flood Risk Management Plan will be achieved. The Proposed plan will support its implementation.

2.15 Tay Estuary and Montrose Basin Flood Risk Management Plan (Interim issue May 2019) which Perth and Kinross Council contributed to the preparation of. This sets out in more detail how the actions of the Tay Estuary Flood Risk management plan will be achieved. The Proposed plan will support its implementation.

2.16 Dynamic Coast webmaps (2021) provides a broad planning tool and makes necessary assumptions about our future climate and management action. This information will be used to inform site selection, and settlement summary text in the Proposed Plan. This is discussed in greater detail in topic paper 11 Coastal Development and Aquaculture.

2.17 Coastal Change Adaptation Guidance supports Local Authorities to develop their Coastal Change Adaption Plans (CCAP). PKC received funds for a Coastal Change Adaption Plan, to enable its production and if available in time it will inform the Proposed Plan. This is discussed in greater detail in topic paper 11 Coastal Development and Aquaculture.

2.18 Climate Change Risk and Opportunity Assessment (August 2023) is a risk and opportunities register, in response to the increasing risks and impacts of current and future climate change considering risks to the organisation and area. The Proposed Plan will support delivery of the Flood Protection measures identified. Climate Change Master Action Plan (August 2023) has an adaptation plan that is integrated with our mitigation plan. This can be viewed under the “Climate Resilience” Delivery Theme. The Proposed Plan will support Natural Flood Risk Management and Flood Protection measures identified to assist with the delivery of this Action Plan.

2.19 River basin management plans for Scotland (December 2021) set out a framework for protecting and improving the water environment and consequentially the benefits provided by the water environment across

Scotland. It focuses on reducing resource use, eliminating waste and restoring natural capital. It covers rivers, lochs, transitional waters (estuaries), coastal waters, groundwater, and groundwater dependant wetlands, and sets out actions for public bodies, industry, and land managers in Scotland. Information on the current status of a water body, pressures affecting it, measures required to address those pressures, and deadlines for achieving those measures will be extracted from the SEPA's water environment hub. The Strategic Environmental Assessment site assessment which will be used at Proposed Plan stage to consider potential allocations considers flood risk, and water environment, with reference to the RBMP.

2.20 Mapping flood disadvantage in Scotland 2015 is most relevant to Flood Risk Management Planning. Nearly all of the acutely and extremely socially vulnerable and flood-disadvantaged data zones were located within PVAs, despite differences in the underlying data and methodology. Therefore, the results of the disadvantage assessment can be used to support Flood Risk Management Strategies / Plans developed for each of the 14 Local Plan Districts covering Scotland that take into account PVAs. It notes that alongside Stirling, the Scottish Borders, and Moray, Perth and Kinross has the highest average proportion of residential properties exposed to river flooding.

2.21 The Mapping flood disadvantage in Scotland 2015 study also expresses concerns about and conclusions on the reasons for properties built on floodplains after January 1st, 2009. These were broadly either: firstly, that they were in process for a long time before construction and the FRA was based on earlier data; secondly, a sense that there were many competing priorities besides flooding and planners must make pragmatic decisions; or thirdly, that elected members can go against officer recommendation and approve planning applications.

2.22 **Private water supplies** are presumed against in NPF4 unless they will be sourced from a sustainable water source that is resilient to periods of water scarcity. SEPA provides information on water scarcity. Also, there is a knowledge review on water scarcity by University of Dundee Water scarcity in Scotland (arcgis.com)(November 2023). This refers to a recent study commissioned by NatureScot which shows how these changes could result in droughts becoming more frequent, longer and more severe even over the next 2 decades. For more details on climate trends there is also a James Hutton Institute Executive Summary of Climate Trends (July 2023) projections and extremes in Scotland and implications for Natural Capital and Policy paper.

2.23 There is also a CREW (Centre for Expertise for Waters) report, Private Water Supplies and Climate Change which considers the vulnerability of existing Private Water Supplies to climate change and potential mitigations. Using risk mapping, this study estimates that approximately half of the Private Water Supplies in Scotland are estimated to be within areas of High or Very High- (risk categories between 2020 and 2050). This study identifies at risk areas through a Drought Risk Indicator to help identify locations of high Private Water Supplies density and high probability of experiencing dry years in the

future. The category is a combination of the density of Private Water Supplies and probability of dry years increasing. The purpose of this indicator is to illustrate where in Scotland the highest probability of increased precipitation deficit is.

2.24 The CREW report recommends policy prescription on fit-for-purposes technologies for collection and treatment of water is a feasible way to help build resilience in decentralised, small rural supplies. For example, a change of source (e.g. from spring to borehole) can be a sensible course of action in areas where bedrock aquifers have the potential to sustain borehole water supply, and when vulnerability to drought and contamination co-occur for a given Private Water Supplies or supply zone. Also the report identifies the potential role of household water storage capabilities as back-up support to non-drinking water uses during drought. This may be more suitable for non-drinking water use.

Summary Context and Analysis

This section sets out a summary analysis of this evidence base and identifies any gaps or uncertainties.

2.25 The Perth and Kinross area faces a range of development pressures and future threats from sea level rise and flood risk. The future of Perth harbour, sea level rises, and coastal erosion risk is covered in the coastal development and aquaculture topic paper 11.

2.26 The current Perth and Kinross Local Development Plan (LDP) 2019 identifies appropriate opportunities for development with controls applied within flood risk areas. However, this LDP2 was based on Scottish Planning Policy (SPP) 2014, and the new NPF4 introduces 'at risk areas' which refer to the SEPA future flood maps which include climate change projections. The Proposed Plan will accord with NPF4, refer to these future flood maps, and use the SEA site assessment template to assess risk for all proposals being considered for potential LDP3 allocation.

2.27 SEPA's water environment hub will be also used to complete SEA site assessments at the Proposed Plan stage. This tool will be used to identify existing pressures on water bodies and the site assessment will identify whether policies and proposals are likely to exacerbate existing pressures, create new problems and offer opportunities for enhancement.

2.28 The mapping flooding disadvantage in Scotland study was concerned about new properties being built within the floodplain. It indicates key reasons why and this knowledge could potentially inform the preparation of the Proposed Plan as the objective is to limit the future instances.

2.29 The analysis of natural flood risk management opportunities within the SFRA in appendix 1 may inform and be informed by future blue and green infrastructure mapping considered in topic paper 21 Blue and Green Infrastructure.

2.30 In terms of Private Water Supplies, NPF4 presumes against these unless they will be sourced from a sustainable water source that is resilient to periods of water scarcity. A review of currently available

studies has been undertaken. There are useful sources of information such as the drought risk indicator. However, there is no equivalent to the SEPA flood risk mapping to identify which areas are at most risk, nor an associated national planning policy approach for these areas. Also, there may be a need to investigate whether the drought risk indicator is available as a GIS layer for Local Authorities to use.

Summary Context and Analysis key points

This current LDP2 (2019) was based on Scottish Planning Policy (SPP) 2014, and the new NPF4 introduces 'at risk areas' which refer to the SEPA future flood maps which include climate change projections. The Proposed Plan will accord with NPF4.

The analysis of natural flood management within the SFRA in appendix 1 may inform and be informed by the blue and green infrastructure mapping which is considered further in topic paper 21 Blue and Green Infrastructure.

There is no equivalent to the SEPA flood risk mapping to identify which areas are at most risk of not being resilient to periods of water scarcity for Private Water Supplies. NPF4 provides an overall policy approach for Private Water Supplies but it is perhaps unclear how this policy should be implemented.

Summary Context and Analysis key discussion points for feedback

Are there additional Private Water Supplies information sources which should be considered?

Will updated SEPA surface water flood risk mapping including provision for climate change be available to inform the Proposed Plan?

Can the CREW GIS drought indicator layer be provided to Local Authorities?

Implications for the Proposed Plan

The initial implications of the evidence for the Proposed Plan which have been identified so far are set out below. This will be revised and updated following consultation on this Topic Paper.

2.31 The analysis of existing LDP2 allocations in the SFRA attached to this paper will inform the spatial strategy of LDP3, it could act as a screening tool for identifying sites which will need further analysis of flood risk constraint. The SFRA will primarily support the Local Development Plan in responding to the spatial implications of NPF4 Policy 22 by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding. Resilience will also be supported by managing the need to bring previously used sites in built up areas into positive use (dependent on the vulnerability assessment); and planning for adaptation measures.

2.32 There will be detailed SEA site assessment of all sites which are considered for the Proposed Plan, and this will provide a more detailed assessment of flood risk than the SFRA.

2.33 Consideration of the research on mapping flooding disadvantage also suggests to properly implement policy and limit the instances of development within at risk/floodplain areas, there could be an enhanced focus on member engagement on flood risk matters. One of the other reasons mentioned (of sites taking time to come forward and being based on an older FRA) is largely outwith the Local Authorities control. However the approach taken at Mu73 Almond Valley whereby on this long term strategic site, the overall masterplan permission requires each phase which comes forward as a planning application to be based on a new FRA could be a way to mitigate this issue.

2.34 Findings of the SFRA will identify potential opportunities to implement improvements to the water environment through natural flood management and blue green infrastructure. The Proposed Plan spatial strategy will identify and protect blue and green infrastructure assets and networks (via the Planning (Scotland) Act 2019, and subsequently NPF4); and seek to enhance and expand existing provision including new blue and/or green infrastructure. Blue and Green Infrastructure is considered in more detail in topic paper 21.

2.35 Consideration could be given as to whether there are areas and/or types of supply proposed for Private Water Supplies where further assessment of their climate change resilience is required. The drought indicator method has not been developed to assess individual Private Water Supplies. However the drought indicator alongside figures 9 and 10 of the CREW report Private Water Supplies and Climate Change could be a useful starting point to assess vulnerable locations. It could potentially help identify where a Private Water Supplies risk assessment procedure considering climate change related risks is required and where/when a planning response and mitigations may be required. Consideration could also be given to where connection to a public water supply as opposed to reliance on a Private Water Supplies might be required.

Summary of key implications for the Proposed Plan:

The Proposed Plan will accord with NPF4, and the FRMPs.

The Proposed Plan will refer to SEPA future flood maps, and SEPA's water environment hub, and use the SEA site assessment template to assess flood risk, and consider pressures on water bodies, for all proposals being considered for LDP3 allocation.

There will be detailed SEA site assessment of all sites which are considered for the Proposed Plan.

Should the Proposed Plan promote sites where a potential flood risk is identified on part of the site, then it will be necessary to assess them using the UK 2018 climate change projections climate change allowances to calculate the area "at risk of flooding or in a flood risk area" and this will clarify the developable area.

There will be a need to consider whether the Proposed Plan should provide additional guidance on Private Water Supplies, to help implement the NPF4 policy presumption against Private Water Supplies unless they will be sourced from a sustainable water source that is resilient to periods of water scarcity.

Key discussion points for feedback

Is NPF4 sufficient or is there a need for further guidance in the Proposed Plan for Private Water Supplies?

When part of a promoted site lies within an at risk area, should flood risk assessment (FRA) be required prior to allocation in the Proposed Plan, or should the FRA be a requirement of the Proposed Plan for the planning application stage?

Appendix 1: Strategic Flood Risk Assessment

July 2024

Contents

3 Introduction

Why are we preparing this Strategic Flood Risk Assessment (SFRA)?

3.1 Local development planning guidance requires that local development plans (LDP) are informed by a Strategic Flood Risk Assessment (SFRA), which should be prepared at the Evidence Report stage.

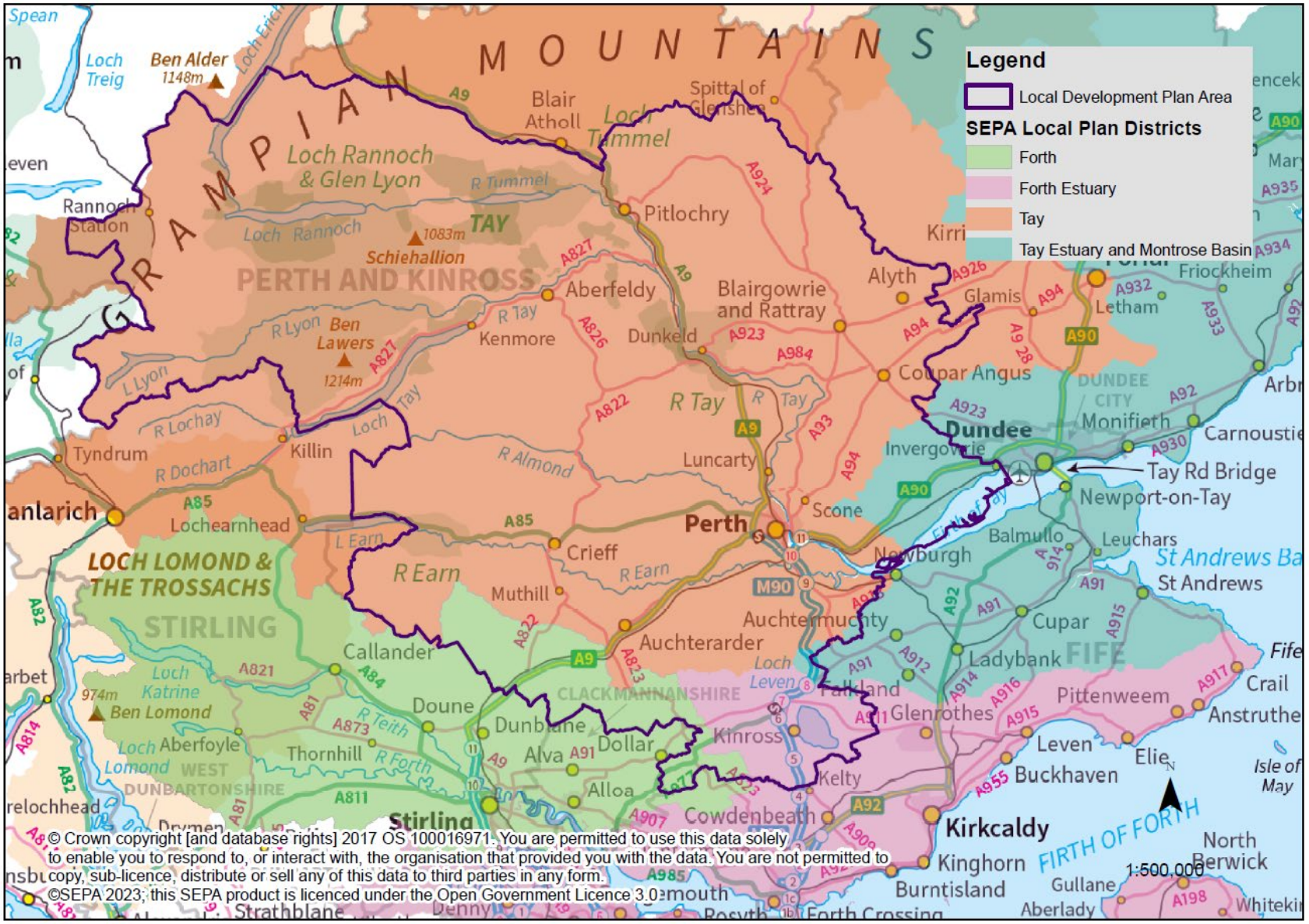
3.2 A SFRA is a simple, high-level, primarily map-based overview of the scope and nature of all sources of existing and future flood risk within the local development plan area. The assessment will primarily help to inform the preparation of the next local development plan by delivering the intention of National Planning Framework 4 (NPF4) Policy 22 to strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding.

3.3 This SFRA has been prepared in accordance with Scottish Environment Protection Agency (SEPA) guidance (2023) and in consultation with SEPA and flood risk specialists within Perth and Kinross Council.

3.4 The purpose of an Evidence Report is to provide the Local Authority's interpretation of the evidence it has gathered and the likely implications of that evidence for the preparation of the LDP. The Report will provide a summary of what the evidence means for the plan, rather than contain all the detail of evidence collected.

What geographic area does this SFRA cover?

Figure 1: SFRA area: is the Local Development Plan area and includes the majority of the Tay Local Plan District where Perth & Kinross Council is the lead authority, whilst it includes small areas of three other surrounding districts - the Forth, Forth Estuary and the Tay Estuary & Montrose Basin.



What are the aims and objectives of this SFRA

3.5 The primary aims of the SFRA are to ensure that future development is directed wherever possible towards areas of little or no flood risk and to ensure that new development does not increase flood risk elsewhere (for example by affecting the storage or conveyance capacity of floodplains).

3.6 Its main objectives are to:

- Identify where flood risk exists in the plan area at the Evidence Report stage, and therefore areas where new development should be located or avoided at the Proposed Plan stage 1, in accordance with Policy 22 of National Planning Framework 4.
- Identify areas where there is a risk of flooding as per NPF4, but the development may meet with NPF4, and where more detailed analysis of flood risk will be required.
- Identify areas where climate change is resulting in unmanageable flood exposure, and so where alternative land use is needed, in accordance with National Planning Framework 4.
- Identify where and how actions contained in the local flood risk management plan (including future flood protection schemes) affect the location of new development.
- Inform blue and green infrastructure audits and / or strategies in support of Policy 20 of National Planning Framework 4.
- Inform the strategic environmental assessment (SEA) of the Local Development Plan.
- Provide evidence to support the Local Development Plan in taking into account other relevant NPF4 policies, to help take an integrated place-based approach to tackling the climate emergency and nature crisis.

3.7 As well as informing the Local Development Plan, the Strategic Flood Risk Assessment outputs can also be used to support a place-based approach to development and service delivery. For example, the Strategic Flood Risk Assessment could also be used:

- by developers, communities (including for their Local Place Plans), individual applicants
- to support wider infrastructure planning and delivery
- to support the local authorities' services such as emergency planning and resilience

2 Policy context

National context

This section sets out the key policies and which will inform the Proposed Plan and can address the issues raised in the Act and in NPF4.

4.1 National Planning Framework 4's Policy 22: Flood risk and water management aims to strengthen resilience to flood risk by reducing the vulnerability of existing and future development to flooding and promoting avoidance as a first principle. The policy states that Local Development Plans should strengthen community resilience to the current and future impacts of climate change, by avoiding development in areas at flood risk as a first principle. Resilience should also be supported by managing the need to bring previously used sites in built up areas into positive use; planning for adaptation measures; and identifying opportunities to implement improvements to the water environment through natural flood management and blue green infrastructure.

4.2 SEPA Flood Risk and Land Use Vulnerability Guidance and the Planning Information Note 4 SEPA (position on development protected by a flood protection scheme, which will be updated to take account of NPF4), will be important to interpreting and understanding National Planning Framework 4's Policy 22: Flood risk and water management.

4.3 The Flood Risk Management (Scotland) Act 2009 promotes a risk-based, plan-led approach to managing flood risk. It requires Scottish Environment Protection Agency and other designated responsible authorities to develop and implement Flood Risk Management Plans and Local Flood Risk Management Plans. These contain a significant amount of information on potential flood hazards and risks which can be drawn upon to inform the Strategic Flood Consequences Assessment.

Local Context

4.4 Local Development Plans should take into account the probability of flooding from all sources and make use of relevant flood risk and river basin management plans for the area. A precautionary approach should be taken, regarding the calculated probability of flooding as a best estimate, not a precise forecast. For areas where climate change is likely to result in increased flood exposure that becomes unmanageable, consideration should be given to alternative sustainable land use.

4.5 The Strategic Flood Risk Assessment will primarily support the Local Development Plan in responding to the spatial implications of NPF4 Policy 22 by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding. In doing so the Strategic Flood Risk Assessment will also provide evidence to help take other NPF4 policies into account, including:

- Policy 1 Tackling the Climate and Nature Crises
- Policy 2 Climate Mitigation and Adaptation

- Policy 3 Biodiversity
- Policy 4 Natural Places
- Policy 6 Forestry, Woodland and Trees
- Policy 10 Coastal Development
- Policy 13 Sustainable Transport
- Policy 18 Infrastructure First
- Policy 20 Blue and Green Infrastructure
- Policy 21 Play, Recreation and Sport

4.6 Flooding in Scotland is being managed through 14 local plan districts which are based on river catchments. The local authorities are working in partnership to manage flood risk within these districts. SEPA has published a Flood Risk Management Plan (previously referred to as the 'Strategy') for each district and the lead local authorities have published a local flood risk management plan.

4.7 Perth & Kinross Council is the lead authority for the Tay district as well as being involved in three other districts - the Forth, Forth Estuary and the Tay Estuary & Montrose Basin.

4.8 The process of flood risk assessment, flood mapping and planning required by the Flood Act will be repeated every six years (2016-2022, 2022-2028, 2028-2034 etc) with the long-term goal of reducing the impact of flooding across Scotland over time. In combination with increasing education and awareness within communities about how they can protect themselves from flooding, the measures adopted under the Flood Act will be aimed at reducing the impact of flooding on residents and businesses in Perth & Kinross with consequent benefits for all including a safer environment, the reduction in flood damage and improved health and wellbeing.

5 Methodology

This section sets out the methodology used to prepare the SFRA.

Overview

5.1 This assessment follows the methodology set out in SEPAs Guidance for planning authorities on Strategic Flood Risk Assessment' (2023). The methodology contains four key steps:
Step 1: Gathering available information;
Step 2: Gap analysis, in which gaps in the evidence are identified;
Step 3: Prepare the outputs, in which all the collated information is presented, and a report drafted; and
Step 4: Discuss with SEPA, in which this draft assessment material is reviewed prior to publishing of the final draft of the report to support the Evidence Report

Step 1 Gathering available information

SEPA guidance sets out the relevant data sources required to inform the assessment.

5.2 These sources are:

- SEPA flood hazard maps
- SEPA climate change allowances
- SEPA natural flood management opportunity maps
- Information on Flood Defences and Flood Protection Schemes
- Local authority Flood Studies
- Information on past flooding events
- Local Flood Risk Management Plans and Flood Risk Management Plans
- Dynamic Coast
- Reservoir inundation maps
- Surface Water Management Plan
- Adaptation Plans and Coastal Change Adaptation Plans
- Section 16 Assessment of risk from the sewer network maps

Step 2 Gap Analysis

A summary of the data used in this assessment alongside known gaps in the evidence is provided in this section.

5.3 **Geography –** where settlements have settlement boundaries identified in LDP2 (2019) they have been used in this assessment to consider the impact of flood risk on these settlements for planning purposes. It should be noted however, that many of these settlement boundaries and their allocations are likely to undergo revision in the Proposed Plan. Strategic Environmental Assessment | Scottish Environment Protection Agency (SEPA) provides a template for site assessment which will be used at Proposed Plan stage to consider any proposed allocations.

5.4 **SEPA Flood hazard maps and climate change allowances** - the river, coastal and surface water extent data used in this report comes from Version 2.1 of SEPA flood hazard maps. National Planning Framework 4 states that:

"For planning purposes, at risk of flooding or in a flood risk area means land or built form with an annual probability of being flooded of greater than 0.5% which must include an appropriate allowance for future climate change".

5.5 Within this SFRA, SEPA Future Flood River and Coastal Maps have been used to inform the assessment. Currently, this data is based on UK 2009 Climate projections but will be updated to reflect the UK 2018 climate change projections. Given the strategic scale of the assessment it is not possible to apply SEPA 2018 climate change allowances. However, it is acknowledged that should the Proposed Plan promote sites where a potential flood risk is identified within part of the site, and if the SEPA flood hazard mapping has not been updated to the 2018 climate change data, then it will be necessary to assess them using the allowances to calculate the area "at risk of flooding or in a flood risk area". Whether this happens prior to allocation in the Proposed Plan or is a requirement of the Proposed Plan for the planning application stage will be considered through the topic paper engagement.

5.6 When future surface water flood map layer is available (spring 2025 at latest), this will be used. The surface water present day low likelihood flood map layer is the best proxy in the meantime. This layer used the medium likelihood flood event with an increase in rainfall intensity of 20% nationally. This layer may provide a first indication of those areas potentially at risk from surface water flooding in the future, however due to projected changes in rainfall intensity it may not show all locations that may be affected in the future.

5.7 **Natural flood management** involves techniques that aim to work with natural hydrological and morphological processes, features and characteristics to manage the sources and pathways of flood waters. These techniques include the restoration, enhancement and alteration of natural features and characteristics, but exclude traditional flood defence engineering that works against or disrupts these natural processes.

5.8 SEPA Natural Flood Management data indicates areas where land use change opportunities to restore nature could reduce flood risk. There are currently no Perth and Kinross Council implemented natural flood management within the area, however Alyth, Blackford and potentially Aberfeldy Flood Protection Schemes once confirmed may include natural flood management areas. The Blackford and Aberfeldy schemes are currently at preferred option stage. Whilst the Alyth natural flood management flood study is currently being reviewed by SEPA. Also, there are lots of landowners undertaking their own natural flood management works, examples include Blackford Farms, in collaboration with Forth Rivers Trust, and Bamff Estate upstream of Alyth.

5.9 Under NPF4 Policy 5 (Soils), LDPs are required to protect "land of lesser quality that is culturally or locally important for primary use." The NPF4 glossary describes this land as being of value to decision

making and includes examples such as land with primary use for 'flood management' and 'water catchment management'. The Council will monitor progress of emerging FPS including Aberfeldy and Blackford, and Alyth, to consider whether there are any natural flood management areas which might be confirmed and protected for flood management purposes in the Proposed Plan.

5.10 In terms of private natural flood management measures, there is no evidence source which has compiled this information, however landowner feedback on their natural flood management schemes could inform the LDP Proposed Plan.

5.11 In terms of potential opportunities SEPA Natural flood management data, flood study outputs, and the SEPA surface water flood risk mapping provides information on natural flood management opportunities. This report presents this natural flood management data/analysis at settlement level, whereas the green blue network mapping will consider opportunities at a catchment scale. Please refer to topic paper 21 Blue and Green Networks for more detail.

5.12 **Past flood events** there is a GIS layer which includes all flood events up to November 2019 whilst reference is also made to the flood location registers for significant events between 2019 up to March 2024. SEPA were unable to provide access to their recorded flood incidents database due to licensing issues. SEPA are currently working on a new licence to go to partners so that an updated copy of observed flood event data can be shared. This SEPA data will be considered within the finalised SFRA if it is available, but cannot be published. Also, historic flood studies can have more detailed info on flood risk. The Council have completed a number of flood studies in known flood risk areas as follows: Aberfeldy, Almondbank, Alyth, Bankfoot, Birnam, Blackford, Burrelton, Comrie/Dalginross, Coupar Angus, Craigie Burn (Perth), Dalguise, Dunkeld, Greenloaning, Inchyra (appraisal), Invergowrie, Kinross (south), Logierait, Longforgan, Meikleour, Milnathort, Perth, Pitlochry and Scone. The Council has also a number of ongoing or planned flood studies within the current published Local Flood Risk Management Plans (Cycle 2 2022-2028). These are for Aberfeldy (SWMP), Alyth (natural flood management), Blairgowrie & Rattray SWMP, Bridge of Earn, Comrie (SWMP), Kinross (SWMP), Luncarty, Methven, Perth (SWMP) and Scone (SWMP, natural flood management and flood study).

5.13 Table 1 provides details for the more significant incidents considered in this assessment, and all the mapped incidents up to November 2019 are shown on the settlement maps. There have been a number of significant flood events within Perth and Kinross in the past. These include major flooding events in 1990 and 1993 that affected large parts of Perth and events in 2006 and 2015 that affected many locations across rural Perthshire.

5.14 **Within the Perth and Kinross there are formal flood defences** to reduce the risk of flooding to properties at locations that have suffered flooding in the past such as Perth, Bridge of Earn, Weem and Milnathort. However, construction and maintenance of formal

defences is expensive and therefore the construction of these has been limited to those areas where the cost is justified. Although defences reduce risk, they are only designed to protect for a flood event of a given size. If a flood event exceeds the current (as opposed to design) standard of protection, then flooding may occur.

5.15 The current standard of protection for flood defences built in the past may be greater or lesser than the original design due to increased data on river flows and tide heights, the methods used to calculate flood events and primarily the effects of climate change.

5.16 **Flood defence** information has been obtained and SEPA flood maps show areas that are protected by formal flood defences. The following details the flood protection schemes currently operating.

Completed Perth Flood Defence Scheme 1995

5.17 Perth Flood Prevention Scheme is formed in three parts by Inveralmond, Bridgend and Lower City Mills respectively. The scheme is designed to protect Perth City from flooding from the River Tay and the Scouring and Craigie Burns. It includes culvert improvements, embankments, walls, sluice gates, raise ground levels, pipes, ponds, and pumping stations, and 77 operational flood gates, and was completed in 2002.

5.18 The defences were tested in January 2005 when the River Tay, swollen by melting snow and heavy rain, threatened again to flood Perth but the city escaped significant flooding. December 2006 was an even larger event than 2005, but again the city defences worked well. The city has been exposed to significant weather events including Storms Desmond and Frank in Dec 2015 and Jan 2016 respectively, with several properties and roads affected. The 'Beast from the East' (March 2018) caused limited flooding issues. More recently, Perth was affected by surface water flooding in August 2020, when approximately 165 properties were affected, and again in September 2022, when approximately 30 properties were affected.

5.19 Also, a major flood event impacted upon Perth during 6-9th October 2023 with approximately 63 homes and caravans, and Bells sport centre, all experiencing internal flooding of property. A full review of the Perth Flood Scheme Gate Closure Operational Procedure, in partnership with SEPA, will be undertaken as part of the improvement plan developed from the findings of the review.

5.20 Perth & Kinross Council has carried out significant maintenance, clearance and repair works on the Perth Flood Protection Scheme, including works on the North Muirton Flood Embankment in 2019 and 2020. These are examples of the statutory obligations on Perth & Kinross Council as Responsible Authority.

Completed Almondbank Flood Protection Scheme 2018

5.21 Almondbank and Lochty have experienced a long history of flooding from the River Almond and the East Pow Burn, with serious flooding events taking place in 1993, 1999 and 2011. With average annual flood damage estimated at £1.2 million using the Treasury Green Book Assessment, Perth & Kinross Council needed to invest in more robust

flood defences to protect residential and commercial properties and infrastructure in the town of Almondbank.

5.22 The project involved the creation of a series of flood defence structures and a temporary flood storage area that would provide protection for the area for a 1:200-year event at the time of the design. The scope of works included:

- Installation of 1,150 linear metres of sheet-piled flood walls
- 1,600 metres of reinforced concrete flood walls
- 50 metres of earth embankments
- 2,000 metres of erosion protection measures
- Raising and replacement of two vehicle access bridges
- Relocation of the existing pedestrian bridge

Completed Weem Village Flood Mitigation Scheme 1998

5.23 Weem was severely affected by the January 1993 flood. Six properties including Weem Hotel were affected. The scheme consists of realignment of the Lade, 640m of embankment and installation of a pumping station. The Weem Village Flood Mitigation Scheme was completed in September 2006. A standby generator was installed in April 2009 to provide a failsafe electricity supply to the existing pumping station.

Completed Comrie Flood Protection Scheme 1998

5.24 Comrie has experienced a history of flooding from the Water of Ruchill, the River Earn and the River Lednock. The most recent significant flood events occurred in January 1993, February 1997, December 2006 and in August and November 2012. In 2013, the Council completed the following flood protection works to reduce the risk of flooding to the Dalginross area from the Water of Ruchill:

- Rock armour protection to the riverbank on the Water of Ruchill at Ruchilside;
- The removal of the old flood embankments at Tomnagaske;
- A new flood embankment at Camp Road.

5.25 The original design standard of protection provided against flooding from the Water of Ruchill was equivalent to the predicted 1 in 100 year return period flood, with an allowance for climate change, at the time of the design. This corresponds to the flood event that has a 1% chance of being exceeded in any one year.

Completed Milnathort Flood Mitigation Scheme 2002

5.26 Milnathort was badly affected by flooding from the Back Burn in January 1993 with over 40 properties affected. The scheme consists of repairs to existing walls, the construction of new flood walls, service diversions below the Wester Loan Bridge and the installation of non-return valves. The Milnathort Flood Mitigation Scheme was substantially complete in August 2006, however, further flooding in December 2006 within Milnathort resulted in a review of the scheme.

A new flood wall replaced the former bund at Wester Loan, Milnathort and further improvement measures are being considered.

5.27 SEPA flood maps which show areas that are protected by formal flood defences, and in due course the areas at risk may be reduced by the following proposed flood protection schemes, which are in various stages of progress towards completion. Flood risk management plans and local flood risk management plans provide information on ongoing and future actions that are needed to manage flood risk, and which communities those actions planned for as follows:

Proposed Comrie Flood Protection Scheme

5.28 The 1998 flood protection works do not address the remaining flood risk from the River Earn or the River Lednock, or the combined risk from all three rivers. This proposed scheme is designed to protect 189 homes and businesses, some of which have previously been affected by flooding in Comrie. The scheme will significantly reduce the flood risk to those properties from three rivers; the River Earn, the River Lednock and the Water of Ruchill. Once complete, it will provide a standard of protection equivalent to a flood event with 0.5% chance of occurring in any given year (a 1 in 200 year flood event), with a further factor of safety (known as 'freeboard') to allow for the uncertainties involved in flood estimation and other physical factors such as wave action.

5.29 The detailed design of the flood scheme was concluded in spring 2023. The flood scheme involves the construction of flood walls and embankments. The exercise to procure a contractor for the main works is ongoing, but the Council are aiming to have appointed a contractor by summer 2024, with the main construction works to follow on at the end of the summer.

Proposed Scone Flood Protection Scheme

5.30 A flood protection scheme has been proposed to address the risk of river flooding to the Goshenbank Park and Burnside area in Scone from the Annaty Burn. The preferred option consists of raising existing footbridges and constructing riverside defences. The scheme would provide a 1 in 200-year standard of flood protection. The commencement of the work to develop the scheme has been delayed. The development of the proposals will be informed by community engagement.

5.31 The delivery of the Annaty Burn Flood Protection Scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Perth & Kinross Council's capital programme).

5.32 Historically, Kinross has suffered from repeated flooding, with records going back to 1852. Significant flooding occurred more recently in January 1993, December 2006 and February and August 2020. The main flood risk to homes and businesses comes from the South Queich, the Gelly Burn and the Clash Burn. The scheme will reduce the risk of flooding to 177 properties across Kinross up to the predicted 1 in 200 year flood on the above noted bodies of water. The

Scottish Government and the Council have agreed in principle to fund the scheme. The scheme includes a series of new flood walls and embankments, culvert upgrades and flood storage. A flood notice was published 28th March 2024 to advertise this scheme. The proposed scheme is intended to protect properties up to the 1 in 200-year flood event but remains subject to community consultation, statutory consents and the availability of sufficient funding.

Proposed Aberfeldy Flood Protection Scheme

5.33 There is a long record of flooding in this area. Significant floods have occurred in January 1993, January 2005, December 2006 and in December 2015. The most recent flooding was recorded in February 2020 during Storm Dennis. A flood protection scheme has been proposed in this area. The proposed scheme would consist of flood walls and embankments on the River Tay and the Moness Burn, along with culvert improvements on the Tomchulan Burn. The proposed scheme would provide a 1 in 200-year standard of protection. Current and long-term flood risk will be further considered at the design stage including the impacts of climate change and scheme adaptability. The outline design for the Aberfeldy Flood Protection Scheme will be progressed, in line with the recommendations of the Aberfeldy flood study. The flood study also recommended further consideration of natural flood management as part of the preferred option. This work is to also include ongoing community engagement as the project progresses.

5.34 The delivery of the Aberfeldy Flood Protection Scheme is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Perth & Kinross Council's capital programme).

Proposed Bridgend Surface Water Management Works

5.35 The design of the proposed Bridgend surface water management works has commenced. The proposed works include a high-capacity drainage channel and outfall to the River Tay.

5.36The delivery of the Bridged Surface Water Management Works is subject to capital funding being made available (up to 80% capital grant funding from the Scottish Government with the remaining funding being provided from Perth & Kinross Council's capital programme).

Proposed Craigie Flood Protection Works

5.37 The study estimates that up to 57 properties are potentially at risk during a 1 in 200-year flood event (the flood event with a 0.5% chance of occurring in any one year). In future, this is estimated to increase to 114 properties due to the effects of climate change. The flood study recommends the following two actions: a) upgrade and increase the capacity of the existing culvert on the Craigie Burn at Queen's Avenue (at the access to Queen's Court). B) localised channel modifications on the Craigie Burn (adjacent to Balmoral Place and Queen's Avenue) upstream and downstream of the upgraded culvert. If these actions were to be implemented, then the estimated flow capacity of the

channel of the Craigie Burn at Queens Avenue would increase from its current 1 in 5-year flood to the predicted 1 in 100-year flood. A total of 22 properties would be protected up to the 1 in 100-year flood (and up to 18 properties would benefit in the 1 in 200-year flood).

5.38 The funding has been provided in budget approved by Full Committee. This will now be progressed outwith the typical FRM delivery cycle approach.

Proposed Dunkeld Flood Protection Works

5.39 The study has involved the completion of investigations undertaken by previous consulting engineers, Mouchel, into the flooding on Atholl Gardens and Atholl Street, Dunkeld from the Spoutwells Burn and another small watercourse. The flood study identified a viable option that provides flood protection for Dunkeld in the vicinity of Sawmill Brae, Spoutwells Burn and the town centre.

5.40 The funding has been provided in budget approved by Full Committee. This will now be progressed outwith the typical FRM delivery cycle approach.

Proposed Blackford Flood Protection Scheme

5.41 A flood protection scheme has been proposed in this area. The proposed scheme involves a combination of river flow diversions, direct flood defences and natural flood management. It aims to provide a 1 in 200-year standard of protection. Current and long-term flood risk will be further considered at the design stage including the impacts of climate change and scheme adaptability. The outline design for the Blackford Flood Protection Scheme will be progressed, in line with the recommendations of the Blackford Flood Study. This work will also include ongoing community engagement as the project progresses.

5.42 The delivery of this scheme is subject to capital funding being made available by the Scottish Government and within Perth and Kinross Council's capital programme.

Flood Risk Management Plans and Local Flood Risk Management Plans

5.43 The management plans identify Potentially Vulnerable Areas, which are areas where significant flood risk exists now or is likely to occur in the future and they help those involved in flood risk management (including private property owners) to understand and prioritise where work could benefit the most. The Potentially Vulnerable Areas are updated and published every six years as part of the flood risk management planning cycle. They were first identified in 2011 and were updated in 2018. In December 2027 they are due to be updated again for use in Cycle 3 of the flood risk management cycle, with a SEPA led public consultation planned earlier in the year.

5.44 For cycle 2 Perth and Kinross Council led on the Tay Local Plan District December 2022, and contributed to the preparation of the Forth Local Plan District December 2022, and the Forth Estuary Local Plan District December 2022, and the Tay Estuary & Montrose Basin Local Plan District, interim report 2019.

5.45 **Dynamic Coast** data assists as becoming 'sea level wise' is required of the planning system to adapt to future risks. A small area at Kingoodie was identified as having a coastal erosion risk in LDP2 based on the National Coastal Change Assessment at that time. However, no areas are now shown at risk in the more recent Dynamic Coast webmaps Future Erosion 2100 High emissions scenario. This information will be used to inform site selection, and settlement summary text in the Proposed Plan.

5.46 **Surface water management plans (SWMP)** there is a Milnathort SWMP complete, and linked to a small flood scheme, Blairgowrie and Rattray and Perth SWMP's are ongoing with a Summer/Autumn 2024 completion target. Aberfeldy, Comrie, Kinross and Scone SWMPs have not commenced yet. These plans may inform the Proposed Plan if/when they have been completed prior to the site assessment process.

5.47 **Reservoir inundation** due to licensing limits, SEPA data is not available to directly analyse against data using Perth and Kinross Council's Geographical Information Systems. However, it is available via SEPA online portal, SEPA Controlled Reservoirs Register. However the probability of failure of a reservoir structure managed under the 2011 Act is considered to be so low that it is beyond the scope of risk considered within NPF4 for land use planning.

5.48 **Risk from the sewer network** originates from Section 16 of the Flood Risk Management (Scotland) Act 20092 and places a duty on Scottish Water to assess flood risk from sewerage systems. Mapping of this risk exists for Kinross, Milnathort, Auchterarder, Comrie, Dunkeld, Pitlochry, Blairgowrie, Coupar Angus, Bankfoot, Scone and Almondbank sewer catchment areas within this SFRA area. The data largely mirrors SEPA pluvial flood hazard maps (particularly for bigger return periods), so this data can only be used for an internal sense check to identify areas of misalignment which could be worthy of further investigation. This data cannot be published externally, due to the data sharing agreements in place, and therefore, while it has been considered as part of the assessment it is not featured in in this report.

Step 3 Prepare the outputs

SEPA guidance sets out that all collated information should be presented in a primarily map-based form with a brief summary report.

5.49 This report sets out the approach taken to the assessment and provides a summary of its findings. It is acknowledged that flood risk information is ever evolving, and therefore this assessment represents a snapshot in time that will in time become out of date. A review of information will therefore be required in advance of carrying out site assessments for the Proposed Plan.

Step 4: Discuss with SEPA

SEPA guidance sets out that they will be happy to review the summary report at this draft stage and advise whether they consider the SFRA to be sufficient.

5.50 Provided that the SEPA SFRA guidance has been followed and that any evidence gaps highlighted in Step 2 are identified in the summary report, it is likely that SEPA will be content with the SFRA being a sufficient high-level overview of the scope and nature of all sources of existing and future flood risk within the local development plan area at that point in time. If so this SFRA can be used to inform/be referenced in the Evidence Report. This consultation seeks the views of SEPA as to whether this draft SFRA is sufficient or what amendments are required before it is finalised. This consultation also seeks broader public and stakeholder engagement.

4 Outputs

This section sets out the outputs from the SFRA which are needed to support the preparation of the Proposed Plan by LDP3 settlement.

Outputs by River catchment area

6.1 The following sections provide the basis for Step 3 of the SFRA methodology, providing by catchment area (see Figure 1) and by settlement a summary of the flood hazards within Perth and Kinross Local Development Plan area, namely: the Tay, Tay Estuary & Montrose Basin, Forth, and Forth Estuary catchment areas

- Tay catchment area (page 28)
- Tay Estuary and Montrose Basin catchment area (page 118)
- Forth catchment area (page 130)
- Forth estuary catchment area (page 138)

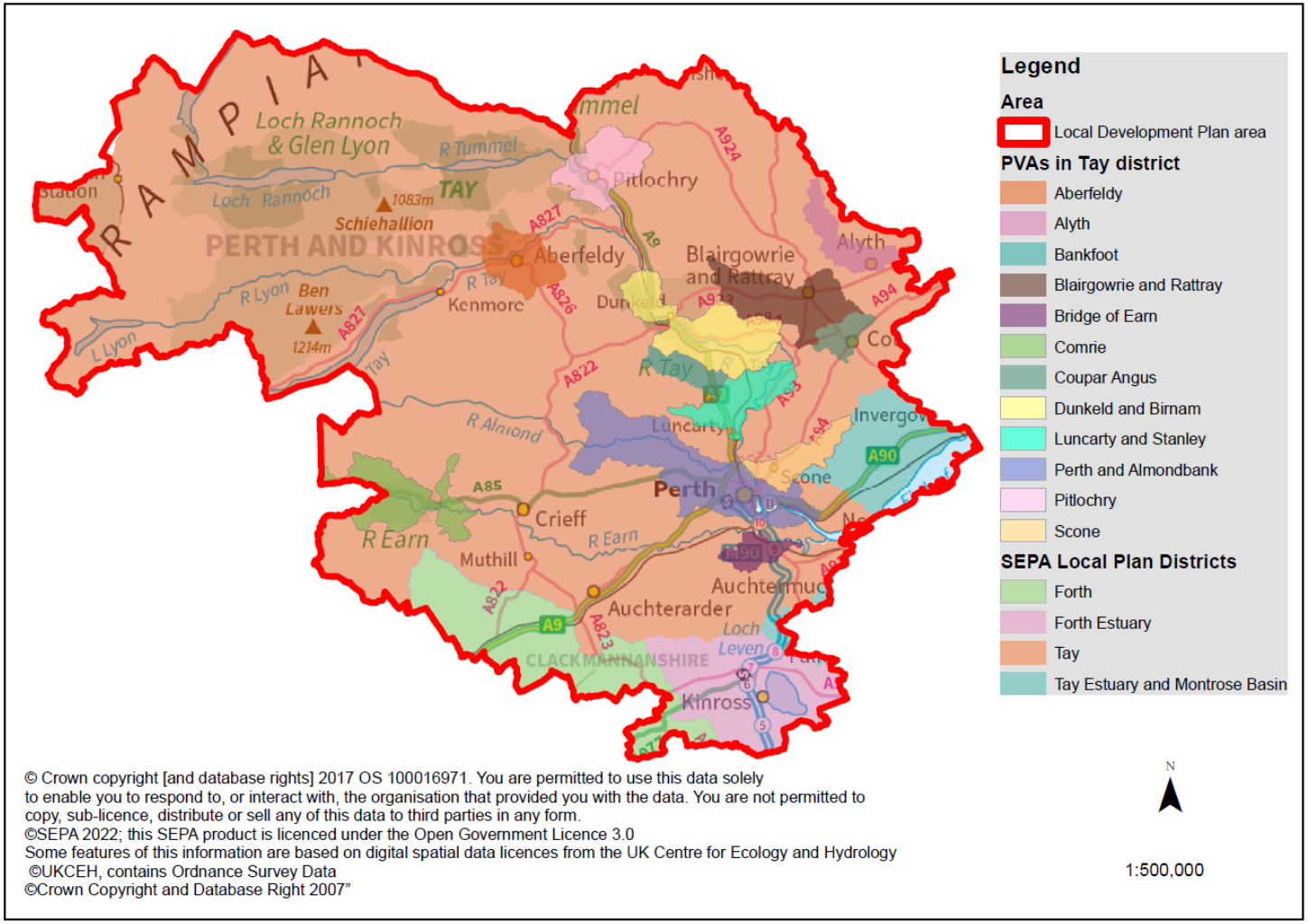
6.2 Outputs will be provided at a settlement scale, providing information on the following:

- If in target area of a PVA - FRMP number of properties/businesses affected
- A settlement map showing how SEPA flood mapping, and flood history mapping (up to November 2019), affects the settlement, and LDP2 allocations.
- Accompanying narrative highlighting where the LDP existing allocations intersect with the SEPA 2080 river, and coastal medium risk layers, and low risk surface water areas, and how SEPA flood risk mapping and past flood events (up to March 2024) impact on settlement as a whole.
- accompanying narrative on SEPA natural flood management opportunities, and any considered through flood studies. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Outputs for Tay River catchment area

6.3 This section provides results for the LDP2 Settlements in the Tay catchments area. Figure 2 shows the 12 (those within this LDP area) of the 14 Potential Vulnerable Areas (PVAs) within the Tay River catchment area.

Figure 2 Tay district PVAs within Perth and Kinross Council Local Development Plan Area



6.4 The LDP2 settlements in this catchment are as follows: Aberargie, Aberfeldy, Abernethy, Aberuthven, Acharn, Alyth, Ardler, Auchterarder, Balbeggie, Balinluig, Balnaguard, Bankfoot, Binn Farm, Blairgowrie and Rattray, Bridge of Cally, Bridge of Earn and Oudenarde, Burrelton and Woodside, Butterstone, Camserney, Caputh, Carsie, Clathymore, Comrie, Concraigie, Coshieville, Cotton and Chapelhill, Coupar Angus, Craigie, Crieff, Croftinloan, Donavourd, East Haugh and Ballyoukan, Cromwell Park and Pitncairngreen, Cultybraggan, Dalcrue, Dull, Dunkeld and Birnam, Dunning, Fearnan, Forgandenny, Forteviot, Fortingall, Fowlis Wester, Gilmerton, Gleneagles, Grandtully, Strathtay and Little Ballinluig, Guildtown, Kenmore, Kettins, Kinfauns, Kinloch, Kinloch Rannoch, Kinnaird (Highland), Kinrossie, Kirkmicheal, Logierait, Luncarty, Meigle, Meiklour, Methven, Murthly and Gellyburn, Muthill, Perth, Perth Airport, Pitlochry, Scone, Spittalfield, St David's, St Madoes and Glencarse, Stanley, Tibbermore, Trochry, Tummel Bridge, Weem and Boltachan, and Wolfhill

6.5 Outputs for how flood risk impacts on all these settlements, and the opportunities for natural flood management are provided as follows.

Aberargie

6.6 Aberargie does not lie within a PVA, and there are no recorded flood events. However, it is significantly affected by SEPA river flood risk mapping (see figures 3 and 4), with the western half of the settlement within at risk areas (see figure 4).

Figure 3 Aberargie Flood risk map

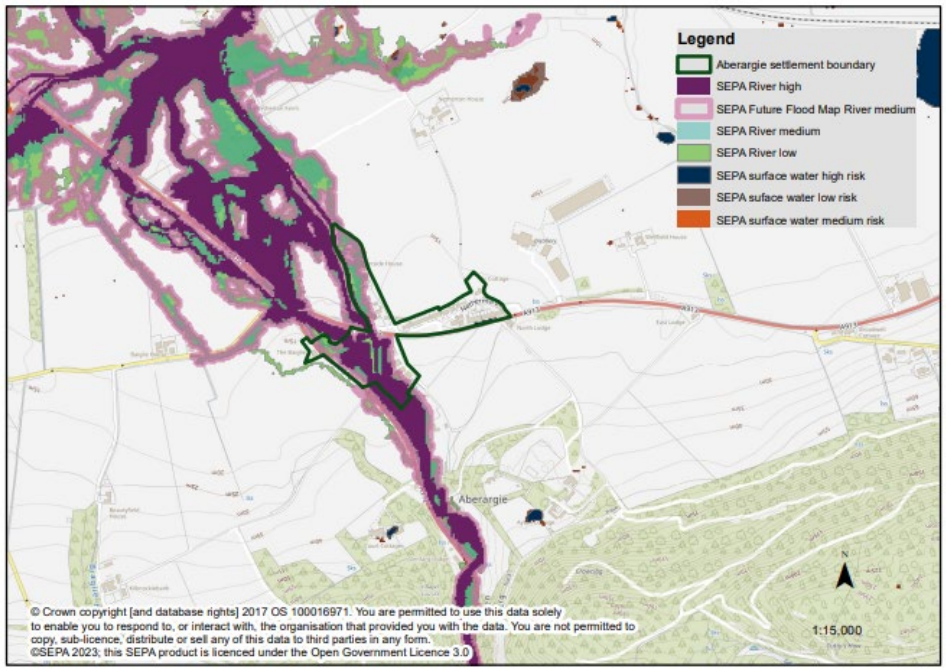
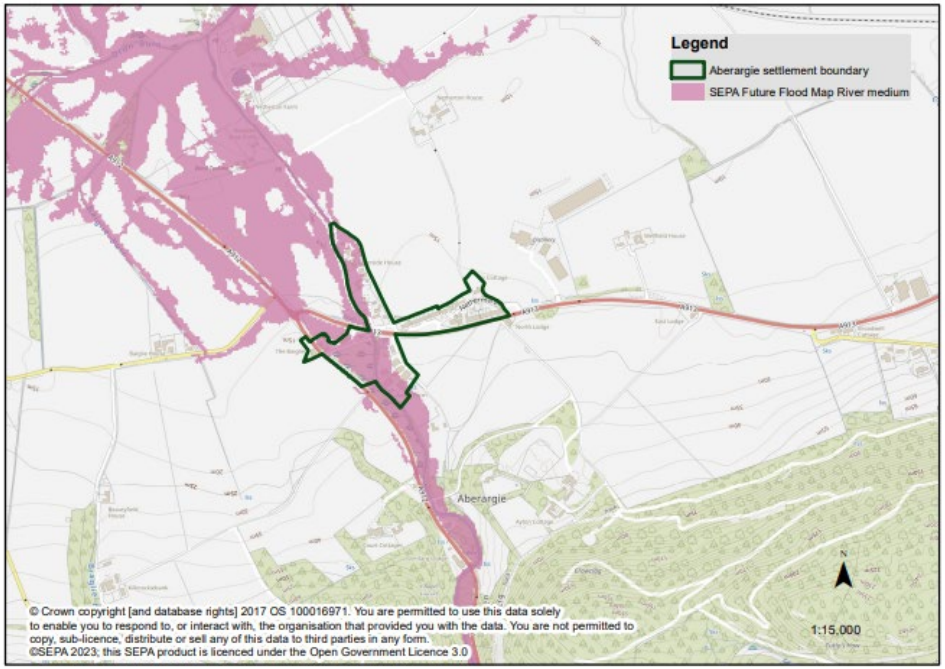


Figure 4 Aberargie Flood risk map (at risk areas)



6.7 There are substantial natural flood management opportunities related to floodplain storage and sediment management. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Aberfeldy

6.8 Aberfeldy lies within the Aberfeldy and Weem PVA. Within the Aberfeldy target area there are approximately 128 residential properties and 40 non-residential properties at risk of flooding in the PVA. There is a long record of flooding in this area. Significant floods have occurred in January 1993, January 2005, December 2006 and in December 2015. Flooding was also recorded in February 2020 during Storm Dennis, and you can see the flood event records on figure 5. Also, there was flooding of a property on Taybridge Terrace on the 27th December 2023. Also not mapped as it was post November 2019, but there was 15 properties at the caravan park flooded on the on 8th of October 2023, and the road closed from Wades Bridge to Hotel on corner (B846).

6.9 The Aberfeldy flood study was completed in October 2019 and recommended a flood scheme involving new flood defences on the River Tay, the Moness Burn and culvert improvements on the Tomchulan Burn. The proposed scheme would protect a total of 164 properties, providing a 1 in 200-year standard of flood protection.

6.10 Aberfeldy is affected by SEPA flood risk mapping, (see figures 5 and 6) although the LDP2 E10 and H36 allocations are outwith the indicative extents, they will be subject to detailed FRA when they come forward as planning applications.

Figure 5 Aberfeldy Flood risk

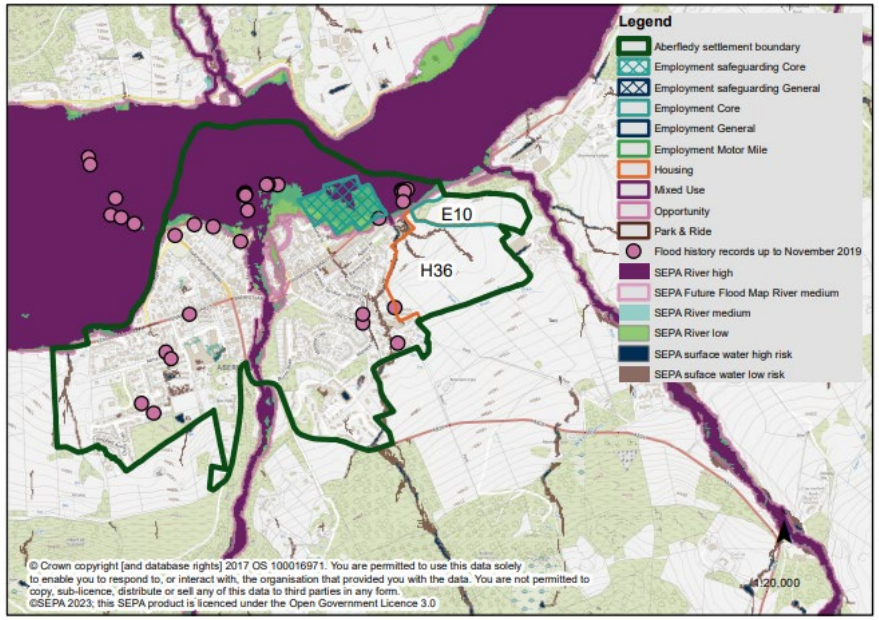
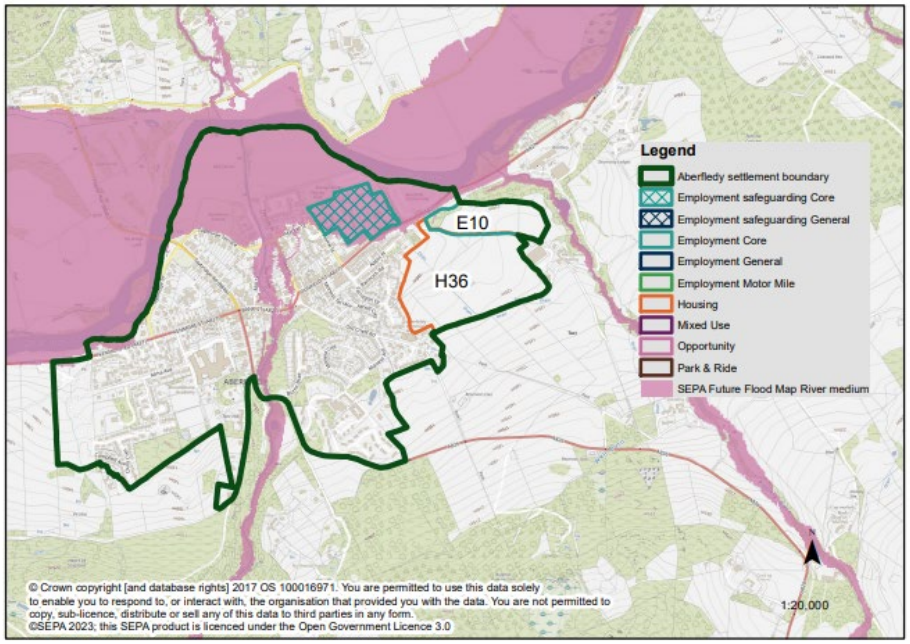


Figure 6 Aberfeldy Flood risk (at risk areas)

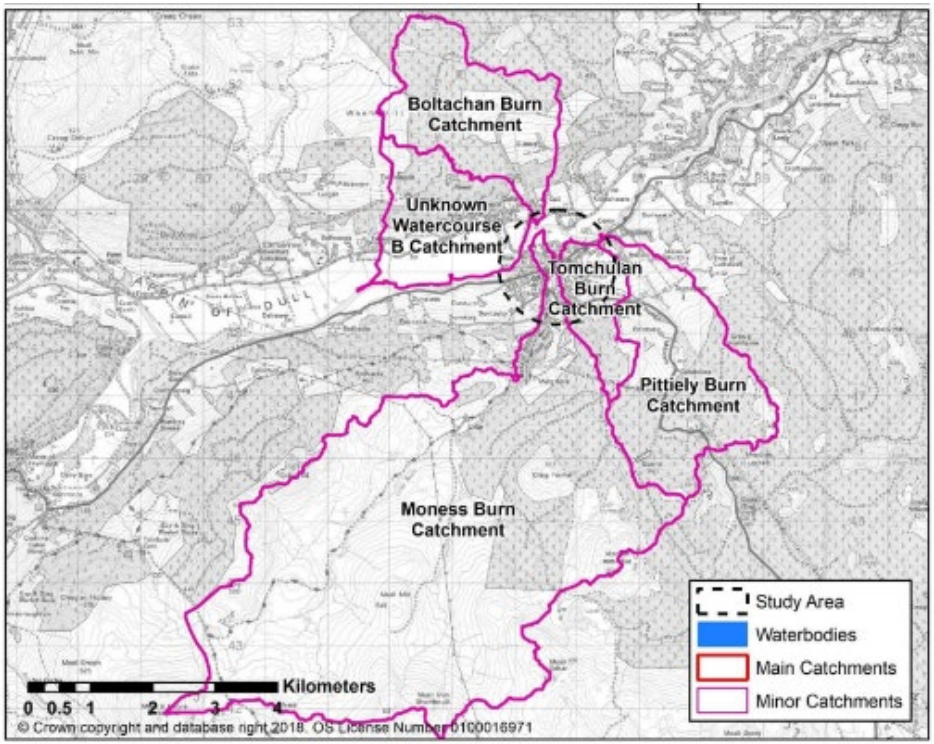


6.11 In terms of natural flood management opportunities there are floodplain storage opportunities to the north of the settlement associated to the River Tay, and sediment management opportunities too. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

6.12 The flood study feasibility report which was published October 2019 recommends that natural flood management is further considered during future stages of the Aberfeldy Flood Study project so that measures may be incorporated as part of the preferred option to potentially realise some of the other benefits that natural flood management offers e.g. improvements in biodiversity and water quality.

6.13 It was found that the Moness catchment to the south of Aberfeldy would have the greatest potential for natural flood management measures and you can see the Moness Burn catchment on figure 7.

Figure 7 Aberfeldy Burn Catchments



6.14 The natural flood management measures which were identified as potentially being suitable for the catchments influencing Aberfeldy are:

- Non-floodplain wetland enhancement/creation
- Drainage modification
- Land use management techniques
- Catchment woodlands

- Instream structures
- Floodplain woodlands

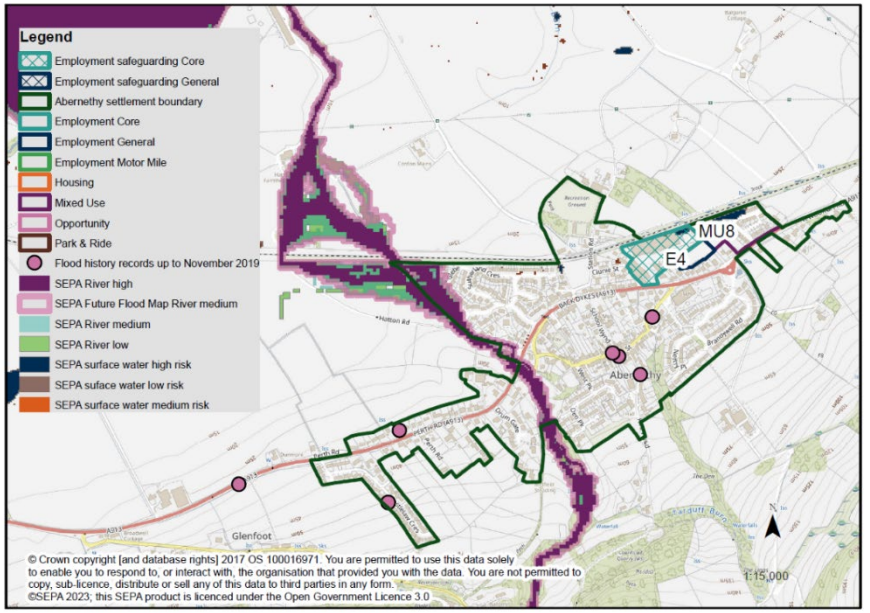
6.15 This study includes a map which shows the potential natural flood management opportunities identified. The delivery of this scheme and natural flood management is subject to capital funding being made available by the Scottish Government and within Perth and Kinross Council's capital programme.

Abernethy

6.16 Abernethy does not lie within a PVA. However, there are some pluvial flood event records which you can see on figure 8, and there are areas impacted by river flood risk, and the Mu8 allocation is affected by SEPA surface water food risk at its northern extent, and there is a developer requirement for an FRA. There was also a property flooded on Perth Road, on the 27th of December 2023. An application (ref:18/01016/FLL) was approved August 2019 for a wide range of works at LDP2 site E4 and partially site MU8 including the erection of a cold storage building and formation of new access road. For the remainder of the mixed use site (MU8), an application (ref: 17/02190/FLL) has been approved for the development of 39 dwellinghouses. Construction of these uses commenced in February 2021.

6.17 In terms of Natural Flood Management opportunities there are no opportunities within the settlement and there are some surface water flood risk areas, and floodplain storage opportunity areas to the west. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 8 Abernethy Flood risk

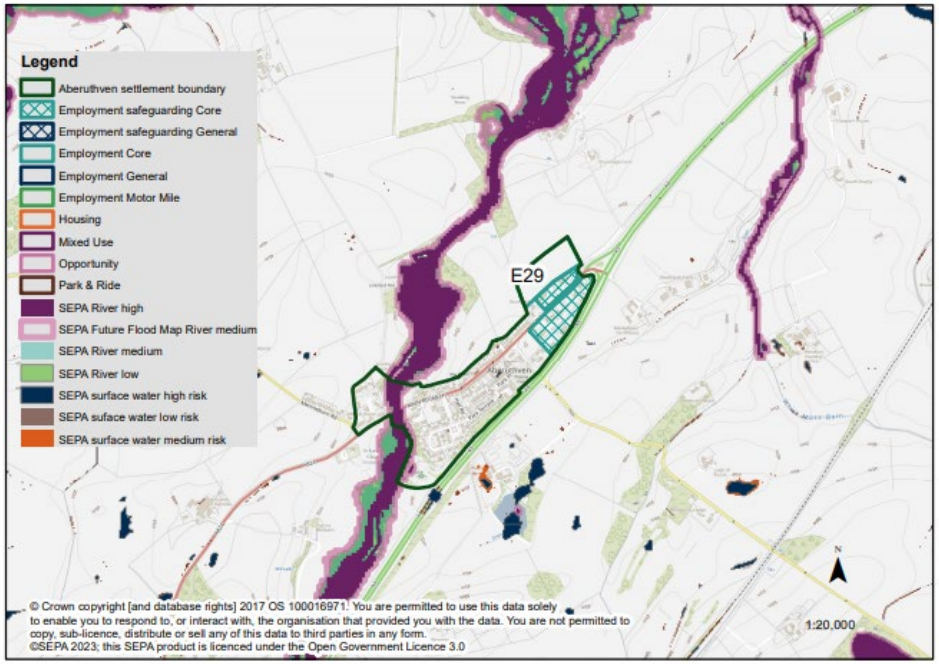


Aberuthven

6.18 Aberuthven does not lies within a PVA, and there are no flood event records associated to the settlement from before November 2019. The SEPA flood risk mapping extents do affect Aberuthven (see on figure 9). However, a property on Loanfoot Park was flooded on the 27th December 2023.

6.19 In terms of Natural Flood Management opportunities, they are not within the settlement but there are some sediment management and floodplain storage opportunities outwith. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 9 Aberuthven Flood risk



Acharn

6.20 Acharn lies does not lie within a PVA, and there are no flood event records. However, it is significantly affected by SEPA river flood risk extents from Loch Tay (see in figures 10 and 11).

6.21 In terms of Natural Flood Management opportunities there are some sediment management opportunities within Acharn and outwith there are some surface water runoff and floodplain storage opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 10 Acharn Flood risk

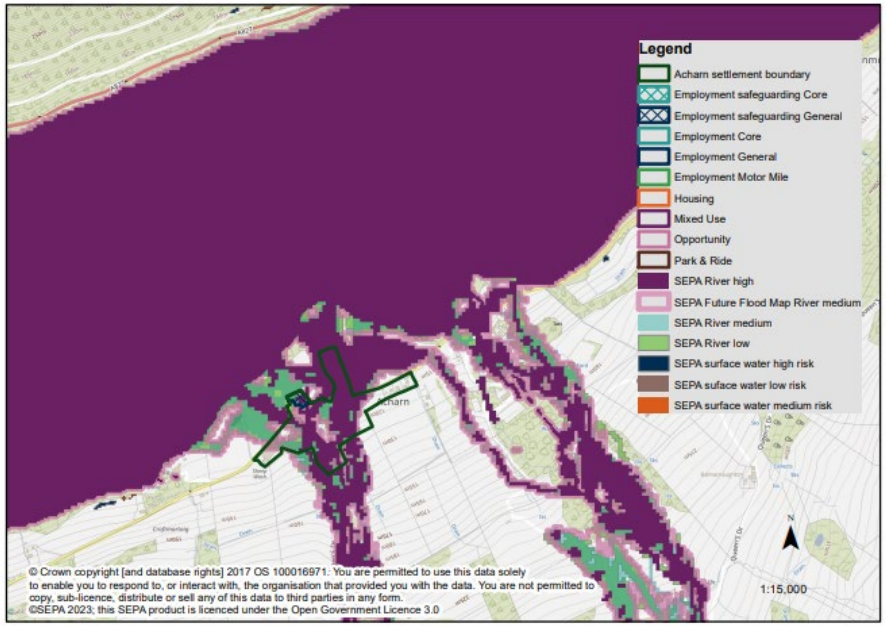
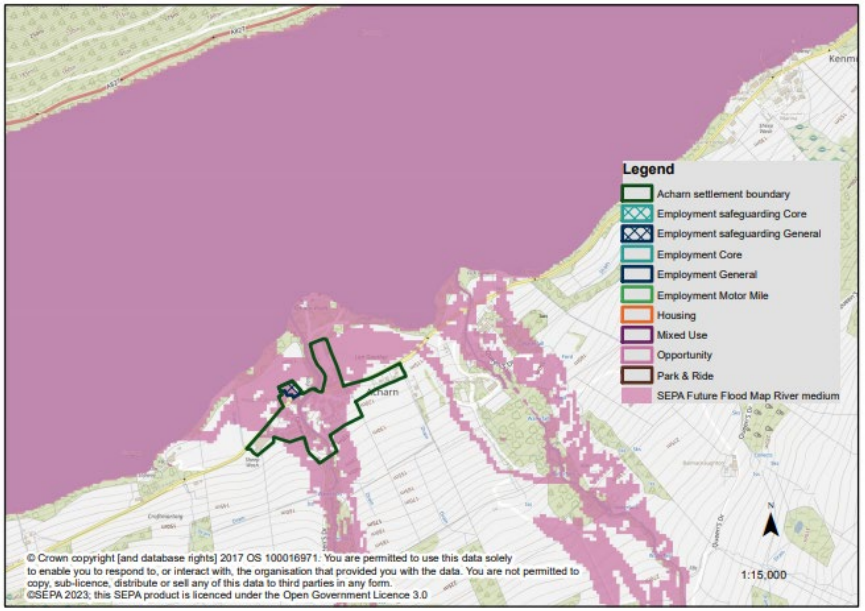


Figure 11 Acharn Flood risk (at risk areas)



Alyth and new Alyth

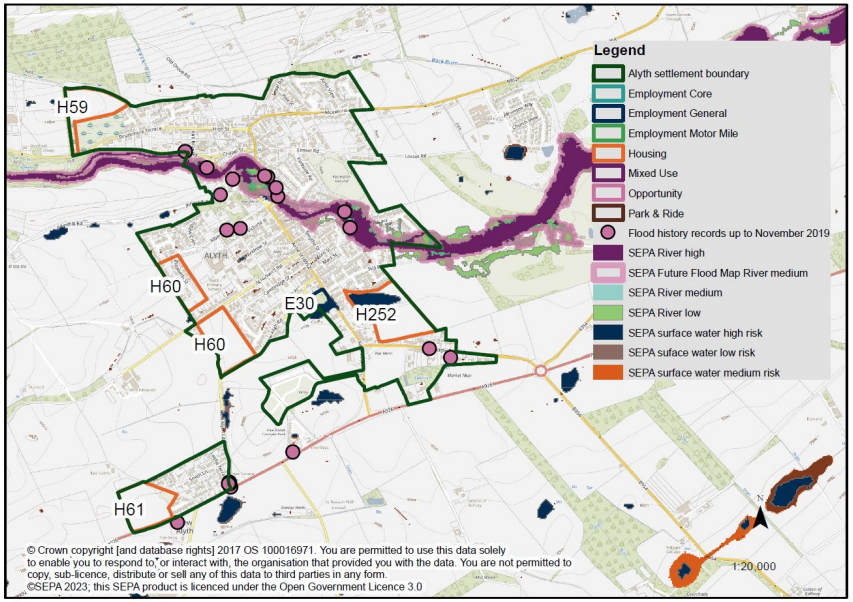
6.22 Alyth lies within the Alyth PVA. There are approximately 120 homes and businesses at risk of flooding in the Alyth PVA.

6.23 This PVA has been exposed to several recent significant weather events including Storms Desmond and Frank in December 2015 and January 2016. Although this did not result in any significant flooding of properties, several roads and low-lying agricultural land were affected. This followed on from an extreme flood event in July 2015 which affected approximately 59 properties in Alyth. Following the 2015 flood event, emergency works were carried out by Perth & Kinross Council to remove debris from the burn and replace collapsed structures. Perth & Kinross Council, SEPA and SNH produced a joint investigation report, which was disseminated to the public, as well as holding various public events to improve awareness and promote resilience within the community. The Scottish Flood Forum also attended these events and has continued to support the community through advice to the community council and residents.

6.24 In August 2020 a slow-moving storm impacted eastern Scotland, resulting in flooding from the Alyth and Johnshill Burns. Approximately 18 properties were affected by flooding. The Council carried out works on the Alyth Burn (to remove sediment and other debris deposited following the flood event) and repaired two collapsed sections of culvert on the Johnshill Burn. The Doctors Burn also flooded in August 2020 and twice in October 2020 as a result of high-water levels breaching a damaged length of agricultural embankment; this was subsequently repaired by the landowner. The flood event on 8th October 2023 also affected 5 properties (4 solum) on Meigle and Loyal Road. The flood event on 19th October flooded garages on Cambridge Street.

6.25 Alyth is significantly affected by flood risk from the Alyth Burn, and you can see on figure 12 the areas that have been affected by flood events recorded, and the extent of the SEPA flood risk mapping. This apart from some SEPA surface water flood risk this does not impact on the allocated sites for development. LDP2 H252 has not yet come forward as a planning application, but it will require an FRA if/when it does.

Figure 12 Alyth Flood risk

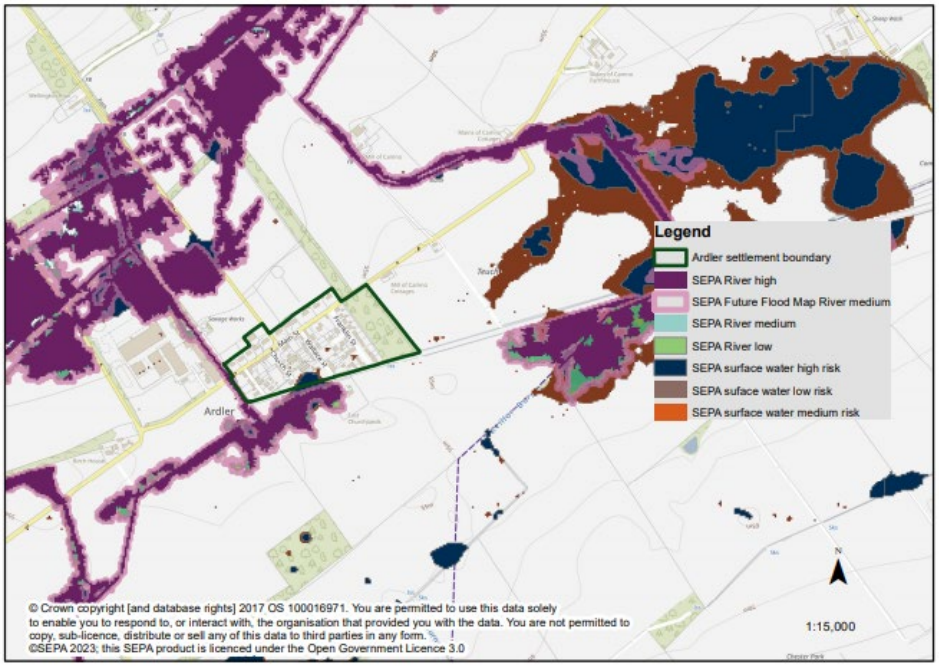


6.26 In terms of Natural Flood Management opportunities there are sediment management opportunities, and the surface water flood risk areas may also offer some opportunity. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer. A Flood Study completed in May 2024 is with SEPA for consideration. Its findings will be used in the decision-making process for selecting preferred options for Alyth. There are a couple of preferred options for Johnshill Burn (6 upgrades), and for Doctors Burn upgrades which could involve creating a storage area in the field to the east of the burn.

Ardler

6.27 Ardler does not lie within a PVA, and there are no flood events recorded. SEPA river flood risk extents only marginally affect the village at its western edge, and surface water flood extents affect an area to the south, you can see on figure 13. In terms of Natural Flood Management opportunities, there are no significant opportunities within the settlement, although there may be ones nearby with sediment management and surface water flood risk/floodplain storage opportunities to the north and east. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 13 Ardler Flood risk

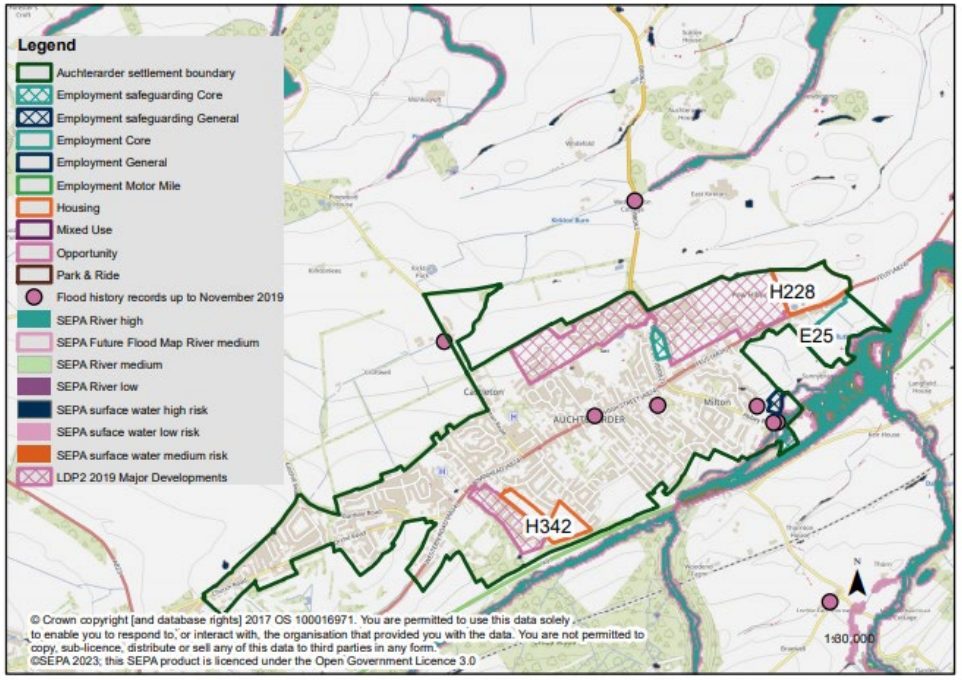


Auchterarder

6.28 Auchterarder does not lie within a PVA. To date there has been a limited flood event history. Please see Figure 14 which shows how SEPA flood risk mapping impacts on the settlement of Auchterarder, and its existing LDP2 allocations. The main area of flood risk relates to the southern edge of the settlement from the Ruthven water. Adjacent to this flood risk the LDP2 E25 employment land allocation has an in-principle permission granted April 2018 for 10 years. An FRA was carried out to support this application, and no built development or land raising shall occur within the 1 in 200 years plus climate change water level and finished floor levels shall be set no lower than 0.6m above the 1 in 200 year plus climate change water level indicated in the FRA. The settlement and opportunities for future growth both currently allocated and then future beyond this are not significantly constrained by flood risk.

6.29 In terms of Natural Flood Management opportunities, there are some opportunities related to sediment management of the Ruthven Waters, and runoff reduction potential. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 14 Auchterarder Flood risk

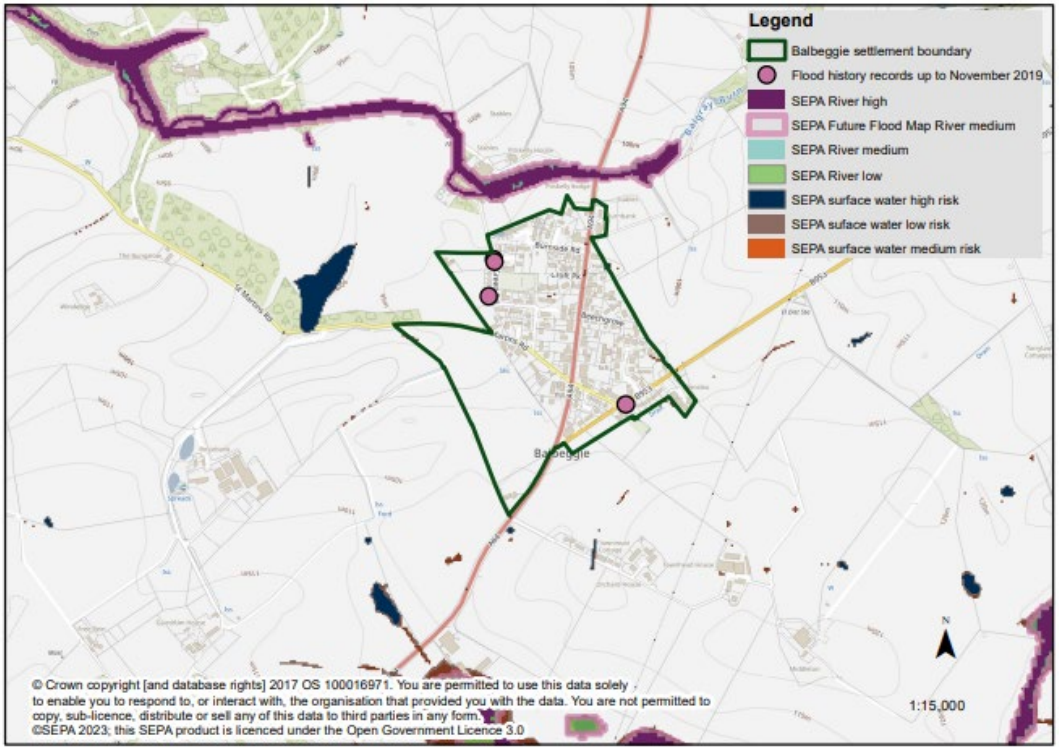


Balbeggie

6.30 Balbeggie does not lie within a PVA, and the SEPA flood risk mapping does not impact on the settlement. There is some flood event history with 2 houses flooded in August 9th 2004 due to surface water on Green Road, with another property flooded on Green Road on August 18th 2004, with some street level flooding on Abernyte Road on January 29th 2014. Please see Figure 15.

6.31 Balbeggie does not lie within a PVA, and the SEPA flood risk mapping does not impact on the settlement. In terms of Natural Flood Management opportunities, there are some opportunities related to sediment management to the north of the settlement. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 15 Balbeggie Flood risk map

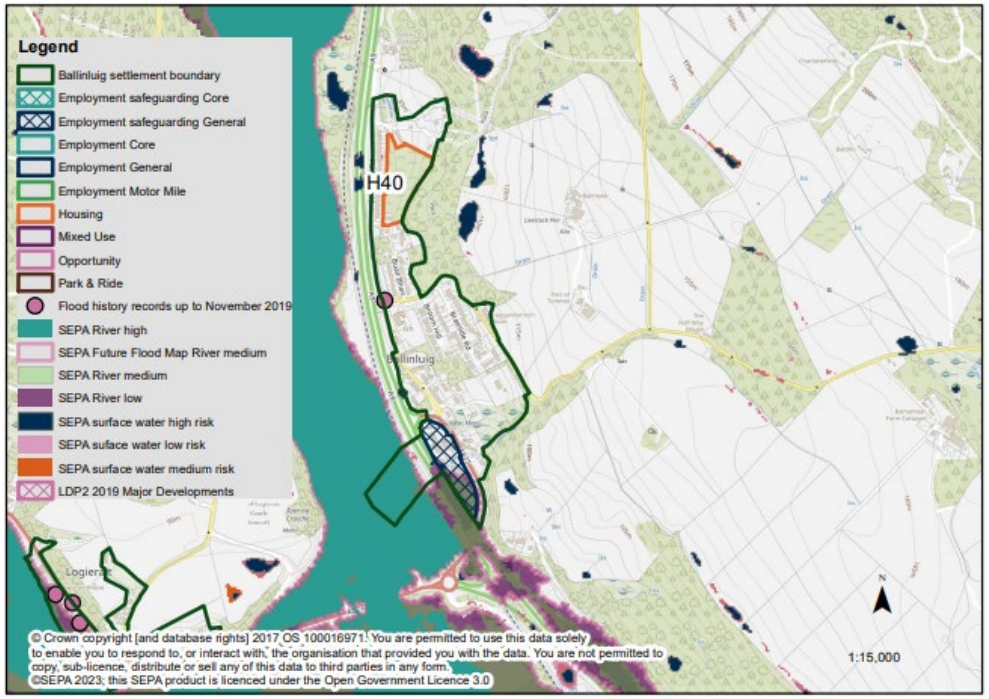


Ballinluig

6.33 Ballinluig does not lie within a PVA. To date there has been a limited flood event history, with a flooded road and landslip recorded 16th June 2017. Please see Figure 16 which shows how SEPA flood risk mapping impacts on the settlement of Ballinluig and note that the southern end of the LDP2 settlement boundary and part of the employment safeguarded site general area is affected by flood risk.

6.34 In terms of Natural Flood Management opportunities there are opportunities for flood plain storage and there are areas of high deposition and erosion which could be mitigated. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 16 Ballinluig Flood risk map

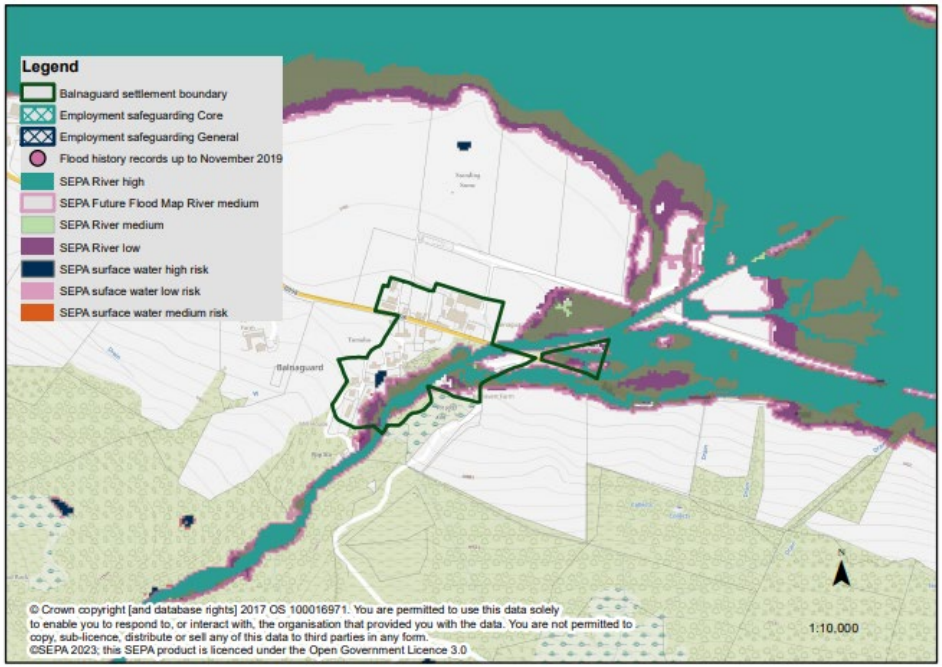


Balnaguard

6.35 Balnaguard does not lie within a PVA. To date there has been no recorded flood history within Balnaguard but there are substantial areas to the south and east of the settlement which are within an at risk area. Please see figure 17.

6.36 In terms of Natural Flood Management opportunities there are areas for run off reduction and for floodplain storage, and for reducing high erosion and deposition. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 17 Balnaguard Flood risk



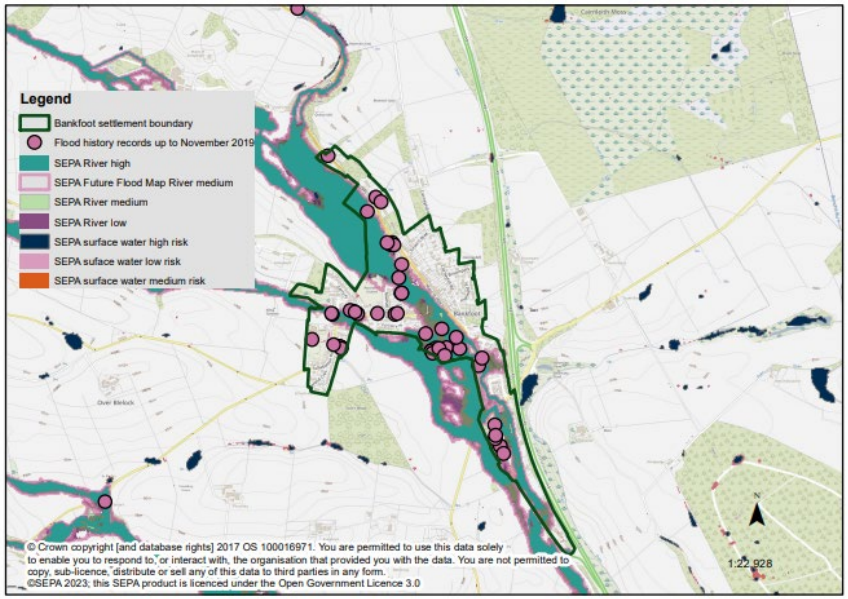
Bankfoot

6.37 Bankfoot lies within a PVA. The main source of flooding is the Garry Burn and Glenhauch Burn. A flood study in this area estimates that there are approximately 154 homes and businesses at risk of flooding. There is a history of flooding in this area, with recent floods being caused by river flooding, notable flooding in January 1993, August 2004, July 2015 and February and October 2020. In February 2020 during Storm Dennis, the Garry Burn burst its banks, inundating a number of roads. Some surface water flooding occurred in October 2020. Further minor flooding occurred on the Garry Burn in February 2021. Flooding occurred in June 2022, when surface water runoff from fields affected the B867 and the gardens of adjacent properties. The October 8th flooding also affected 9 properties (5 solum and 4 internal). The national assessment for river flooding was informed by a flood study completed for Bankfoot in 2015. The study concluded that a flood scheme was not economically viable. The study described how on-going flood risk would be managed by other actions.

6.38 Flood risk has significantly constrained the opportunities for development in Bankfoot, and there are no allocated sites in the current LDP2. Figure 18 shows how significantly flood risk affects areas within the settlement boundary.

6.39 In terms of Natural Flood Management opportunities, the main opportunity is for floodplain storage, and this can be seen in both the opportunity floodplain storage and the area of surface water flood risk. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

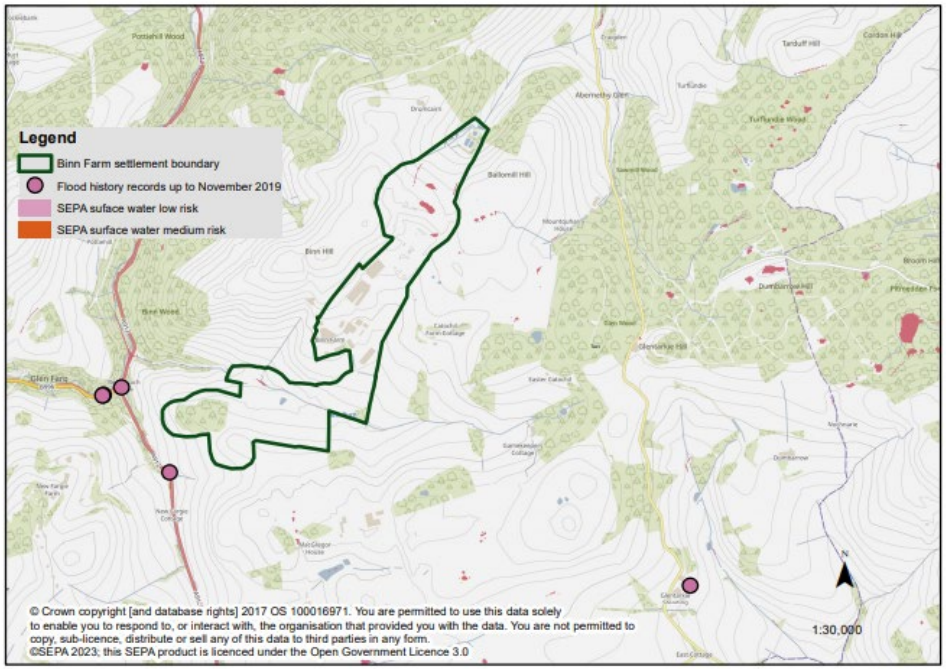
Figure 18 Bankfoot Flood risk map



Binn Farm

6.40 Binn Farm does not lie within a PVA. To date there has been no flood history records for Binn Farm. The extent of existing planning consents is shown as the settlement boundary on figure 19 and the whole site is identified for waste management uses. Flood risk does not significantly affect Binn Farm but there are some areas affected by surface water flood risk.

Figure 19 Binn Farm Flood risk



6.41 In terms of Natural Flood Management opportunities, the main opportunity is for run off reduction, and this can be seen in both the opportunity for run off reduction, and the areas of surface water flood risk. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

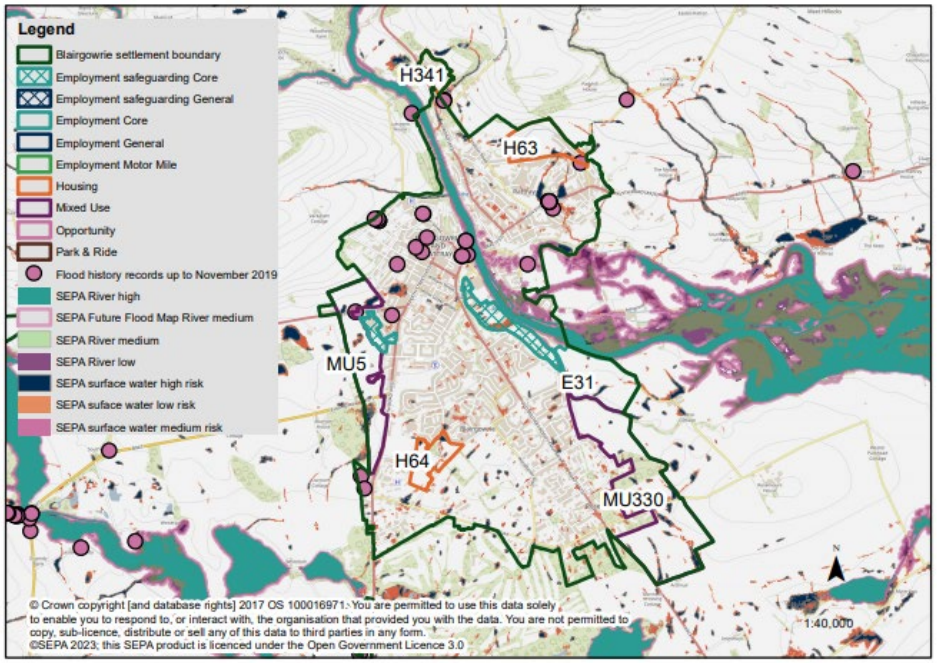
Blairgowrie and Rattray

6.42 Blairgowrie and Rattray lies within a PVA. The main source of flooding in Blairgowrie is surface water. There is a history of flooding in this area with recent flooding recorded in August 2020, October 2021 and November 2022. There are approximately 750 people and 440 homes and businesses currently at risk from flooding.

6.43 There is a long record of flooding in this objective target area. In July 2004 a road and 2 properties were affected by surface water flooding. In July, October and December 2015 heavy rainfall led to flooding of a number of properties as well as road flooding. Flooding was recorded on 12 August 2020 when local roads and 5 properties flooded as a result of heavy rainfall in the area. In October 2021 flooding on the Rattray Burn affected 1 property in Rattray. Further flooding occurred on the Rattray Burn in November 2022. Perth and Kinross Council has engaged consulting engineers to develop a surface water management plan for Blairgowrie and Rattray. This will investigate the surface water flood risk and identify potential options for managing that risk. The results of the sewer flood risk assessment will be considered.

6.44 To date there have been significant flood history records and these have impacts various parts of the communities (see on Figure 20). However, it has not significantly impacted on the opportunities for growth, and the LDP2 allocations are not located within the at risk areas.

Figure 20 Blairgowrie and Rattray Flood risk map



6.45 In terms of Natural Flood Management opportunities there are significant sediment management opportunities particularly to the east of Blairgowire and Rattray and floodplain storage opportunities here (West Mill and East Mill and vicinity) too associated to the River Ericht. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

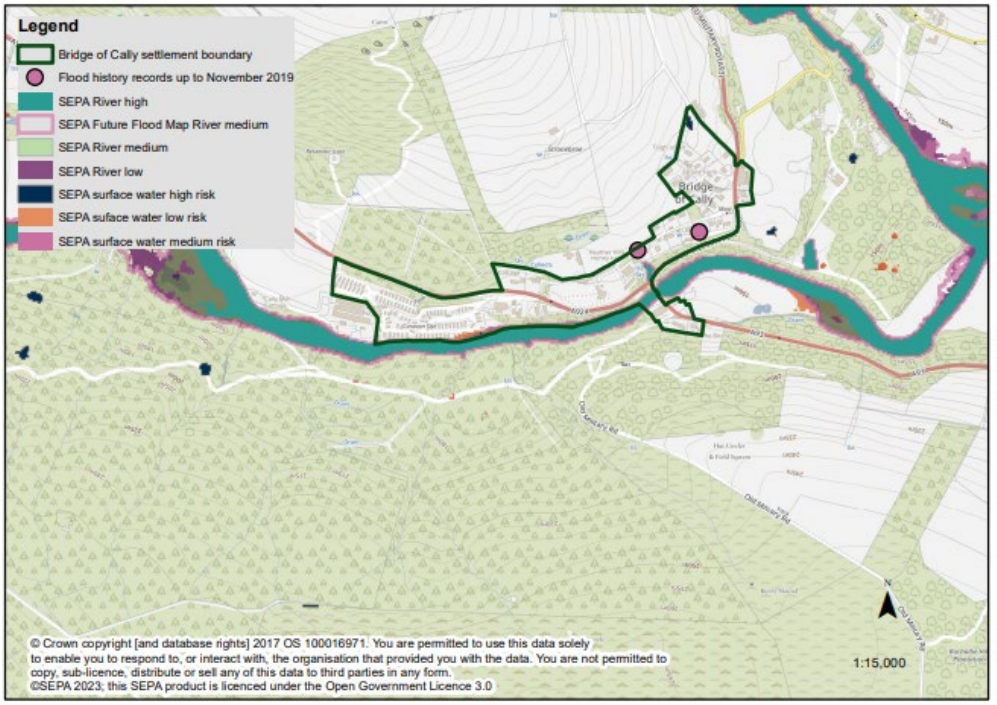
Bridge of Cally

6.46 Bridge of Cally does not lie within a PVA. There has been some flood history within the village itself, and the main bridge was significantly damaged in October 2021, and then again December 2023. The October 2021 event resulted in the bridge parapet to the east side being completely washed away and the road was closed, whilst the road also had to be closed due to the December 2023 event.

6.47 The settlement boundary of Bridge of Cally includes holiday accommodation at the western end of the village. The LDP2 settlement boundary was drawn to allow for some small-scale infill development to help sustain the existing community. See figure 21, flood risk areas do not have a significant impact on the settlement.

6.48 In terms of Natural Flood Management opportunities perhaps the main opportunities relate to reducing runoff on the Hill of Cally. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer

Figure 21 Bridge of Cally Flood risk map



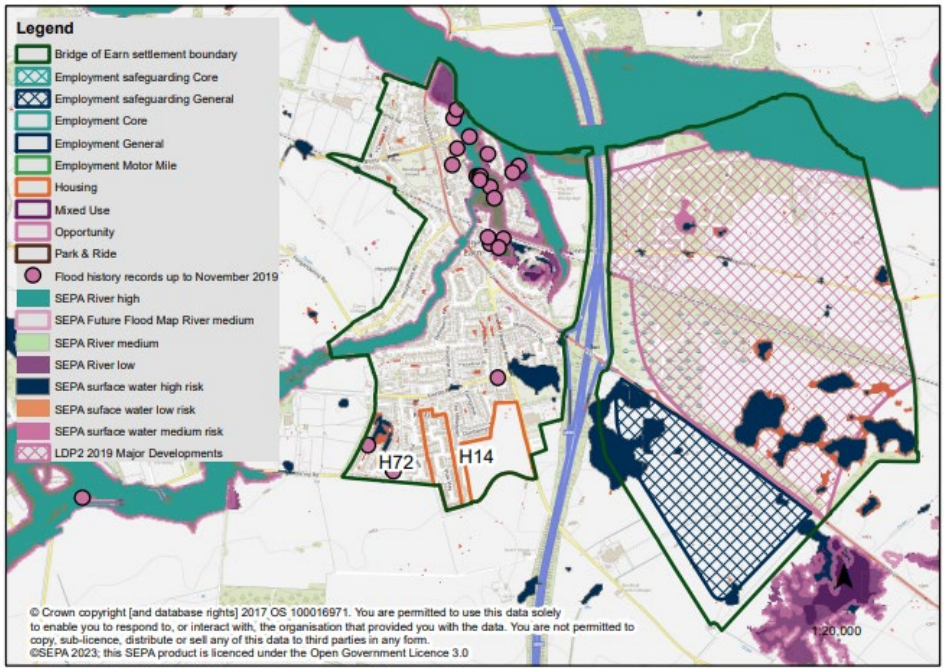
Bridge of Earn and Oudenarde

6.49 Bridge of Earn and Oudenarde lies within a PVA due to flood risk to Bridge of Earn. The main source of flooding is river flooding from the River Earn, Deich Burn and Yellow Burn. A flood protection scheme offers some protection against flooding in this area. There is also risk of surface water flooding. There is history of flooding in this area, with recent flooding recorded in 2015, 2016, and 2020. There are approximately 290 people and 150 homes and businesses at risk from flooding. There is a long record of flooding in this area. The town was affected by flooding in February 1990 and January 1993. In December 2015, Storm Desmond caused prolonged rainfall across Perth & Kinross, affecting several properties in Bridge of Earn. In June 2016 intense rainfall caused flooding to homes, roads, and a local school. In August 2020, heavy rain flooded one property and some roads. Flooding occurred in September 2022 when surface water flooding affected four properties. Also the flood event October 8th 2023 caused internal flooding of 5 properties.

6.50 Bridge of Earn and Oudenarde are part of the Tier 1 Perth Core Area. The area has been identified for significant expansion. LDP2 H14 and H72 to the southwest are not affected by flood risk. The areas of flood risk more significantly affect the existing settlement, than future development areas. However, there are areas of flood risk shown within Oudenarde (major development area on figure 22) to the north associated to the River Earn, and to the south there are some surface water flood risk areas.

6.51 Within the overall Oudenarde 02/01482/IPM permission in principle permission for residential, commercial and industrial development with associated school provision, open space and landscaping, the approved masterplan, indicated at risk areas are proposed for riverside public open space. The detailed masterplanning of this area has still to come forward through detailed planning application/s where flood risk will be considered in more detail. With regard to the southern residential part of Oudenarde it secured detailed permission through planning application 16/02156/AMM for 159 homes. Drainage calculations were submitted as part of this application that included an assessment of the 200 year return period including 20% for climate change. The drainage calculations show that the proposed development site is not at risk of surface flooding up to this design standard. What it did show was that other undeveloped phases of the Oudenarde site were at risk of some surface water flooding. Evidence was provided by the applicant confirming attenuation within the surface water design of the undeveloped phases of Oudenarde can mitigate this flood risk.

Figure 22 Bridge of Earn and Oudenarde Flood risk map



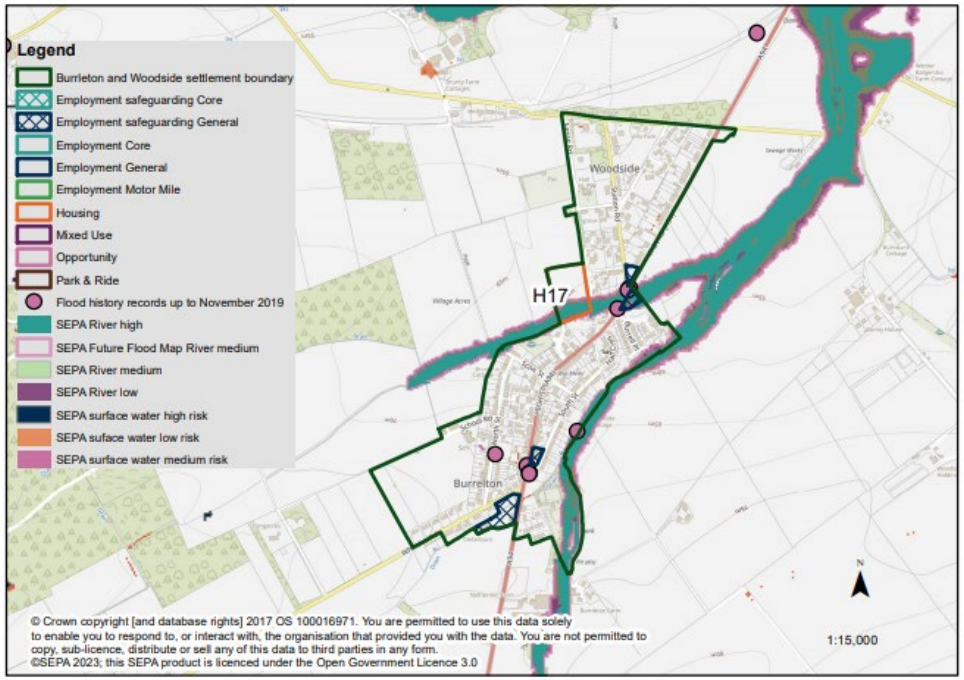
6.52 In terms of Natural Flood Management opportunities, there are very good opportunities for floodplain storage associated to the River Earn and surface water retention opportunities within the settlement. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Burrelton and Woodside

6.53 Burrelton and Woodside does not lie within a PVA. To date there has been some flood history associated to the area, and at risk areas affect the developable area within the LDP2 H17 allocation for housing, see figure 23. October 17th 2023 also resulted in solum flooding of a property at Woodside. The H17 site gained an in principle permission through planning application 22/00951/IPL for residential development. The permission is conditioned to require an updated Flood Risk Assessment and Drainage Impact Assessment taking into account the final design of the development when the detailed application comes forward. It is also conditioned to prevent development within the functional floodplain.

6.54 In terms of Natural Flood Management opportunities, the best opportunities related to floodplain storage to the Coupar Bunn to the north. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

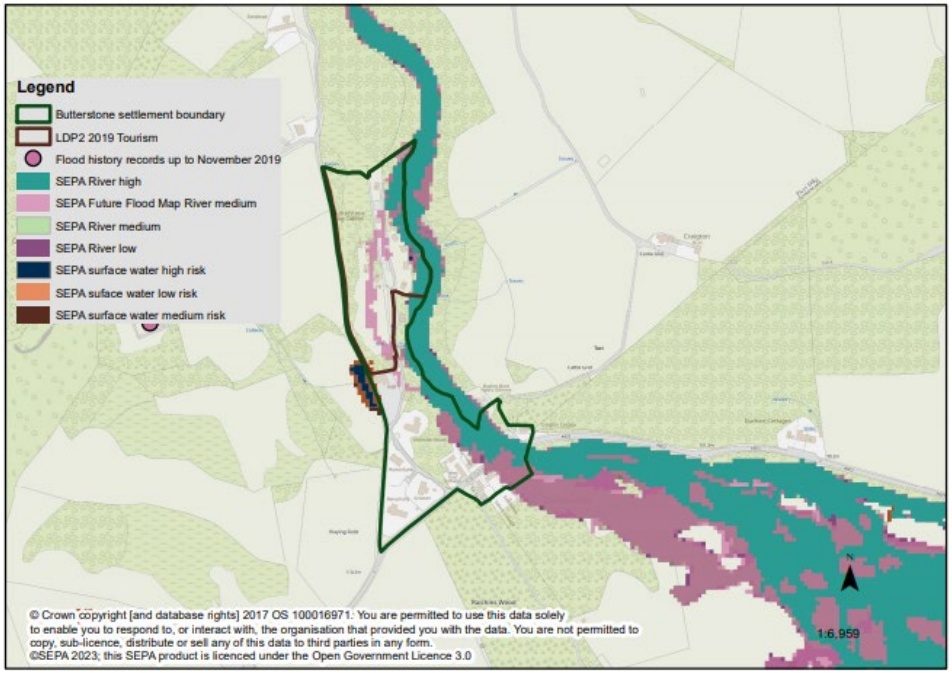
Figure 23 Burrelton and Woodside Flood risk map



Butterstone

6.55 Butterstone does not lie within a PVA. The settlement boundary of Butterstone includes holiday accommodation to the north of the village. To date there is no recorded flood history associated to the settlement. However, see in figure 24, the existing community, and its opportunities for growth within the settlement is significantly constrained by flood risk.

Figure 24 Butterstone Flood risk

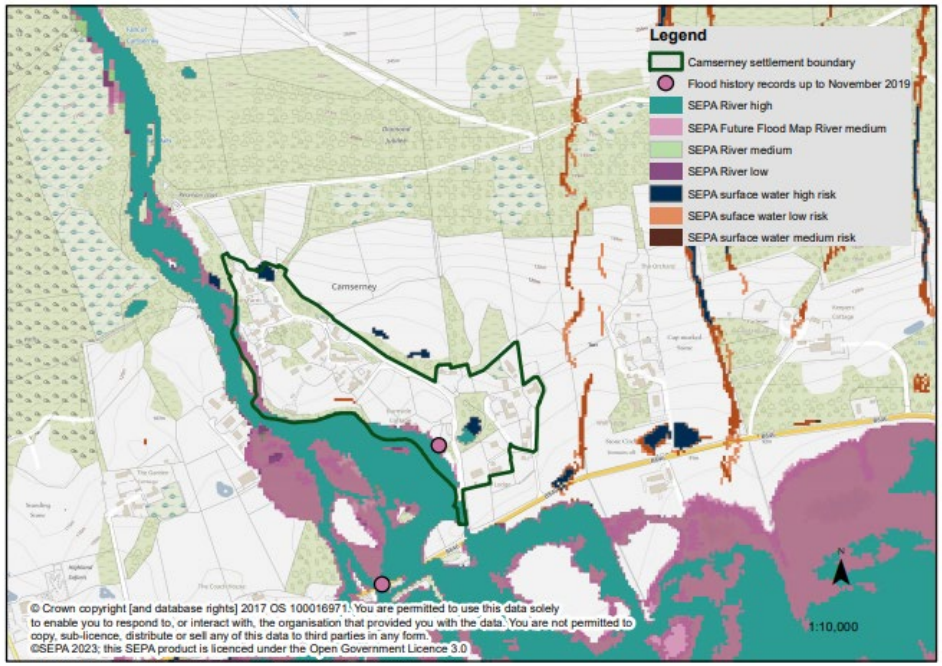


6.56 In terms of Natural Flood Management opportunities the most significant local opportunities related to the Lunan Burn where there are good floodplain storage and there are areas of high deposition and erosion which could be reduced. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Camserney

6.57 Camserney does not lie within a PVA. Camserney has a fairly dispersed building pattern, and the settlement boundary has been drawn to offer scope for some small scale infill development, and the areas of flood risk have a limited impact on the settlement (see figure 25). A property was threatened due to a culvert at capacity on the 12th of December 2017. Also post November 2019 so not on the mapping, the flood event October 8th, 2023, caused internal flooding of 3 properties.

Figure 25 Camserney Flood risk map

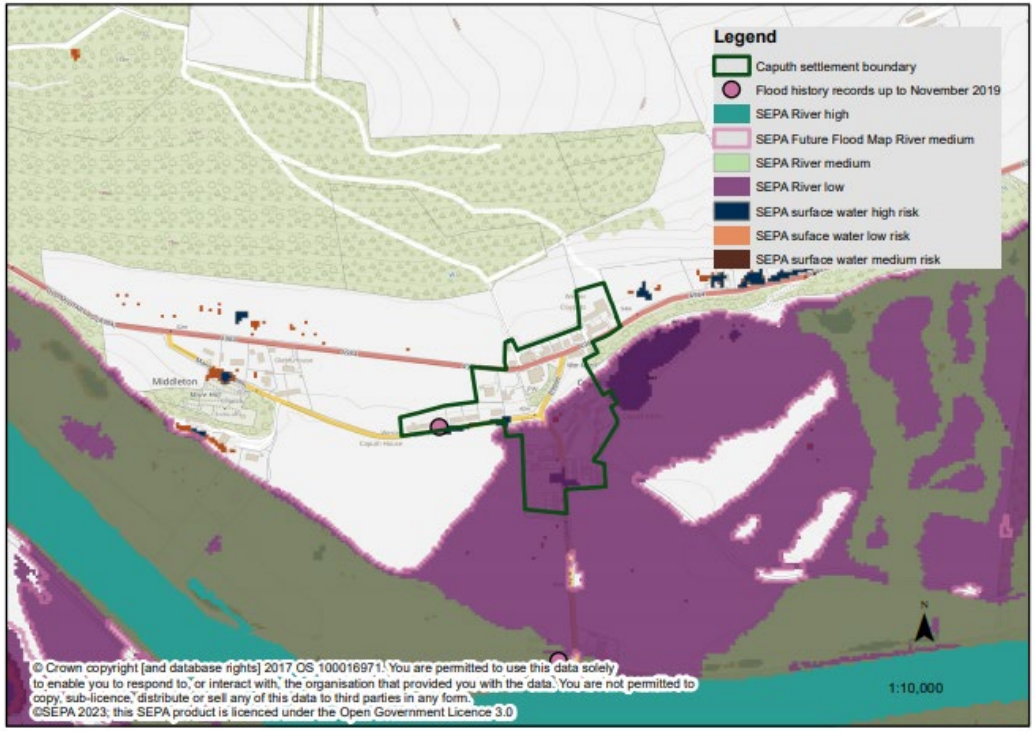


6.58 In terms of Natural Flood Management opportunities there are really significant opportunities for floodplain storage and for runoff reduction close to Camserney. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Caputh

6.59 Caputh lies within the Dunkeld and Birnam PVA. there has been significant flood history associated to Caputh, with massive out of bank flooding in1993 where the main River Tay avulsed (moved into a new main channel via erosion) on the floodplain located on the side of Caputh village. This is also reflected in the river flood risk mapping, see in Figure 26. Opportunities for any development on the south side of the village would be limited and would need a detailed modelling study.

Figure 26 Caputh Flood risk



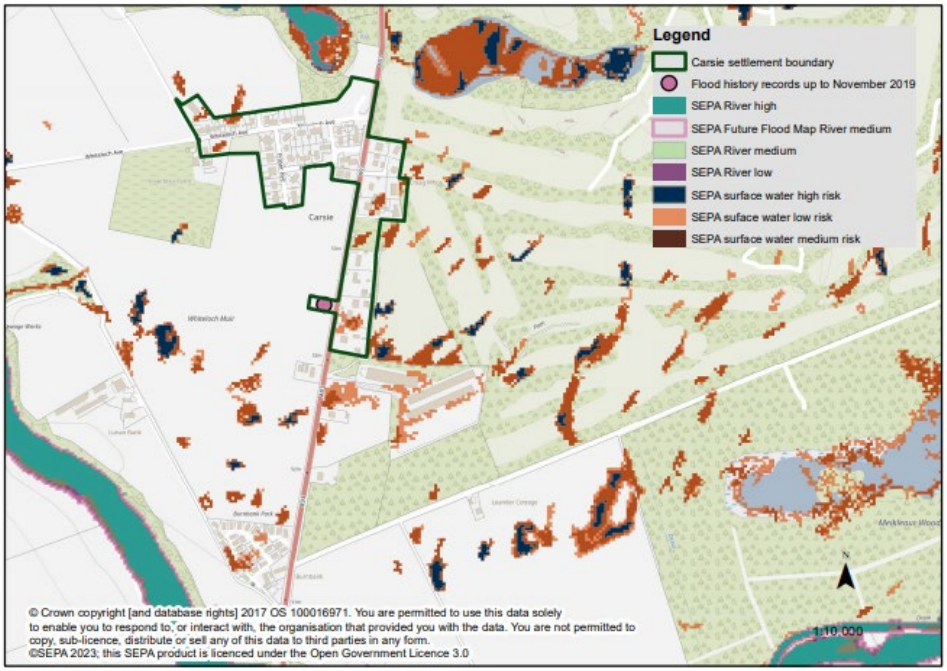
6.60 In terms of Natural Flood Management opportunities there are significant opportunities for floodplain storage nearby and areas of high deposition and erosion associated to the River Tay to the south of Caputh. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Carsie

6.61 Carsie lies within the Blairgowrie and Rattray PVA, but the more significant risks are more associated with elsewhere within this PVA.

6.62 The settlement boundary at Carsie has been drawn to allow for some small-scale infill development to help sustain the existing community. Carsie has some discrete areas affected by surface water flood risk. The existing community and its opportunity for growth is not significantly affected by flood risk. However, a property was flooded on the 4th of October 2017, see figure 27.

Figure 27 Carsie Flood risk map

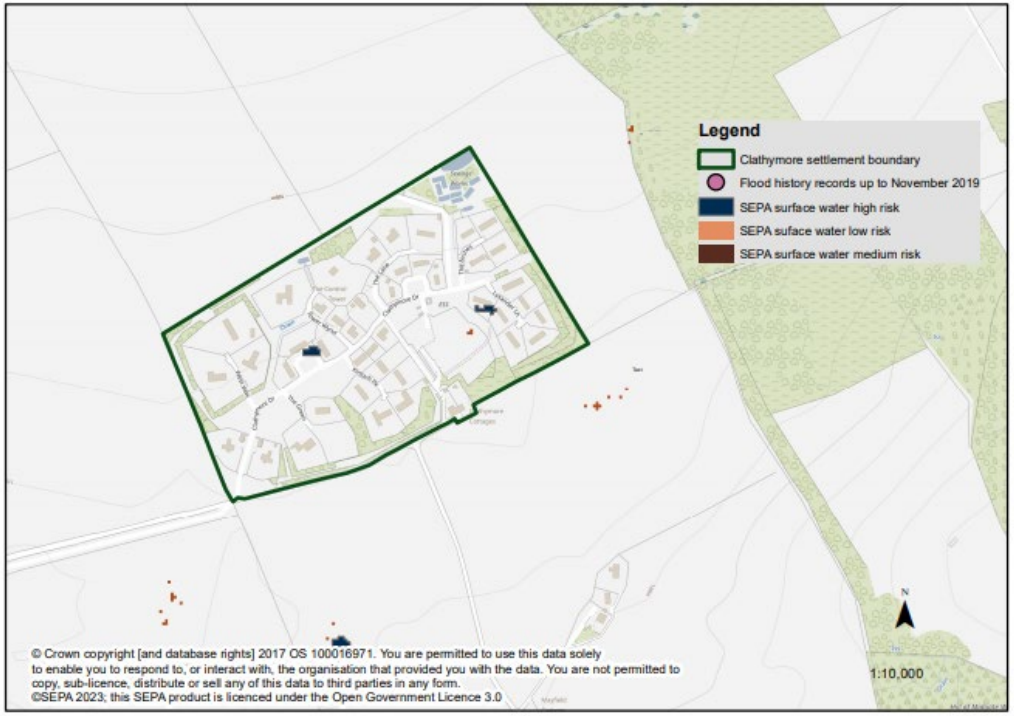


6.63 In terms of Natural Flood Management opportunities there are some opportunities for floodplain storage related to the Lunan Burn to the south, and to reducing an area of high erosion. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Clathymore

6.64 Clathymore does not lie within a PVA. The settlement boundary has been drawn to reflect the existing planning permissions at the site. All development will be required to incorporate SUDS proposals and may require a Drainage Impact Assessment. See in figure 28 the settlement is not significantly affected by flood risk, and there are no flood events recorded.

Figure 28 Clathymore Flood risk



6.65 In terms of Natural Flood Management opportunities there are limited opportunities locally and they relate to reducing run off, and areas of surface water flood risk. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Comrie

6.66 Comrie lies within a PVA. The main source of flooding is the River Earn, River Lednock and the Water of Ruchill. There is also risk of flooding from surface water. There are approximately 191 residential properties and 2 non-residential properties at risk of flooding.

6.67There is a history of flooding with significant floods recorded in 1993, 2015 and 2016 during Storm Frank. There is a long record of flooding in this area. In August 2012, approximately 60 properties in Dalginross were flooded by the Water of Ruchill. In November 2012 the Water of Ruchill flooded again, inundating approximately 150 homes. In January 2016 the fire service was called to attend a localised flooding issue. The most recent flood occurred in February 2021 however no properties were affected.

6.68A Flood Protection Scheme has been designed and construction is expected to commence in 2024 with completion by 2026.

6.69 Flood risk significantly affects the existing community, and future opportunities for growth. The housing allocation LDP2 H58 is shown to have a surface water flood risk, potentially limiting the developable area, and it require a flood risk assessment to support any future planning application, see figure 29 for SEPA flood extents, and figure 30 for the at risk areas from NPF4 policy 22.

Figure 29 Comrie Flood risk map

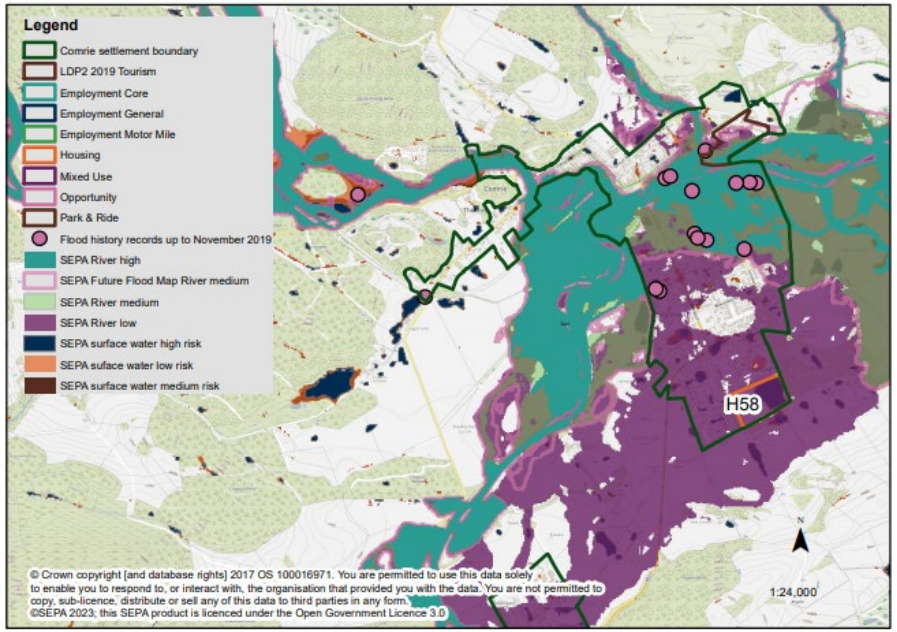
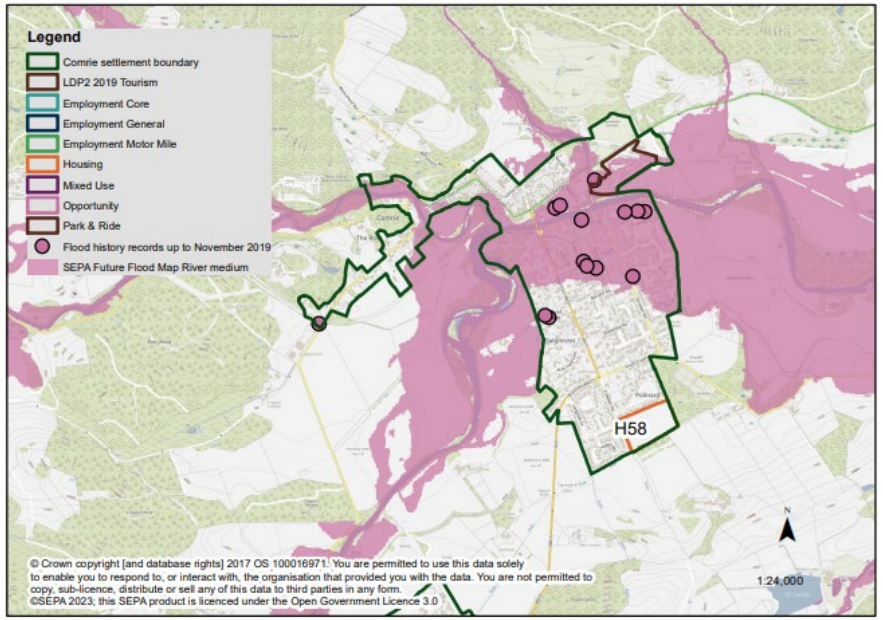


Figure 30 Comrie Flood Risk Map (at risk areas)

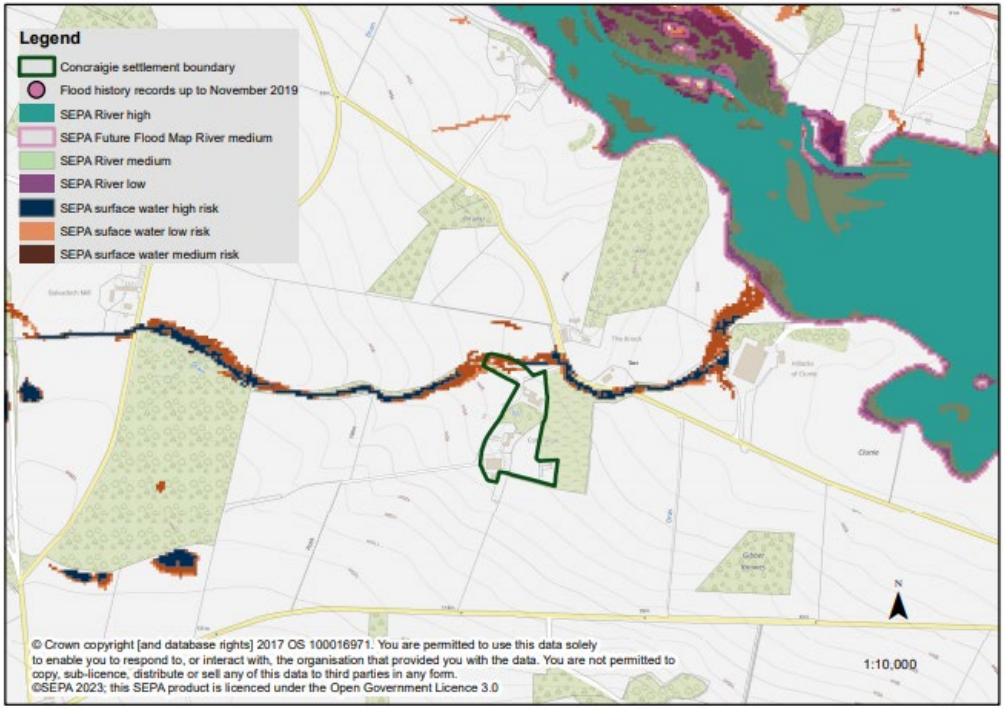


6.70 In terms of Natural Flood Management opportunities there are a lot of opportunities locally. There are excellent floodplain storage opportunities associated to the River Earn to the east, and runoff reduction opportunities to the northwest of Comrie. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Concraigie

6.71 Concraigie lies within Blairgowrie and Rattray PVA, but the more significant risks are more associated with elsewhere within this PVA. To date there has been no recorded flood history associated to the settlement, and there is some surface flood risk at the northern end of the settlement, see figure 31.

Figure 31 Concraigie Flood risk

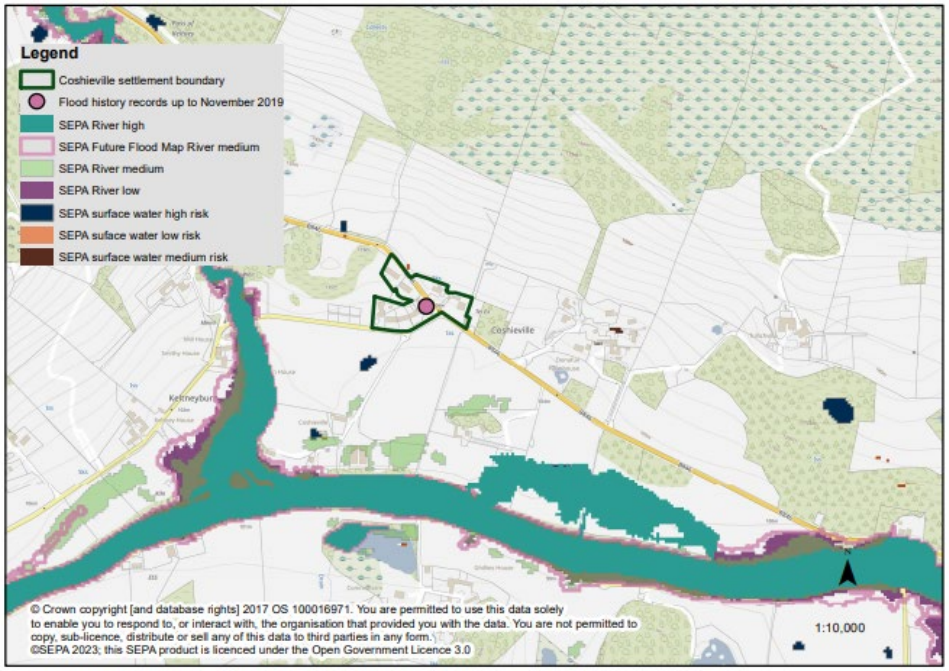


6.72 In terms of Natural Flood Management opportunities there are significant floodplain storage and surface water flood risk opportunities associated to the Lunan Burn to the North. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Coshieville

6.73 Coshieville does not lie within a PVA. To date there has been a limited flood history, with a flood record for flooded gardens due to a blocked drain on 7th January 2007, see figure 32.

Figure 32 Coshieville Flood risk

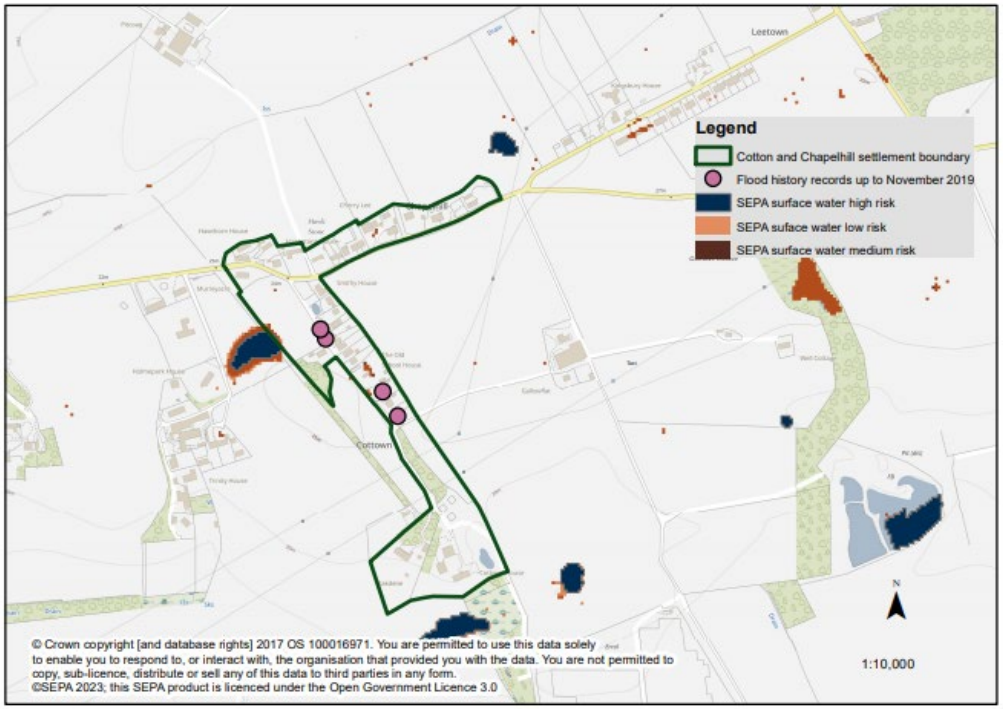


6.74 In terms of Natural Flood Management opportunities the main opportunities close to Coshieville are to reduce areas for runoff, and to provide floodplain storage. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Cotton and Chapelhill

6.75 Cottom and Chapelhill does not lie within a PVA. The settlement boundary has been drawn to create an opportunity for small-scale development on the north-west edge, but there are no allocations identified. There are some flood risk records for property level flooding which could affect development potential within this area, see figure 33.

Figure 33 Cotton and Chapelhill Flood risk



6.76 In terms of Natural Flood Management opportunities there is some opportunity areas for wave dissipation to the south, and some floodplain storage opportunities to the north and west. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Coupar Angus

6.77 Coupar Angus lies within a PVA. The main source of flooding is the Coupar Burn. A local detailed flood study undertaken by Perth and Kinross Council indicates that there are approximately 30 homes and businesses currently at risk of flooding. There is a long history of flooding in this area from the Coupar Burn including flooding in August 2004 and December 2012, when several homes and businesses flooded from Coupar Burn. In December 2015, Storm Frank caused prolonged rainfall across Perth & Kinross. Several roads were affected in the Coupar Angus area. Flooding on the Coupar Burn occurred in February 2021 and November 2022 but there is no record of properties being affected. Also, on October 8th, 2023, there were 2 properties internally flooded on Coupar Grange, and garden flooding on George Street. On October 19th, 2023, 2 properties on Pleasance Road were internally flooded.

6.78 The national assessment for river flooding is improved by the Coupar Burn Flood Study completed in 2016 and the SEPA modelling study to improve flood maps in the area. The study concluded that structural actions such as a flood protection scheme were not economically viable. With significant areas therefore remaining at risk of flooding, and extensive flood event record history, flooding is a substantial threat to existing community and constraint on future development. The LDP2 E32 employment allocation, was identified as a site requiring flood risk assessment, and is subject to a current planning application. When determined, this decision will inform the Proposed Plan. Please see figure 34 for the SEPA flood risk extents, and figure 35 for the at risk areas as per NPF4 policy 22 Flood risk.

Figure 34 Coupar Angus Flood risk map

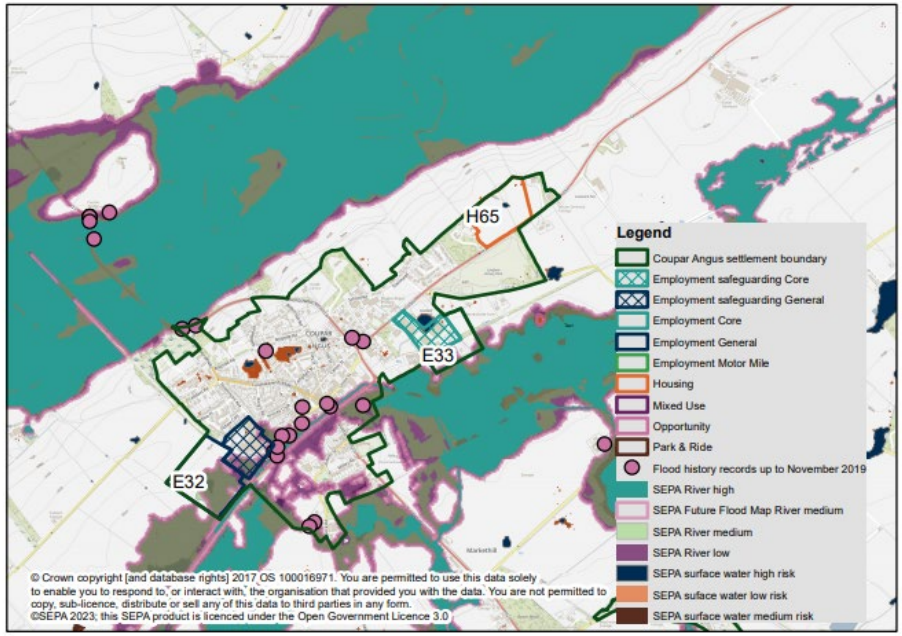
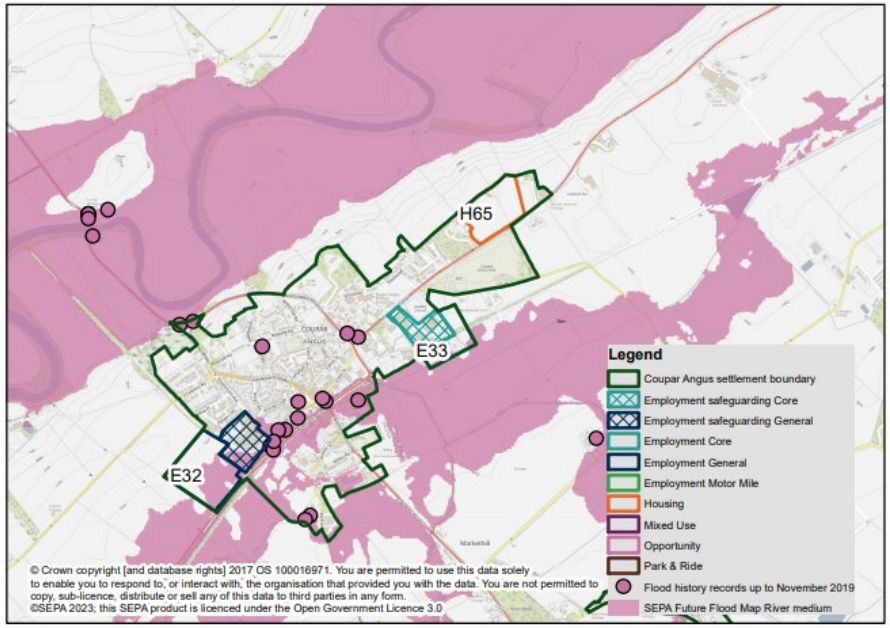


Figure 35 Coupar Angus Flood risk map (at risk area)

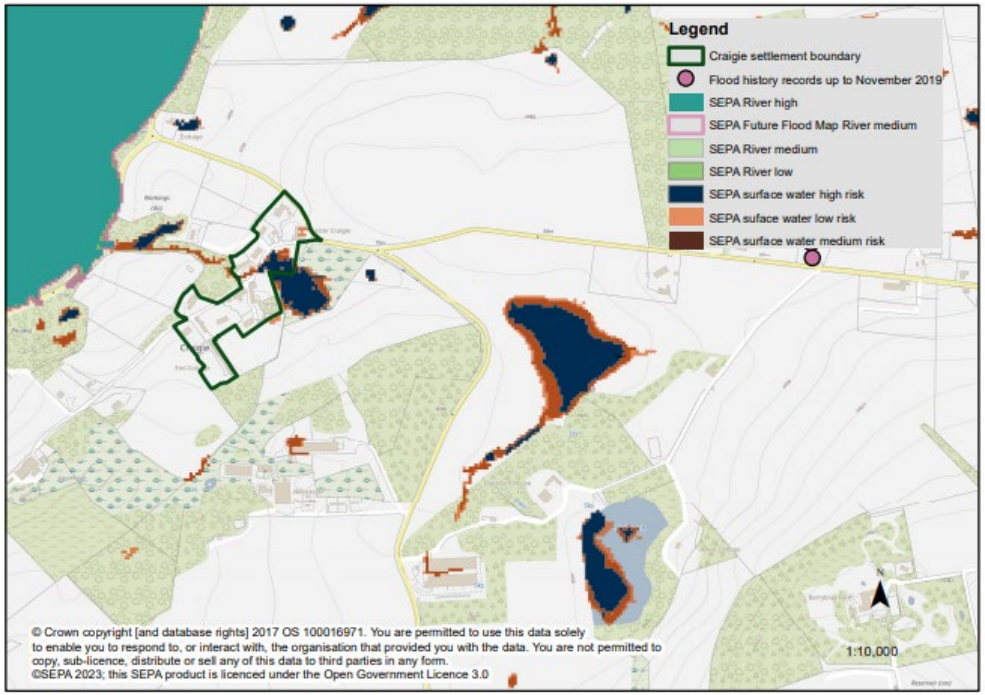


6.79 In terms of Natural Flood Management opportunities there is high deposition on the Coupar Burn and reducing deposition rates could have a consequential benefit on maintaining conveyance capacity, and big areas of floodplain storage potential and surface water flood risk associated to the Coupar Burn to the South, and River Isla to the North. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Craigie

6.80 Craigie does lie within The Blairgowrie/Rattray PVA but the more significant risks are more associated with elsewhere within this PVA. The settlement boundary has been drawn to allow for limited infill development. To date there has been no recorded flood history for Cragie, and there is some surface water flood risk within and adjacent to the settlement, see figure 36.

Figure 36 Craigie Flood risk

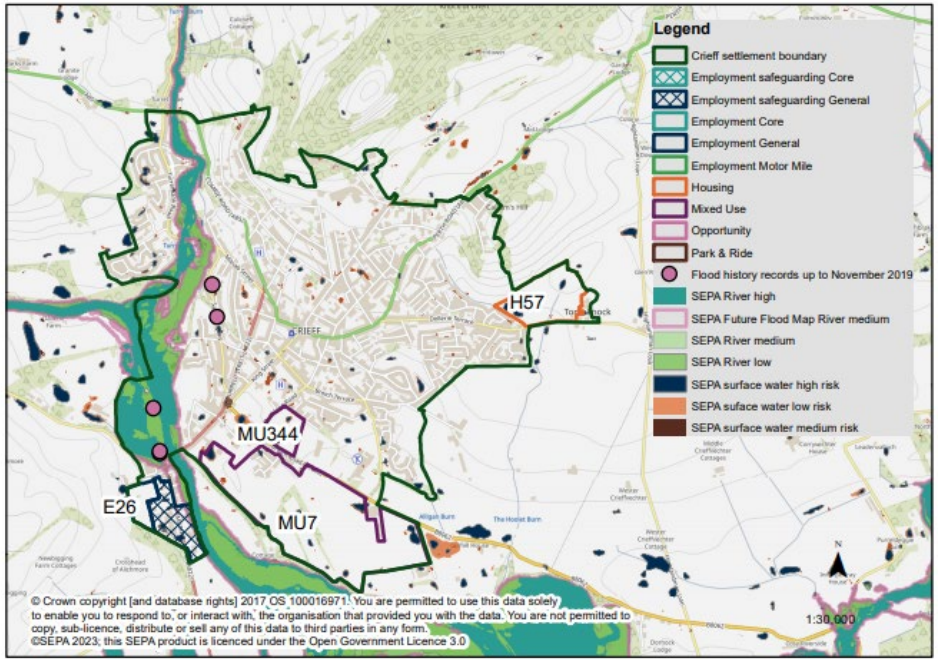


6.81 In terms of Natural Flood Management opportunities there are opportunities for floodplain storage and for reducing deposition and erosion of the Lunan Burn to the North. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Crieff

6.82 Crieff does not lie within a PVA. To date there has been fairly limited recorded flood history within the settlement, see on figure 37. Also, as a whole the existing community and the LDP2 development allocations are not significantly impacted by flood risk, although FRAs are required to inform H57, MU7, and E26 as/when they come forward as planning applications.

Figure 37 Crieff Flood risk

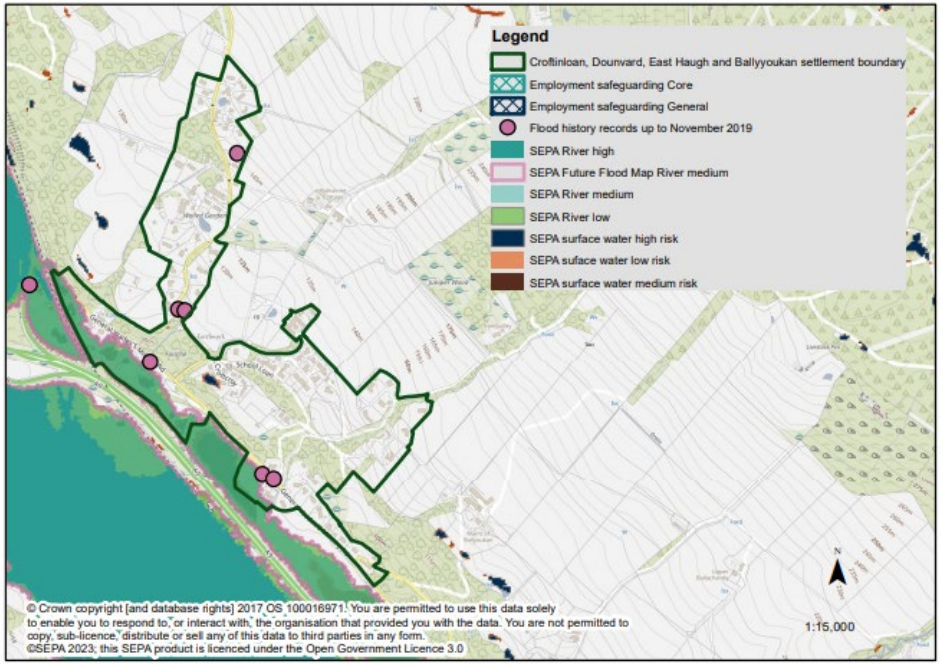


6.83 In terms of Natural Flood Management opportunities there are significant opportunities related to the River Earn, to reducing erosion (outwith the Crieff boundary) and deposition (within Crieff), and also some opportunities to reduce runoff nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Croftinloan, Donavourd, East Haugh and Ballyoukan

6.84 Croftinloan, Donavourd, East Haugh and Ballyoukan lies partially within the Pitlochry PVA, however other parts of the PVA are more significantly affected by flood risk. Croftinloan, Donavourd, East Haugh and Ballyoukan are closely related and to reflect this they have been grouped together under a single settlement boundary and have limited scope for infill development with significant areas of green spaces being protected to retain the character of these communities. SEPA flood risk mapping largely shows impacts on the southern edges, whilst there is some surface water flood risk, and there are some flood event records relating to surface water street level flooding and property level flooded gardens, see figure 38.

Figure 38 Croftinloan, Donavourd, East Haugh and Ballyoukan Flood risk



6.85 In terms of Natural Flood Management opportunities there are significant opportunities to reduce deposition on the River Tummel, and reduce erosion on the Lochbroom burn to the south, and for floodplain storage on River Tummel, to the south of the settlement. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

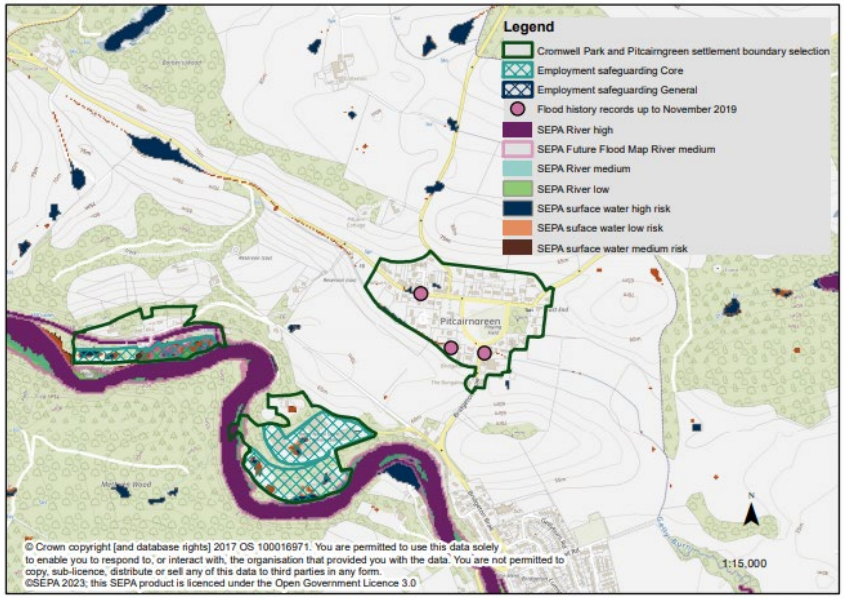
Cromwell Park and Pitncairngreen

6.86 Cromwell Park and Pitncairngreen lies within the Perth and Almondbank PVA, but it is not as significantly affected as other parts of this PVA. Within Pitcairngreen there are 3 flood events recorded for sewer, surface water, and then fluvial from the Gelly Burn. The fluvial flooded a carpark and a playing field due to a blocked culvert, whereas the surface water and sewer flooding both resulted in a property being flooded each.

6.87 Cromwell Park has been identified as being able to accommodate some limited future growth in order to encourage the redevelopment of brownfield land, and it is noted that flood risk does cover some of the land safeguarded for employment uses. Whereas Pitcairngreen is an estate village and its settlement boundary was drawn tightly with limited potential for future expansion. You can see how the SEPA flood extents affect the settlements in figure 39.

6.88 In terms of Natural Flood Management opportunities it is limited, but there are areas of surface water flood risk may have potential for Natural Flood Management. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 39 Cromwell Park and Pitncairngreen Flood risk



Cultybraggan

6.89 Cultybragan does not lie within a PVA. Cultybraggan Camp is a former army camp facility. Ownership of this site was transferred to a Community Trust in 2007 and the focus is for the development of community and employment uses. Planning permission has already been granted for various uses and there is significant potential for sustainable economic growth in this rural area. There is flood risk areas which impact on the settlement, see figure 40, and in terms of the at risk areas defined in NPF4 which are shown on figure 41, there is no impact on land within the settlement boundary.

6.90 In terms of Natural Flood Management opportunities there are significant opportunities to reduce runoff from Ben Halton and Glen Artney to the west. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 40 Cultybraggan Flood risk

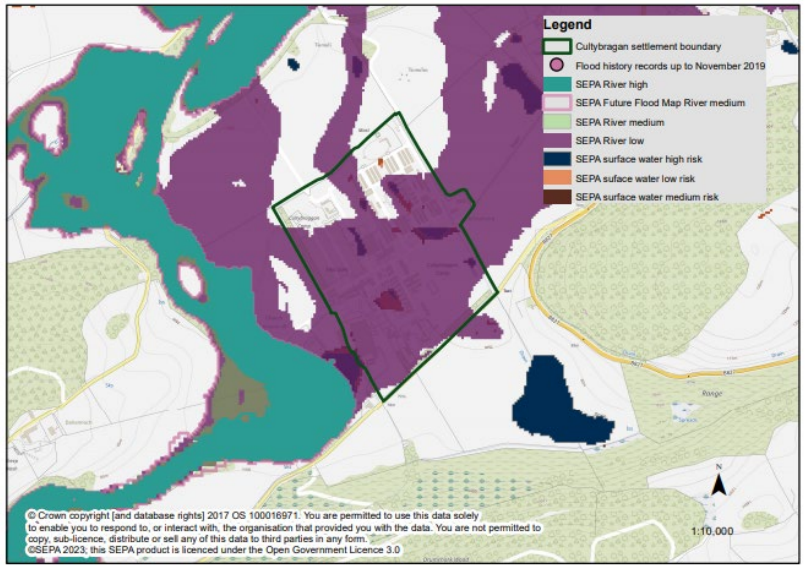
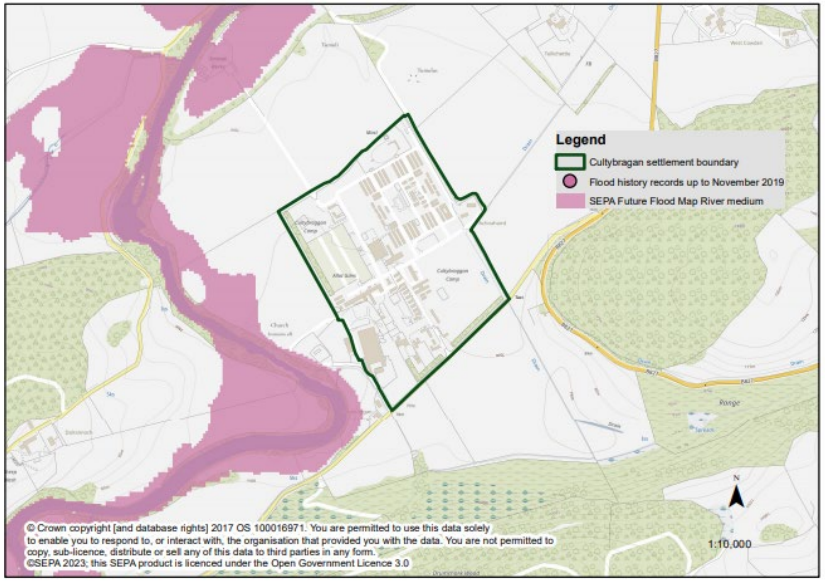


Figure 41 Cultybraggan Flood risk (at risk area)



Dalcrue

6.91 Dalcrue lies within the Perth and Almondbank PVA but is not as significantly affected as other parts of this PVA with no recorded flood events noted. Dalcrue has a number of small, specialist employment uses and a site has been identified to support limited growth for compatible uses. Dalcrue is constrained by flood risk from the River Almond and surface water flood risk (see figure 42 and 43). It is noted that the NPF4 at risk areas may affect developable areas within Dalcrue, and there is a developer requirement for an FRA for LDP2 E9.

6.92 In terms of Natural Flood Management opportunities there are not a lot of major opportunities however there are significant areas of surface water flood risk so this may represent an opportunity, which overlaps with a smaller area of floodplain storage potential. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 42 Dalcrue Flood risk

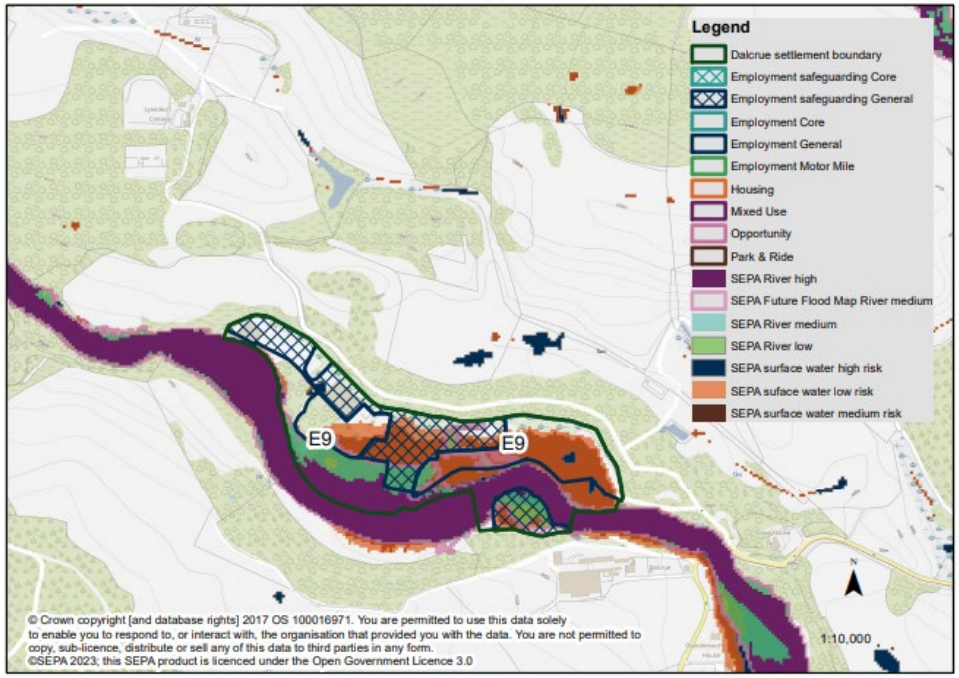
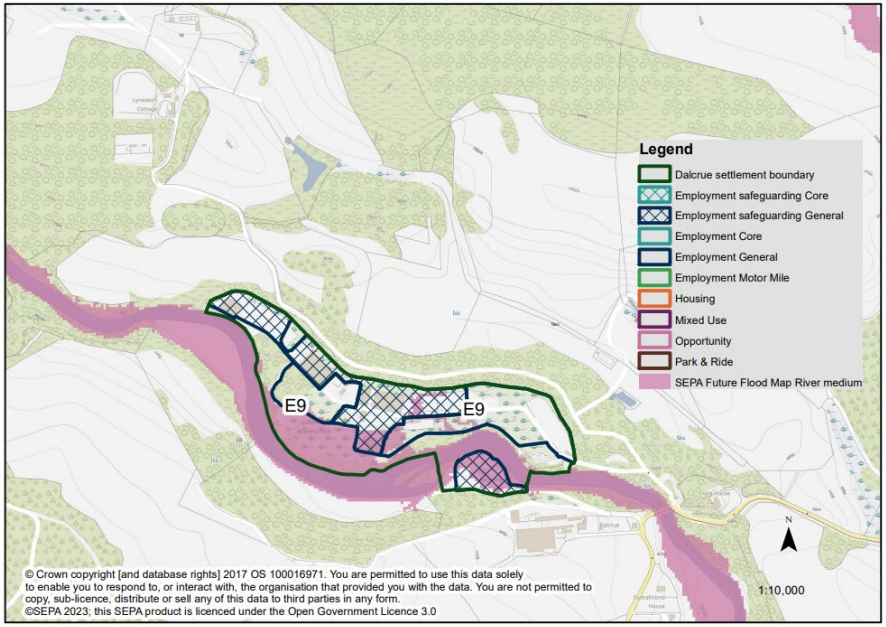


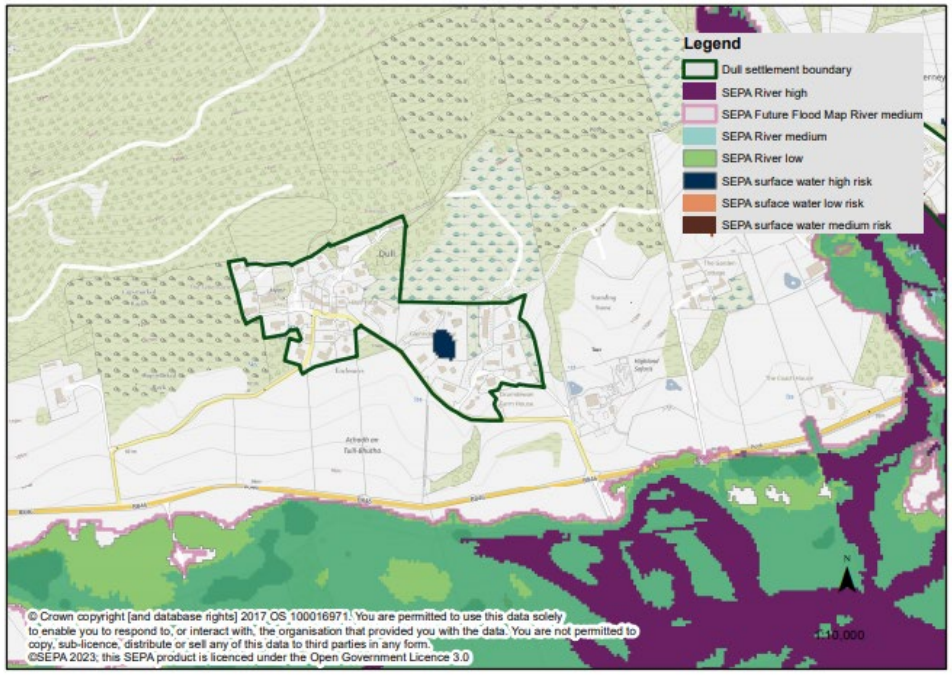
Figure 43 Dalcrue Flood risk map (at risk area)



Dull

6.93 Dull does not lie within a PVA, and there have been no recorded flood events. The settlement boundary has been drawn to offer scope for some further small-scale infill development. There is an area of surface water flood risk at the eastern end (see figure 44), but it is not significantly impacted by flood risk.

Figure 44 Dull Flood risk



6.94 In terms of Natural Flood Management opportunities, the main opportunity is to the south associated to the River Tay for floodplain storage where there is a significant area of high opportunity. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

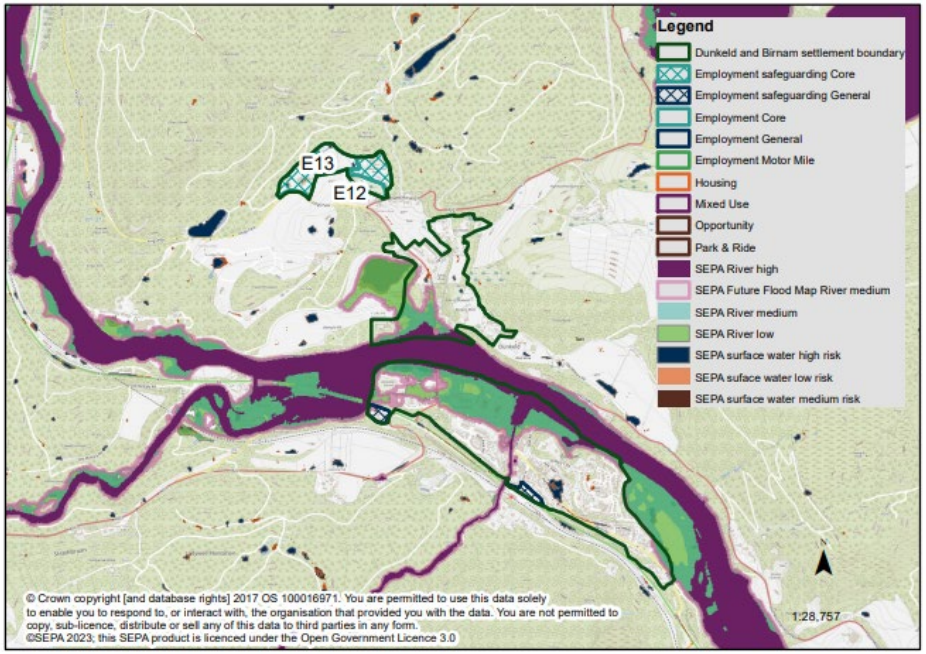
Dunkeld and Birnam

6.95 Dunkeld & Birnam lies within the Dunkeld & Birnam PVA where there are approximately 104 homes and businesses currently at risk of flooding. This PVA has been exposed to significant weather events. During the January 1993 flood there was some flooding at Atholl Gardens. The floodwaters affecting this development were from the small watercourse that flows between the development and Atholl Street. This flood event also affected Burnmouth Road, Birnam which is located immediately upstream of the confluence of the Inchewan Burn and River Tay. Also in February 2018, August 2020 and February 2021 flood events affected Bankfoot and Dunkeld. However, only a small number of properties were affected.

6.96 The towns of Dunkeld and Birnam are located on opposite banks of the River Tay. Dunkeld and Birnam are identified together in TAYplan as a Tier 3 Principal Settlement. However, the potential for additional development is constrained by potential flooding (see figure 45). Scottish Water has delivered two assessments of flood risk within the Bankfoot and Dunkeld sewer catchments. Whilst the Council's study has involved the completion of existing investigations by previous consulting engineers, Mouchel, into the flooding on Atholl Gardens and Atholl Street, Dunkeld from the Spoutwells Burn and another small watercourse. The flood study identified a viable option that provides flood protection for Dunkeld in the vicinity of Sawmill Brae, Spoutwells Burn and the town centre. The funding has been provided in budget approved by Full Committee. The Proposed Plan will consider how committed flood defences will impact on the at risk areas defined by NPF4.

6.97 The Pass of Birnam to Tay Crossing section forms 8.4km of the overall A9 Dualling Programme. Now that a preferred route option has been selected for the section, Transport Scotland's technical advisor, Jacobs, will take forward the development and assessment of the route as part of the Design Manual for Roads and Bridges (DMRB) Stage 3 Assessment. Any additional assessment of flood risk needed to help inform the design will be carried out as part of statutory processes. A full understanding of the potential construction impacts and effects would only develop with the progression of the design and resulting construction methods. Transport Scotland will complete the statutory process during 2024 for the outstanding three schemes which have received ministerial consent, and the Proposed Plan will need to keep abreast of progress on this project, and the flood risk implications.

Figure 45 Dunkeld and Birnam Flood risk

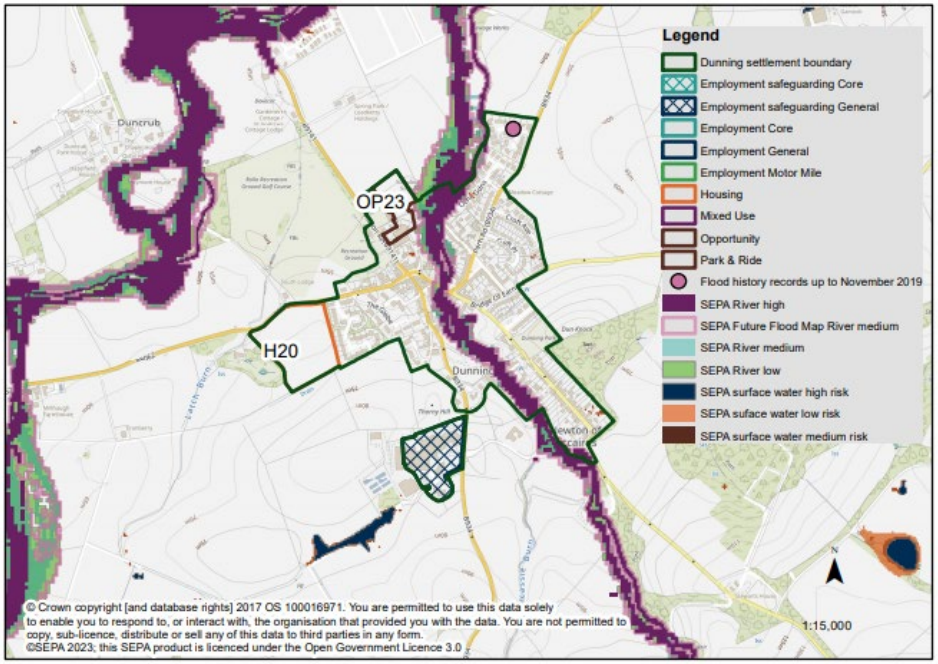


6.98 In terms of Natural Flood Management opportunities there is some runoff reduction opportunity within the settlement and to the east, and some opportunities to address high erosion between Dunkeld and Birnam, and potential Natural Flood Management related to the surface water flood risk to the west of Dunkeld. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Dunning

6.99 Dunning does not lie within a PVA. There is a single flood event record for surface water flooding of Romangate for a flooded road. The existing community and its future growth is somewhat affected by flood risk, from the Dunning Burn, (see on figure 46). There are approximately 40 residential properties at risk of flooding in the Dunning PVA. Widespread out of bank flooding occurred during the storm of August 2020, and approximately 11 properties were affected in Dunning. LDP2 H20 requires a FRA, whilst OP3 does not (but lies close to an at risk area) and so this will be considered in LDP3.

Figure 46 Dunning Flood risk

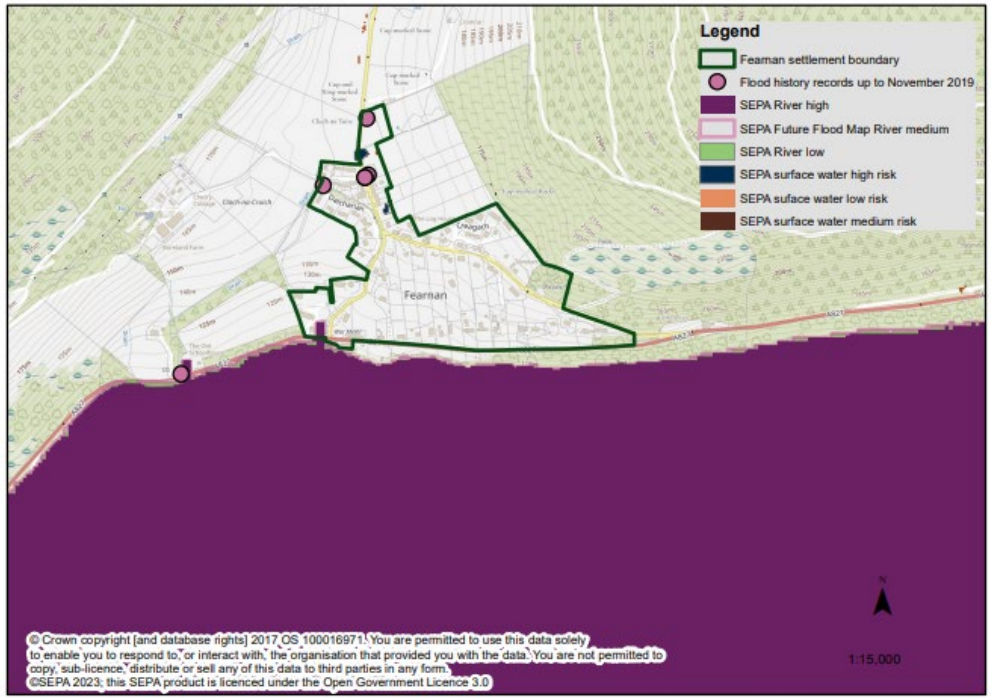


6.100 In terms of Natural Flood Management opportunities it is noted there is moderate deposition within Dunkeld, and erosion to the south outwith the settlement, also there are some opportunities for floodplain storage. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Fearnan

6.101 Fearnan does not lie within a PVA. There are some surface water flooding, property records associated to 4th December 2015 and one record from December 13th 2006 where there was a property threatened from a pluvial cause. The village lies on the northern shore of Loch Tay, there is some surface water flood risk, and a small area at the southwestern end of the village has a river flood risk (see figure 47.

Figure 47 Fearnan Flood risk

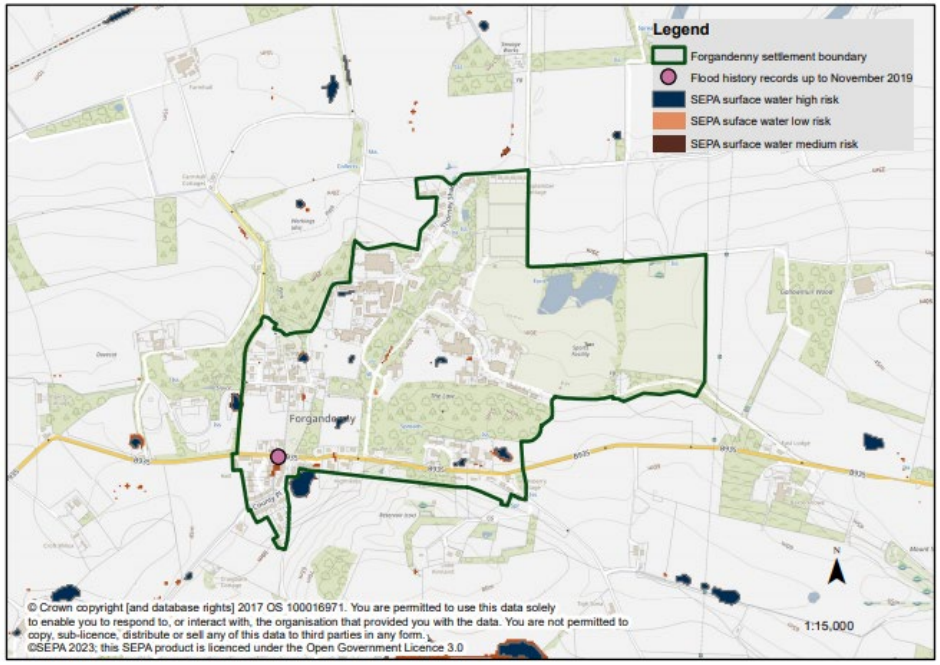


6.102 In terms of Natural Flood Management opportunities, the main opportunities close to the settlement related to runoff reduction. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Forgandenny

6.103 Forgandenny does not lie within a PVA. Widespread surface water flooding occurred during the storm of August 2020, and approximately 11 properties were affected in Forgandenny. Forgandenny is a small settlement close to Perth. The settlement boundary has been drawn to offer the potential to accommodate some further development. In figure 48 there is limited surface water flood risk which affects small parts of the settlement. There was a recorded flood event affecting the Bridge of Earn to Forteviot road at Forgandenny in January 2011.

Figure 48 Forgandenny Flood risk

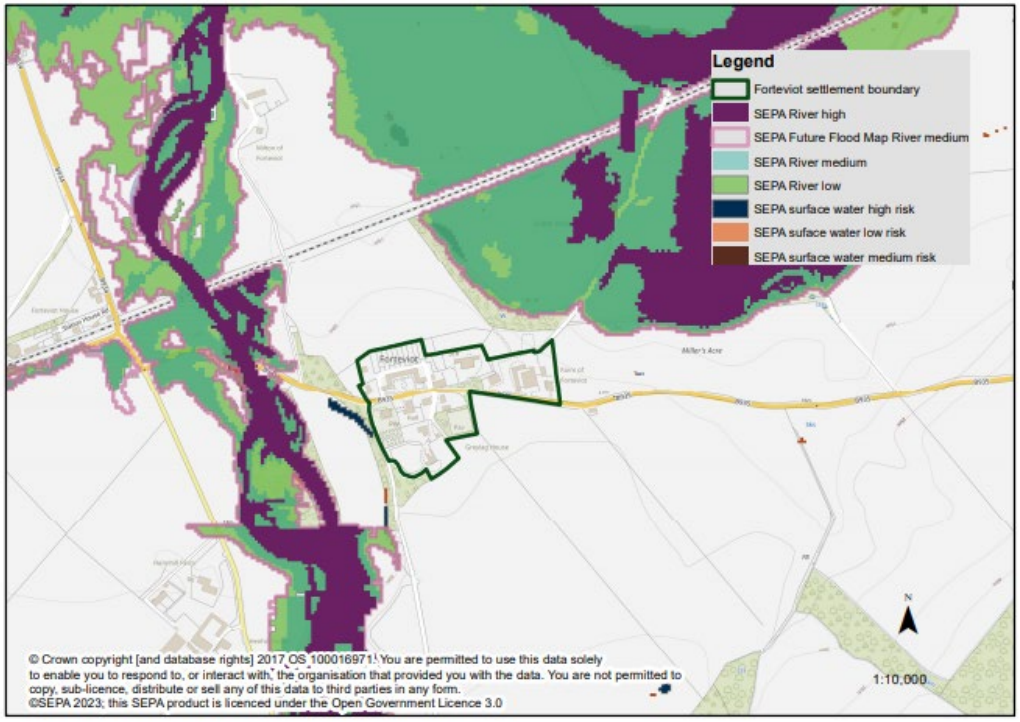


6.104 In terms of Natural Flood Management opportunities, the major opportunities lie to the north associated to the River Earn, with significant sediment management and floodplain storage opportunities there. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Forteviot

6.105 Forteviot does not lie within a PVA. The settlement is not affected by SEPA flood risk mapping, and has no recorded flood events (see figure 49). A tight settlement boundary has been drawn to limit any significant future growth to protect the character and setting of the village.

Figure 49 Forteviot Flood risk

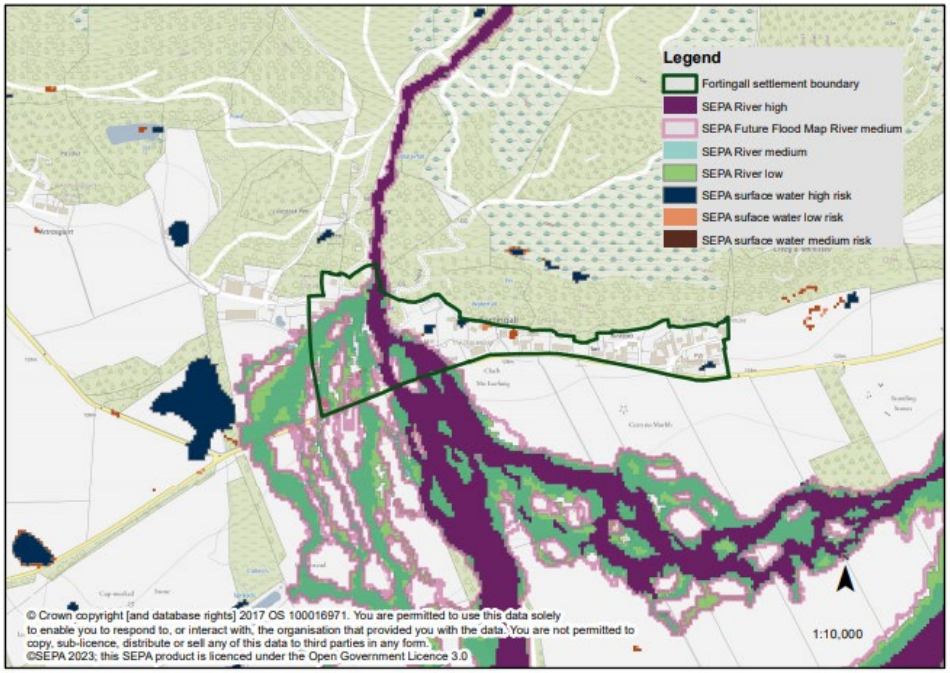


6.106 In terms of Natural Flood Management opportunities there are pretty substantial floodplain storage opportunities associated to the Water of May to the west, and to the River Earn to the North. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Fortingall

6.107 Fortingall does not lie within a PVA. The settlement boundary is drawn to limit future growth to protect the historic character and setting of the village. There is SEPA flood risk associated to the Allt Odhar which affects the western part of the community, but no recorded flood events (see figure 50).

Figure 50 Fortingall Flood risk

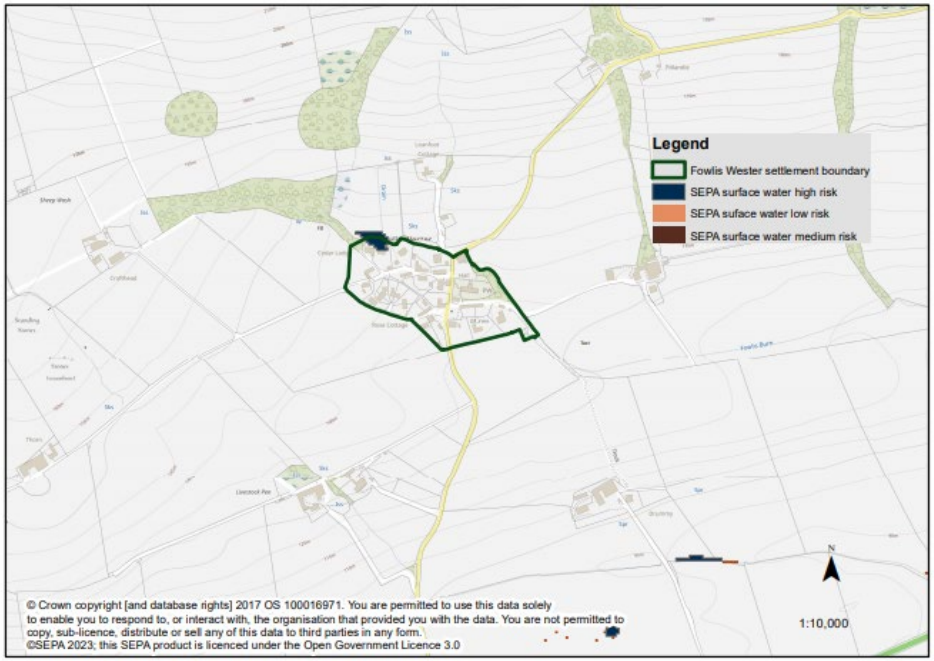


6.108 In terms of Natural Flood Management opportunities there is an opportunity for better sediment management associated to the Allt Odhar, and opportunities for reducing runoff, and for floodplain storage associated to River Lyon. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Fowlis Wester

6.109 Fowlis Wester does not lie within a PVA. The settlement has no services and was not identified for growth. There is a small area to the north of the village which is affected by SEPA surface water flood risk (see figure 51).

Figure 51 Fowlis Wester Flood risk

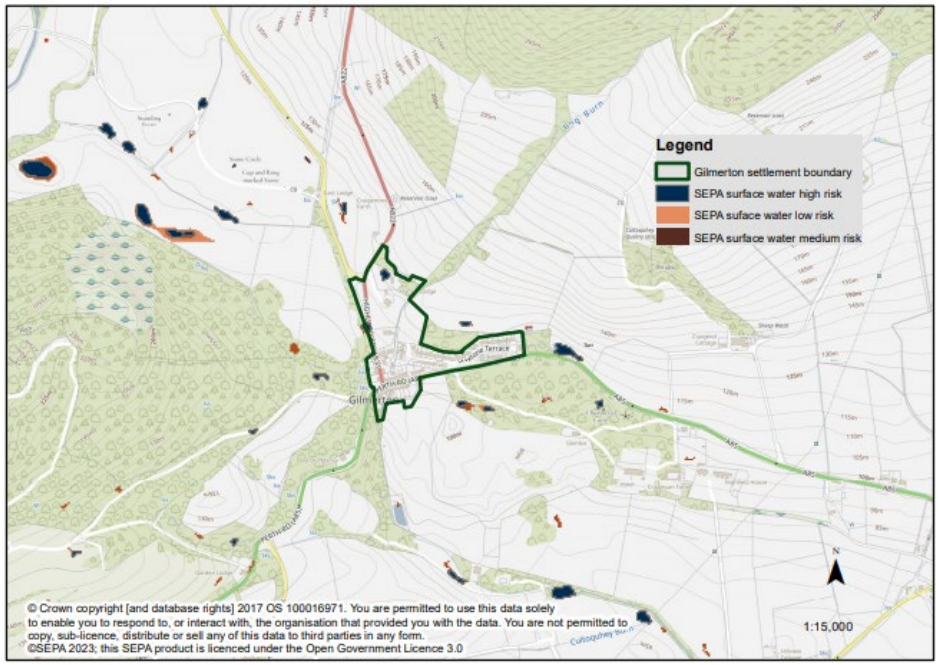


6.110 In terms of Natural Flood Management opportunities, the main opportunities nearby relate to sediment management and reducing surface runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Gilmerton

6.111 Gilmerton does not lie within a PVA. The settlement is affected in small areas by SEPA surface water flood mapping, and there are no recorded flood events up to November 2019 (see figure 52). However there was 7 properties flooded on the Perth Road on 8th of October 2023.

Figure 52 Gilmerton Flood risk

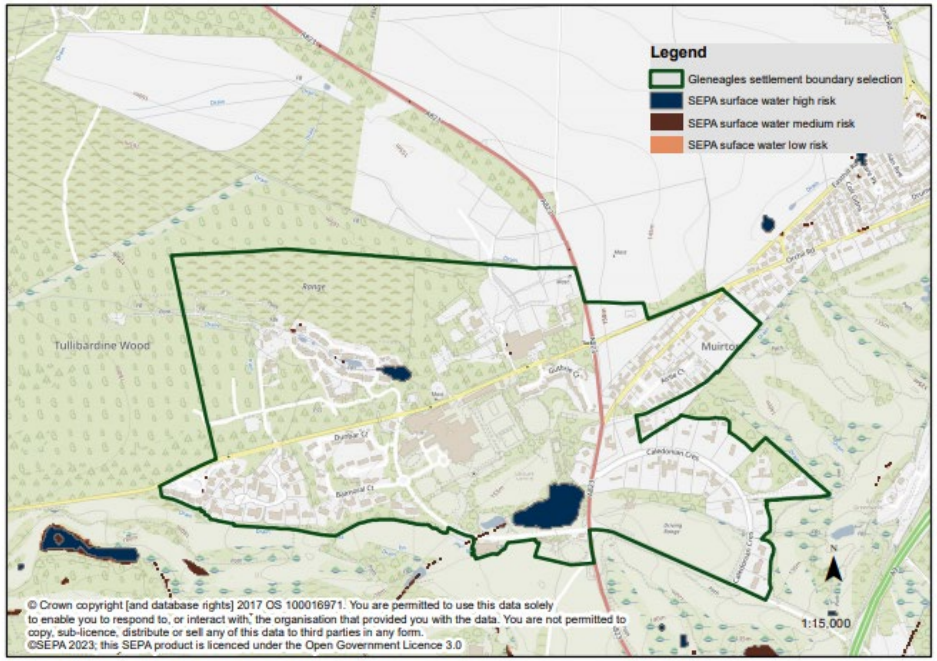


6.112 In terms of Natural Flood Management opportunities, it is noted that to the east there is a sediment management opportunity related to the Muckle burn, and there are some opportunities to reduce surface water runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Gleneagles

6.113 Gleneagles does/not lie within a PVA and there are no recorded flood events, and no further development has been identified in the Plan period (see figure 53).

Figure 53 Gleneagles Flood risk

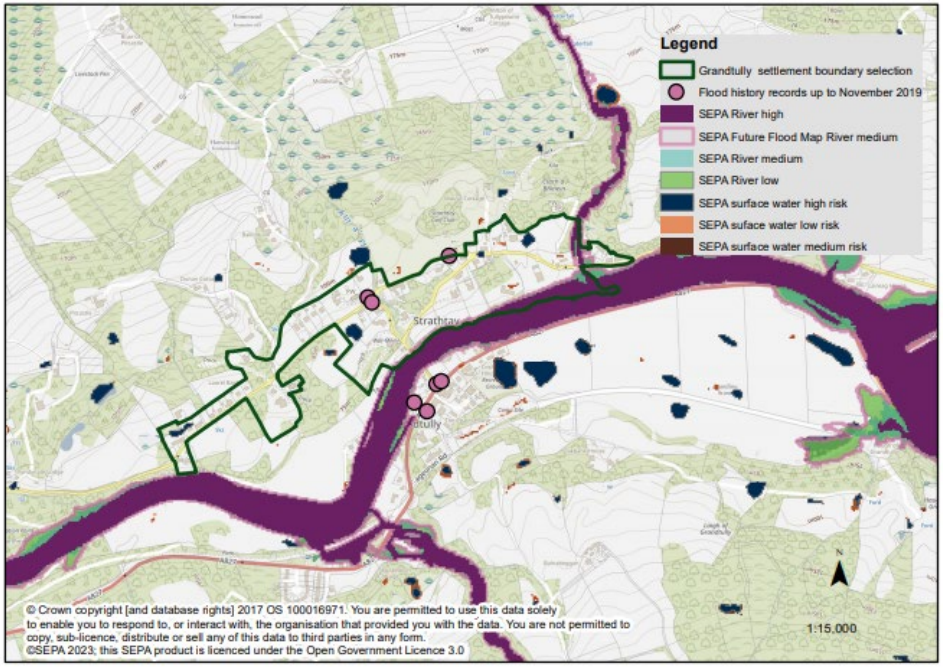


6.114 In terms of Natural Flood Management opportunities there is very little within and nearby. There may be some opportunities related to the areas of surface water flood risk or reducing the runoff area. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Grandtully Strathtay and Little Ballinluig

6.115 Grandtully Strathtay and Little Ballinluig does not lie within a PVA. However there have been various property flood events recorded over the years within the communities. Grandtully and Strathtay are joined by Grandtully Bridge over the River Tay, and parts of these communities are impacted by the River Tay SEPA flood mapping extents, see figure 54.

Figure 54 Grandtully Strathtay and Little Ballinluig Flood risk

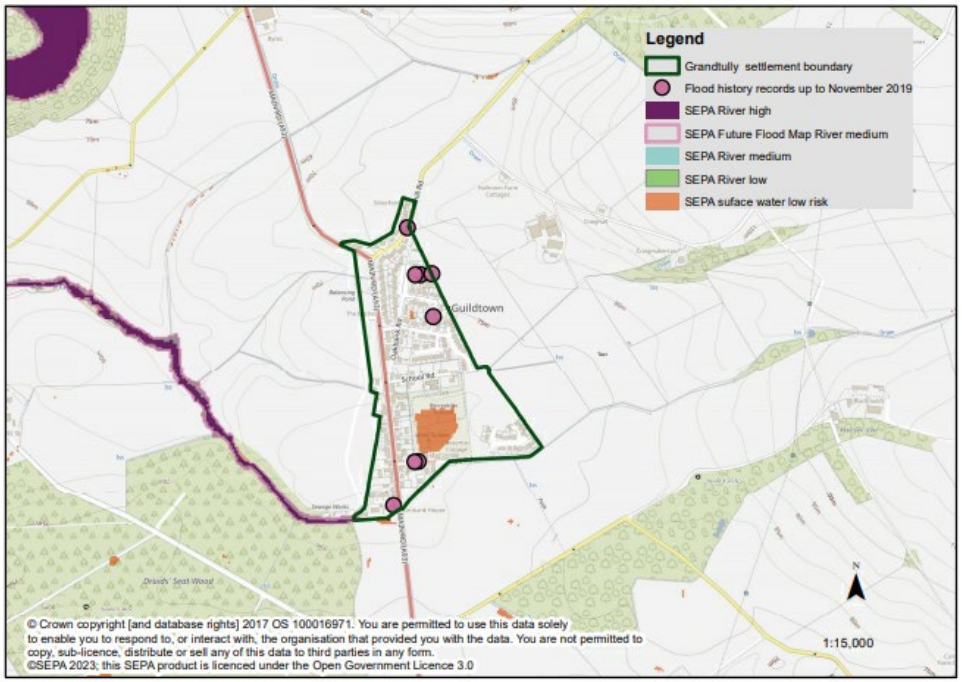


6.116 In terms of Natural Flood Management opportunities, the main opportunities nearby are for floodplain storage, and to reduce runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Guildtown

6.117 Guildtown does not lie within a PVA. The settlement is not significantly affected by flood risk, in terms of the SEPA mapping, with surface flood risk being the most significant impact. However, there are quite a few flood event records as can be seen on figure 55, and they came from various flood events affecting gardens, roads, and properties. Also, the flood event October 8th 2023 caused flooding of gardens at Oakbank Place.

Figure 55 Guildtown Flood risk

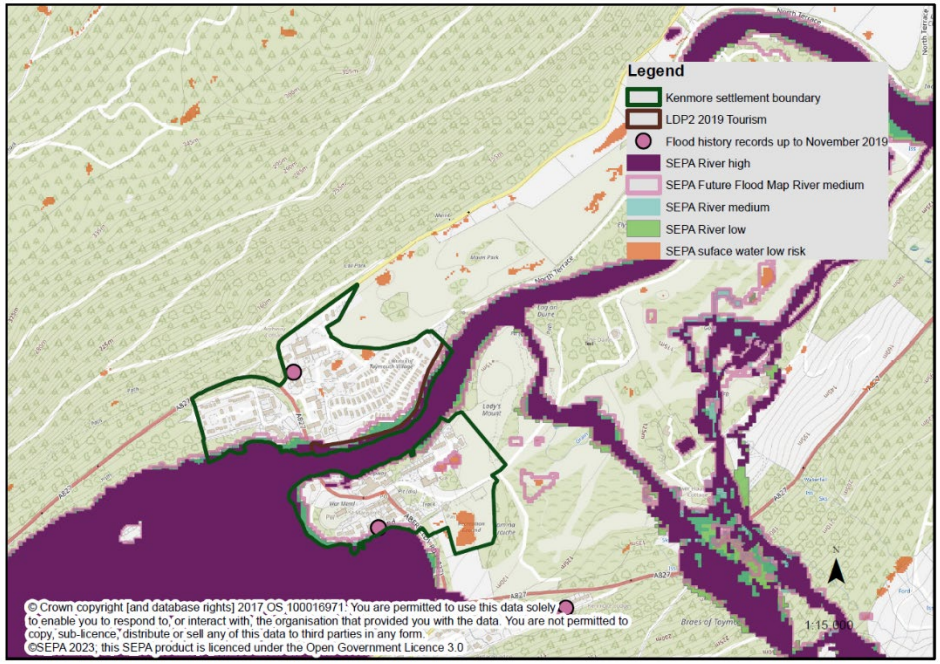


6.118 In terms of Natural Flood Management opportunities, the surface water flood risk, could present a Natural Flood Management opportunity within the village, whilst there are some sediment management opportunities nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kenmore

6.119 Kenmore does not lie within a PVA. Kenmore is located on the east shore of Loch Tay and is separated into two parts by the River Tay with the northern side largely in tourism use. In terms of flood risk, this is largely restricted to the margins, although some areas of surface water flood risk, could also impact on opportunities for development, see figure 56. Flood event records related to a flooded garage and a flooded road.

Figure 56 Kenmore Flood risk

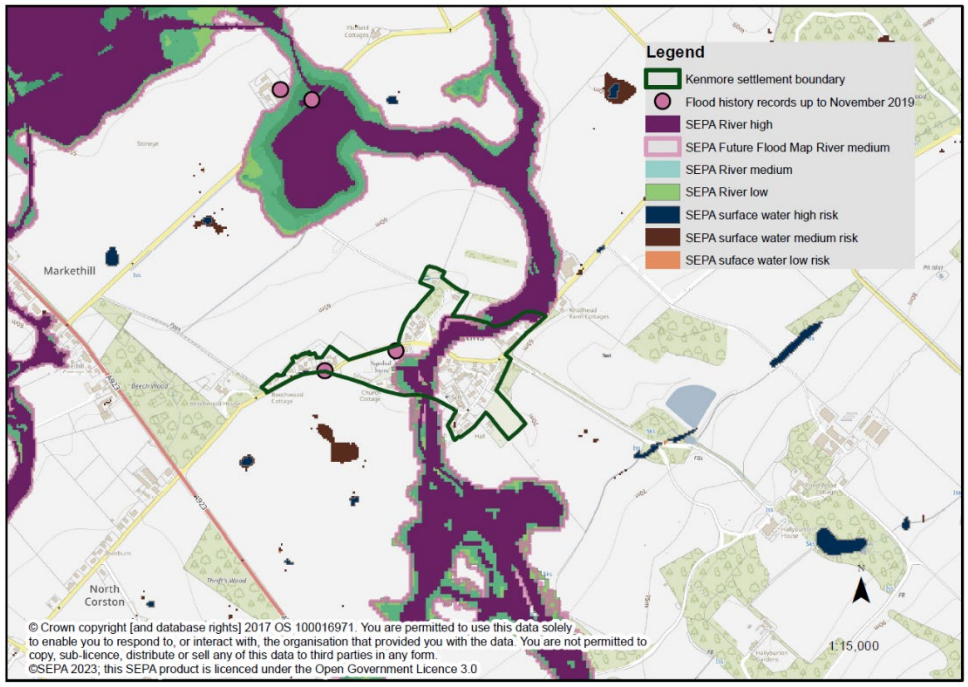


6.120 In terms of Natural Flood Management opportunities, the most significant opportunity locally relates to the River Tay, which is a high erosion opportunity for sediment management as it flows through Kenmore. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kettins

6.121 Kettins does not lie within a PVA. The settlement is impacted by river flood risk, and there are a couple of flood events recorded as well, see figure 57.

Figure 57 Kettins Flood risk map



6.122 In terms of Natural Flood Management opportunities, the main opportunity relates to sediment management of the Kettins burn, and also some floodplain storage opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinfauns

6.123 Kinfauns lies within the Perth and Almondbank PVA, but there are other parts of the PVA which are more significantly affected by flood risk. In figure 58 SEPA river flood risk mapping does not affect the settlement, but areas are affected by surface water flood risk, and in figure 59 you can see the settlement is not affected by SEPA coastal flood risk mapping.

Figure 58 Kinfauns Flood risk map (surface and river)

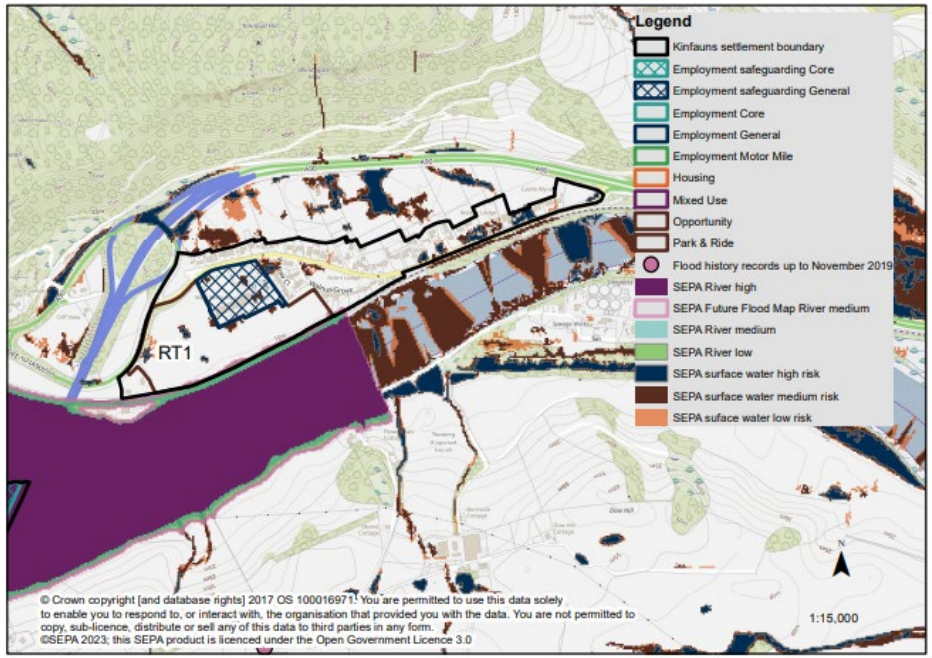
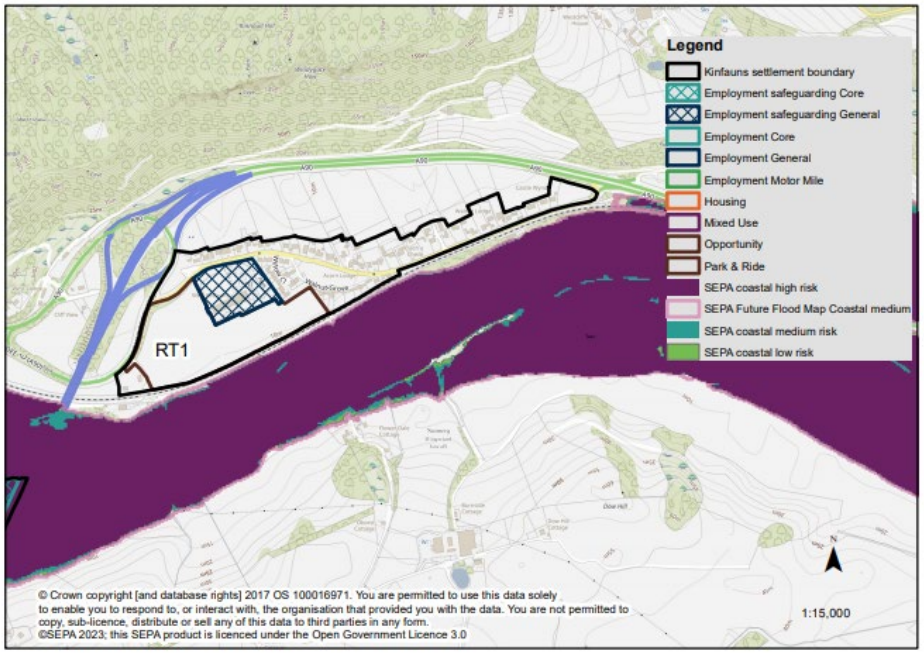


Figure 59 Flood risk map (coastal)

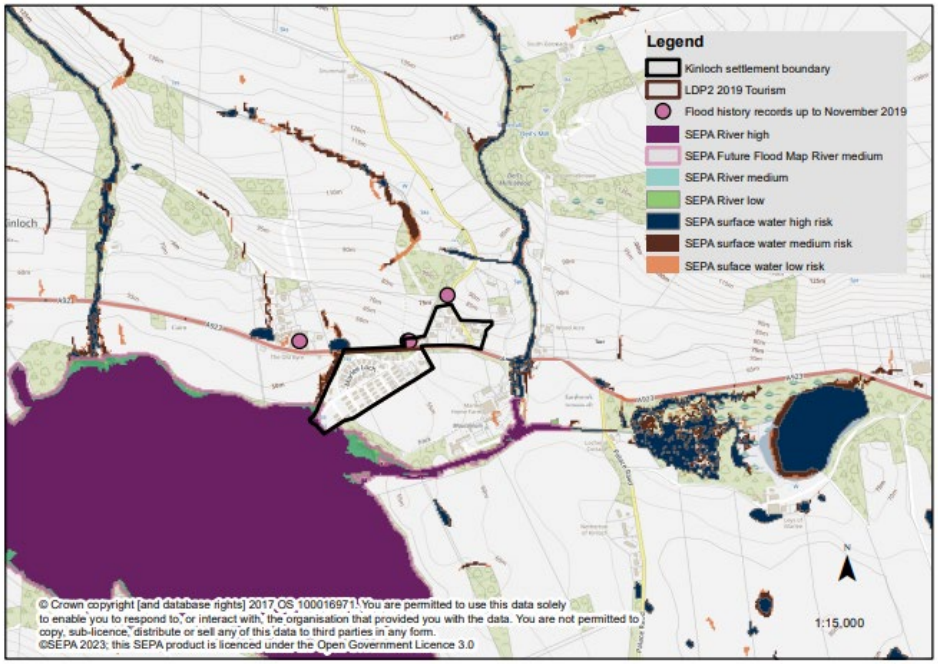


6.124 In terms of Natural Flood Management opportunities, the main opportunities are not within the settlement and relate to runoff reduction and to surface water flood risk areas, and there is an area of floodplain storage opportunity to the east. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinloch

6.125 Kinloch lies within the Blairgowire and Rattray PVA, but it is not as badly affected as other parts of the PVA. On figure 60 the SEPA flood risk layers have an impact on marginal areas within the settlement.

Figure 60 Kinloch Flood risk



6.126 In terms of Natural Flood Management opportunities there is little, although there is some floodplain storage, and surface water flood risk areas might have some potential too. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinloch Rannoch

6.127 Kinloch Rannoch does not lie within a PVA. The settlement is significantly affected by flood risk, with large areas to north of the River Tummel within the SEPA flood risk extents (see figures 61 and 62). There are approximately 30 residential properties and 20 non-residential properties at risk of flooding in the Kinloch Rannoch PVA. There was a record of sewer flooding on Buchanan Place in Kinloch Rannoch with flooded road and garden on October 12th, 2012, and another street level flood event recorded at Loch Rannoch Highland Club on December 4th 2015.

Figure 61 Kinloch Rannoch Flood risk

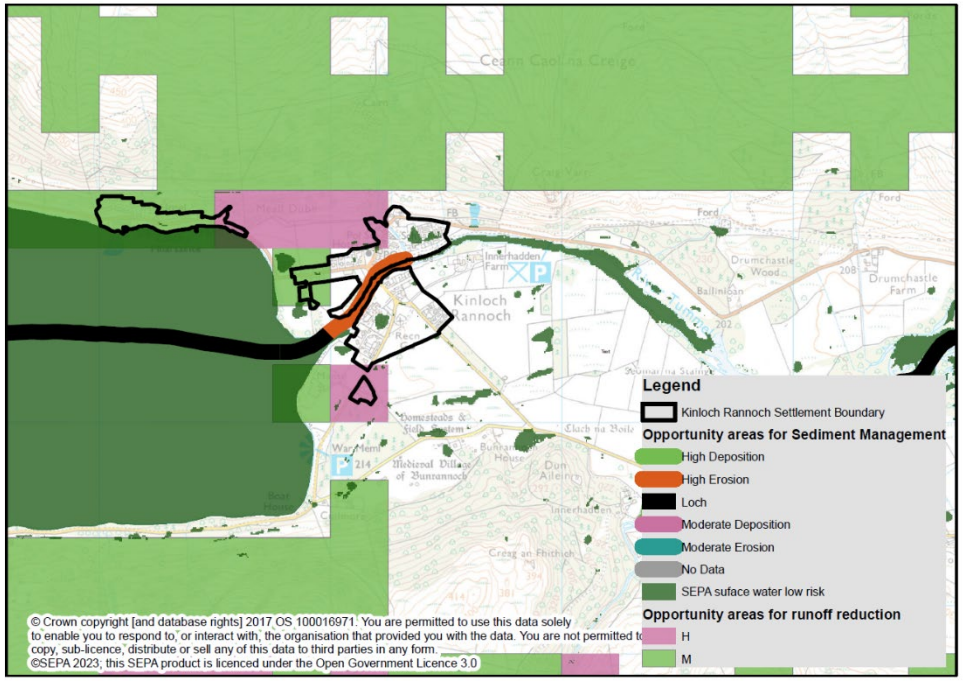
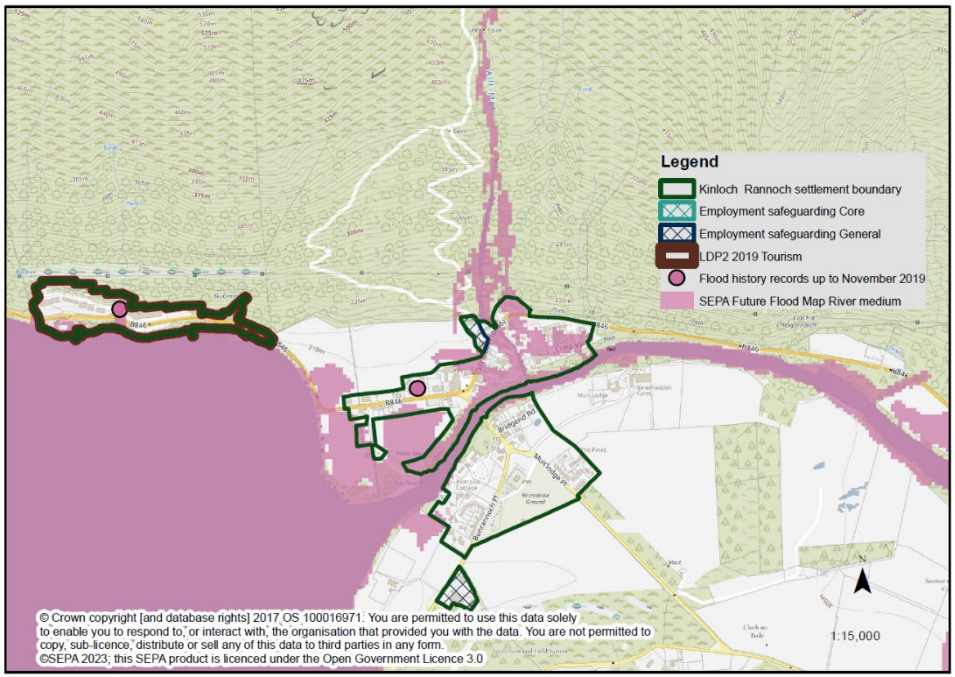


Figure 62 Kinloch Rannoch Flood risk (at risk areas)

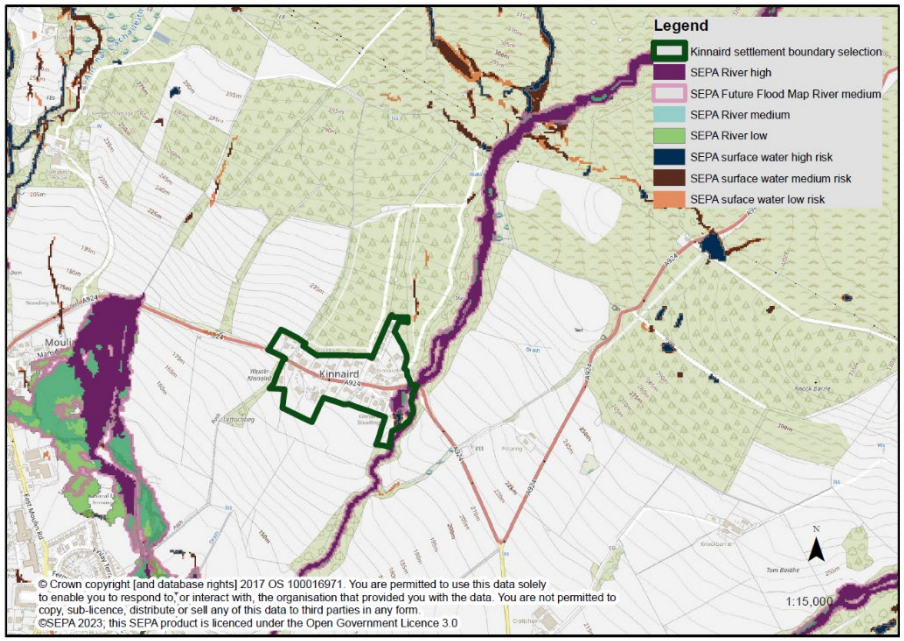


6.128 In terms of Natural Flood Management opportunities there is an opportunity to reduce erosion on the River Tummel which runs through the settlement, and there are nearby opportunities to reduce surface runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinnaird (Highland)

6.129 Kinnaird lies within the Pitlochry PVA, but there are areas which are more significantly affected within this PVA. The settlement has no flood event records, but there SEPA flood risk mapping does affect the eastern edge (see figure 63).

Figure 63 Kinnaird Flood risk

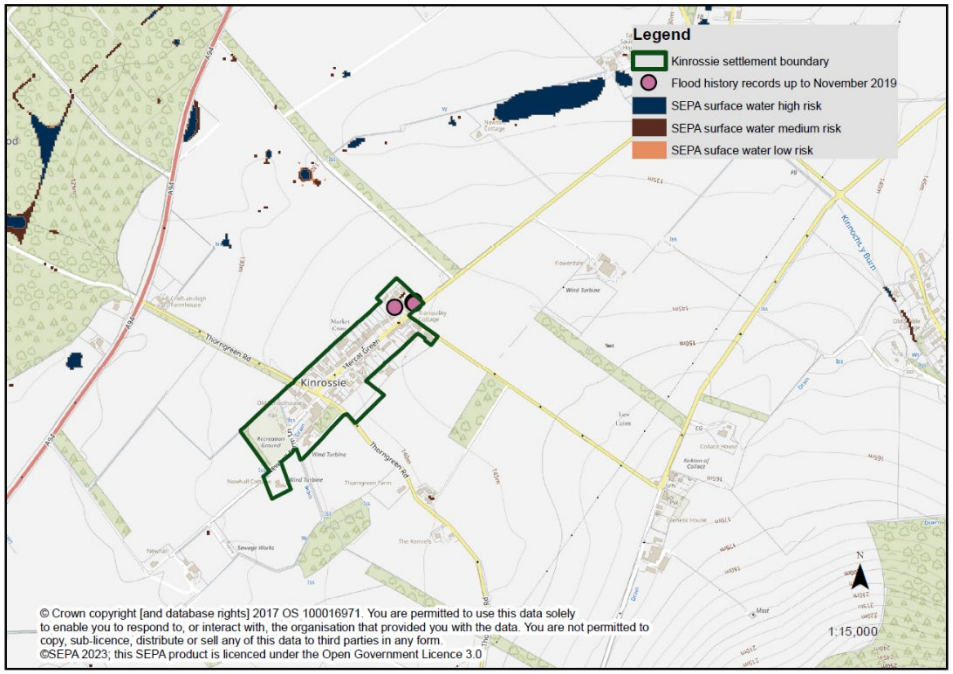


6.130 In terms of Natural Flood Management opportunities there is an opportunity for better sediment management related to the Kinnaird Burn. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinrossie

6.131 Kinrossie does not lie within a PVA. The settlement is not impacted by SEPA flood risk mapping, but there are a few of flood event records for the north end of the village, surface water events in 2004, 2008 and 2009 which you can see on figure 64.

Figure 64 Kinrossie Flood risk

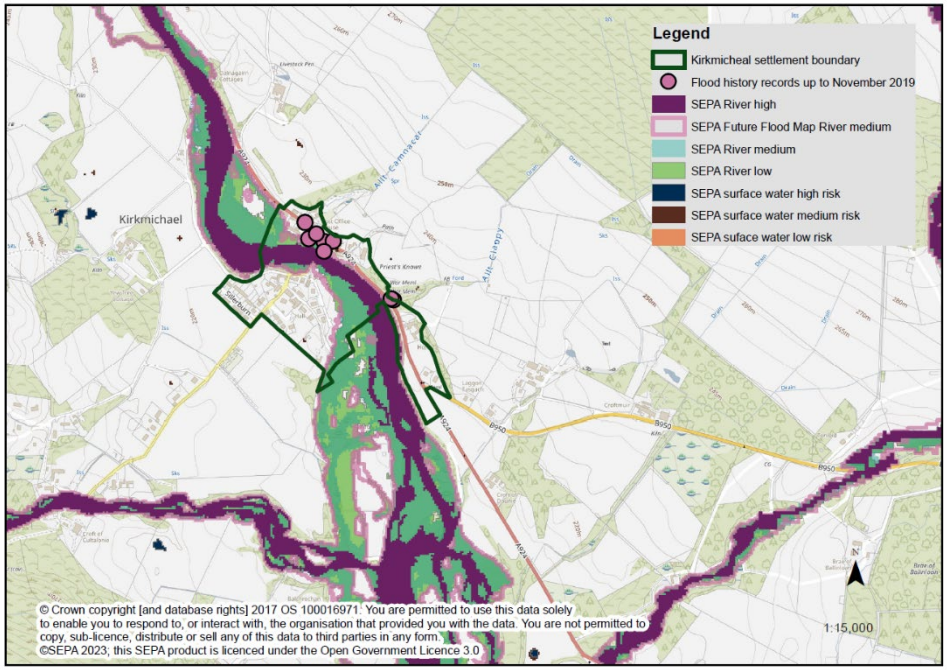


6.132 In terms of Natural Flood Management opportunities there are no substantial opportunities nearby, although surface water flood risk areas may have some potential. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kirkmicheal

6.133 Kirkmicheal does not lie within a PVA. However there has been quite a lot of flood event records for the northeastern part of the village usually surface water but also sewer flooding events, with a couple of fluvial events affected the southern part of the village, as can be seen on figure 65. The village is also impacted by SEPA river flood risk areas.

Figure 65 Kirkmicheal Flood risk map

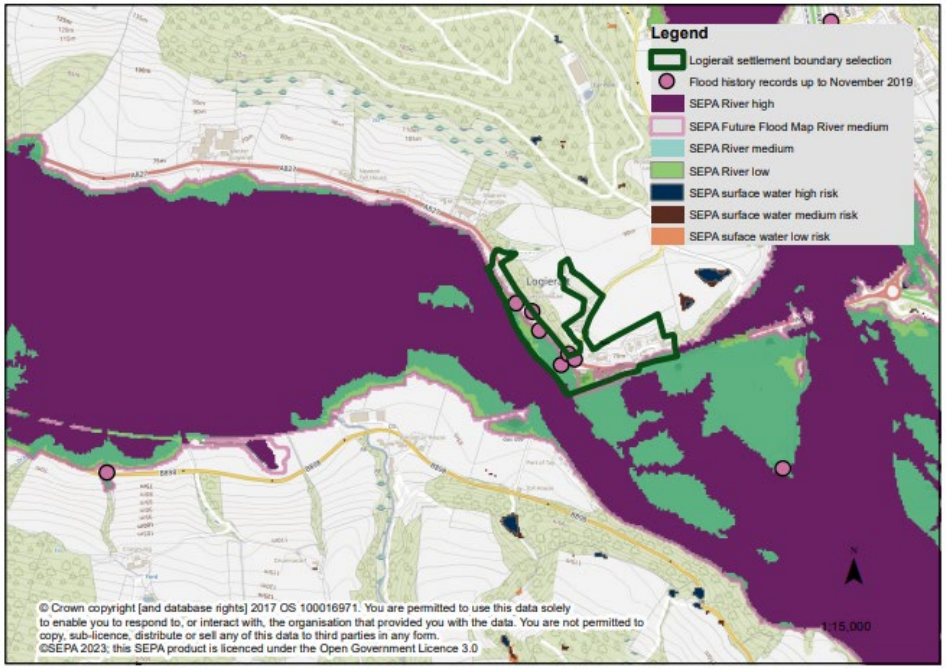


6.134 In terms of Natural Flood Management opportunities, the main opportunity relates to the River Ardle. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Logierait

6.135 Logierait does not lie within a PVA. The settlement along its southern edge is significantly affected by SEPA flood risk, and by fluvial and pluvial flood event records, spread over various events (occurring in 2005, 2006, 2008, 2010 and 2015) (see figure 66). Also, there was a couple of properties flooded on the 27th December 2023.

Figure 66 Logierait Flood risk

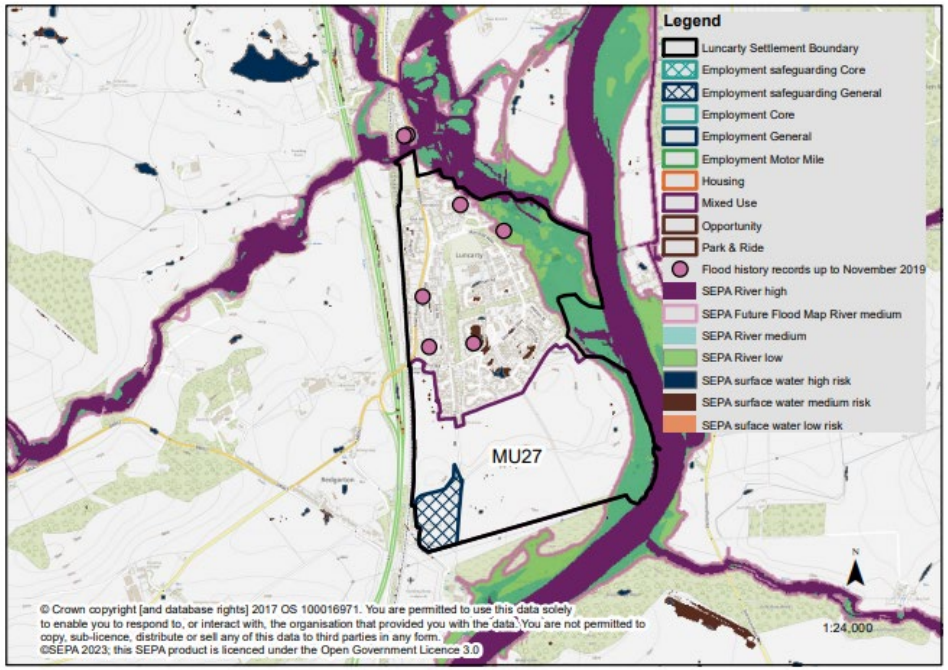


6.136 In terms of Natural Flood Management opportunities there are substantial floodplain and sediment management. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Luncarty

6.137 Luncarty lies within the Luncarty PVA. There are approximately 90 homes and businesses at risk of flooding in this PVA. The majority of the LDP2 Mu27 site (under A & J Stephens ownership) has a planning in principle consent on it for 650 units (17/00847/IPM) it has a condition which requires, 'As part of any application for the Approval of Matters Specified in Condition, full drainage calculations and the final layout and depth of the proposed SUDS ponds and associated infrastructure to be agreed in writing with the Council as Planning Authority.' There are some street level surface water recorded flood events, and river flood risk affects the eastern edge of Luncarty (see figure 67).

Figure 67 Luncarty Flood risk

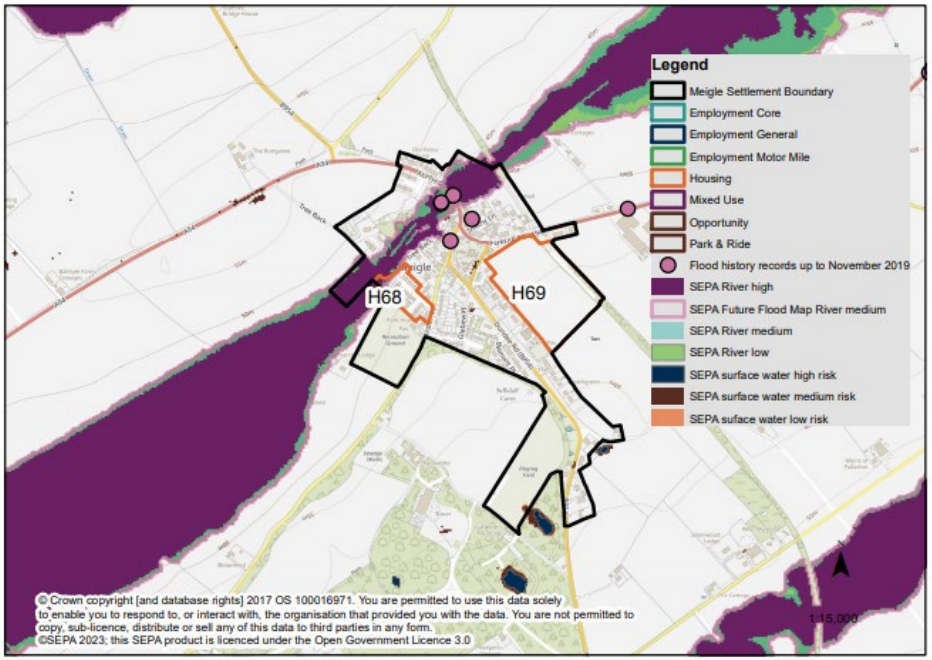


6.138 In terms of Natural Flood Management opportunities there are significant sediment management opportunities, and floodplain storage opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Meigle

6.139 Meigle does not lie within a PVA, but there are pluvial and river flood events recorded within the northern part of Meigle and SEPA river flood risk affects the settlement too, see figure 68. The developable area of LDP2 H68 (which has since been developed) took account of this with landscaping along its northern extent, whilst H69 is not impacted by flood risk. There was also a couple of properties flooded on the 27th of December 2023. Also, on October 19th 2023 the cottage on Alyth Road flooded.

Figure 68 Meigle Flood risk

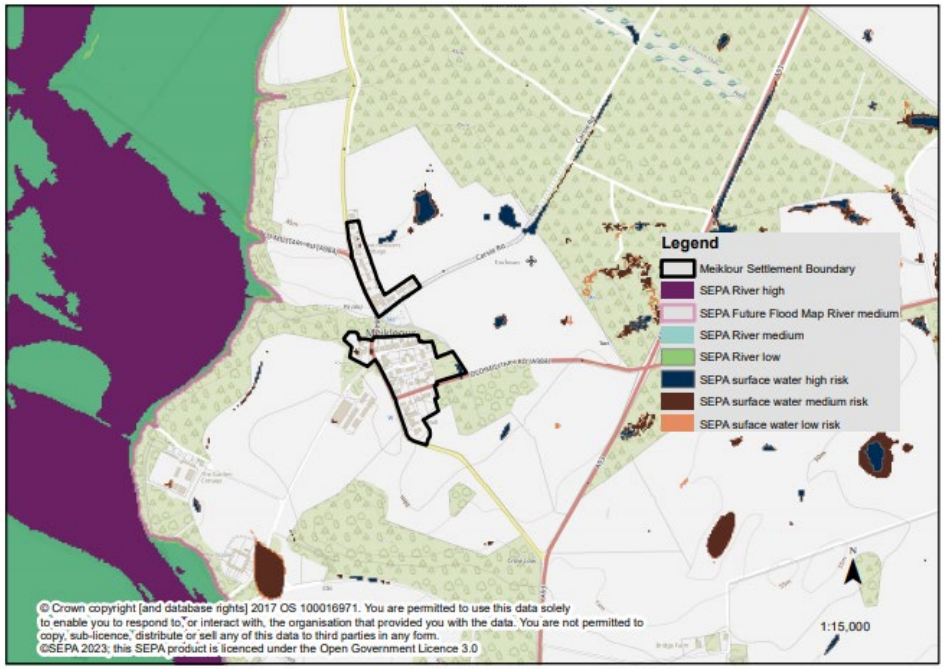


6.140 In terms of Natural Flood Management opportunities there are floodplain storage and sediment management opportunities associated to the Meigle burn. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Meikleour

6.141 Meilkleour does not lie within a PVA, and the settlement is not greatly affected by SEPA flood risk mapping with small areas of surface water flood risk, and no flood events recorded, (see figure 69).

Figure 69 Meilkleour Flood risk



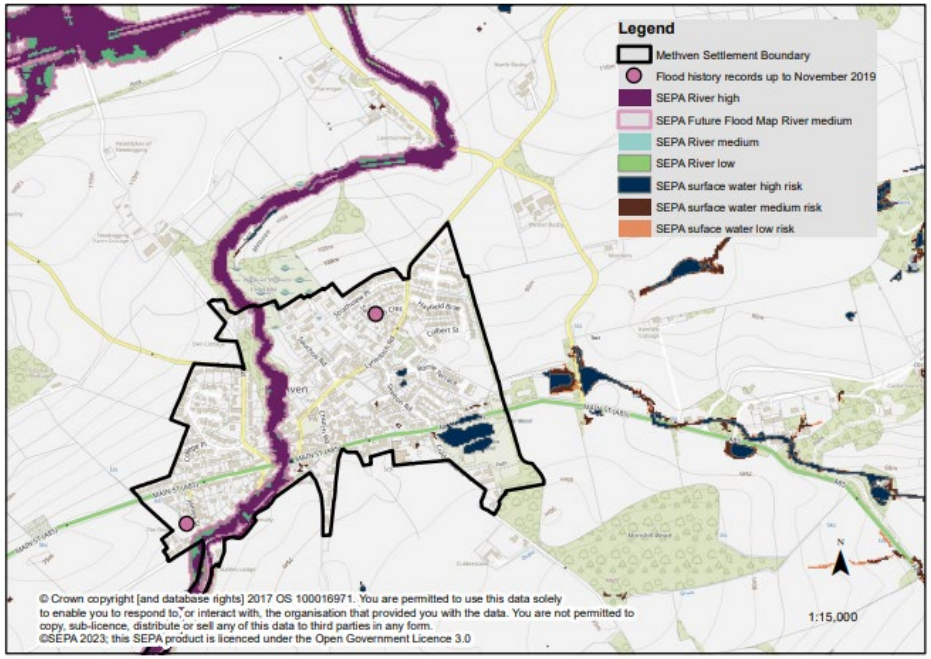
6.142 In terms of Natural Flood Management opportunities there are some good floodplain storage opportunities associated to the River Tay to the west, and some surface water flood risk areas which may have potential for Natural Flood Management. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Methven

6.143 Methven lies within the Perth and Almondbank PVA, and there are approximately 50 homes and businesses currently at risk of flooding. There was a flood event recorded associated to fluvial flooding of an unnamed burn to the west of the village which flooded a garden on July 21st, 2010, and there was also a flood event recorded for surface water flooding of a road, July 30th 2002 (see figure 70). SEPA flood risk river mapping for the Methven burn affects parts of the village, whilst there are areas of surface water flood risk associated to the recreation ground to the east of the village.

6.144 In terms of Natural Flood Management opportunities there is an area of surface water flood risk which may have opportunity for some Natural Flood Management and there are some sediment management opportunities related to the Methven burn to the north of the village. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 70 Methven Flood risk map

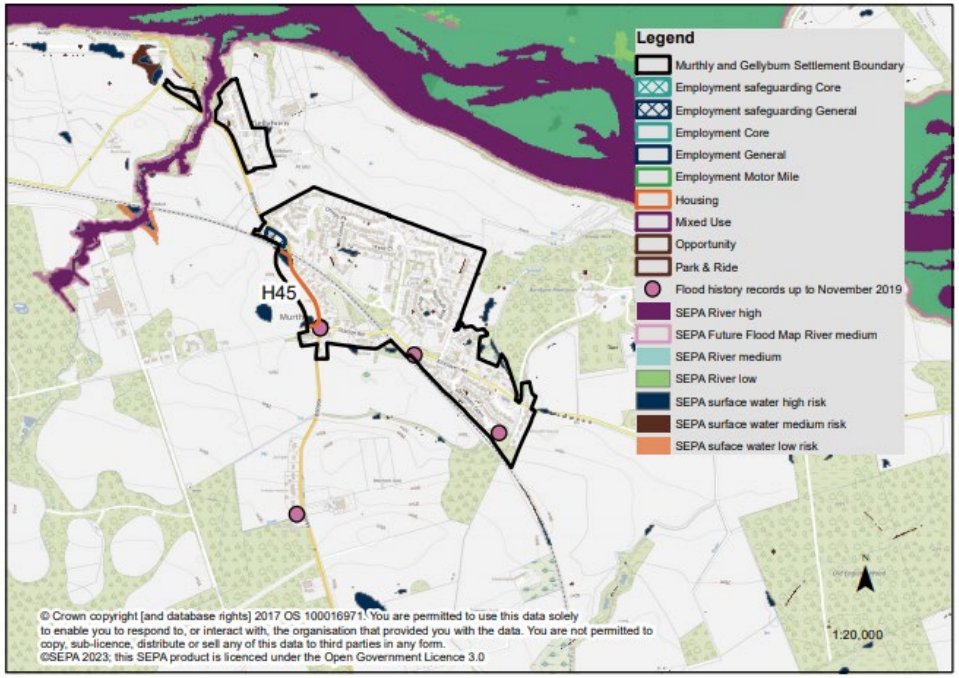


Murthly and Gellyburn

6.145 Murthly and Gellyburn lies within the Dunkeld and Birnam PVA, but it is not a particularly affected part of the PVA. There are some fluvial and pluvial (eastern record, street level, flooded road) flood risk and also street level events which have been recorded (see on figure 71). LDP2 H45 requires an FRA. Also, SEPA surface water flood risk impacts on some small areas of the settlement.

6.146 In terms of Natural Flood Management opportunities there are some sediment managements and flooplain storage potential opportunities related to the River Tay to the north. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

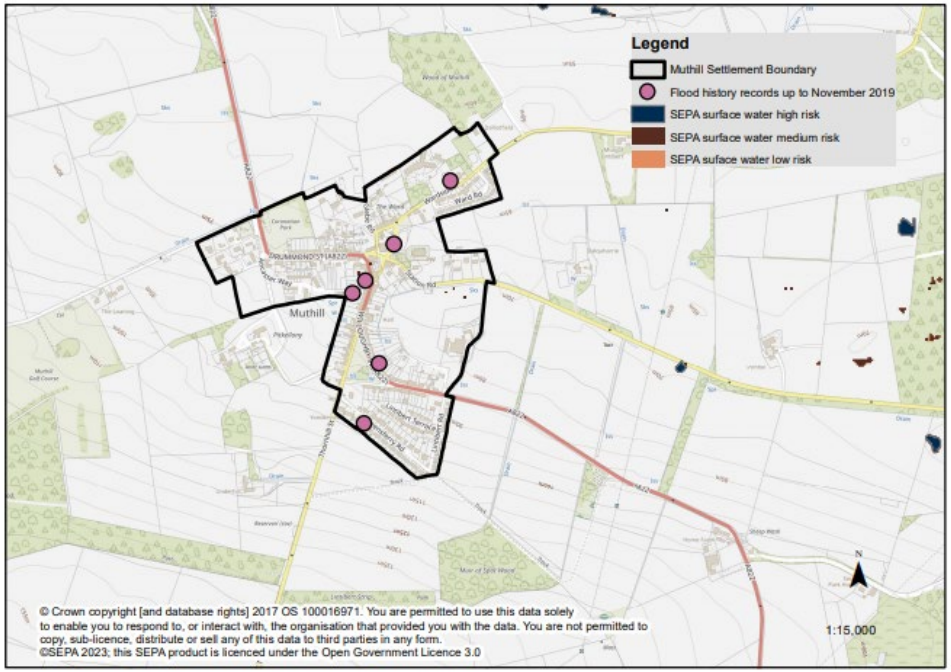
Figure 71 Murthly and Gellyburn Flood risk map



Muthill

6.147 Muthill does not lie within a PVA, and the SEPA flood risk mapping does not impact on the settlement. However, on November 29th 2011, and on 13th of December 2006 fluvial flood events affected various parts of the village (see figure 72).

Figure 72 Muthill Flood risk



6.148 In terms of Natural Flood Management opportunities there are no real opportunities, there is hardly even any SEOA surface water flood risk areas nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Perth

6.149 Perth lies within the Perth and Almondbank PVA. Within Perth and Almondbank PVA there are approximately 2,600 homes and businesses at risk of flooding. Within Almondbank there are approximately 50 homes and businesses at risk of flooding. Please refer to the table in table 1 for more information about how various flood events have impacted on the settlements, and please refer to the figures 73, 76, 79, and 82 for mapped information on where flood events have occurred.

6.150 There are various significant flood protection schemes which Perth benefits from including Perth Flood Protection Scheme that was completed 2002, which in addition to River Tay defences also includes flood defences on the Perth Town Lade and Craigie Burn, and there is also the Almondbank Flood Protection Scheme.

6.151 The Craigie flood study recommends the following two actions: a) upgrade and increase the capacity of the existing culvert on the Craigie Burn at Queen's Avenue (at the access to Queen's Court). B) localised channel modifications on the Craigie Burn (adjacent to Balmoral Place and Queen's Avenue) upstream and downstream of the upgraded culvert. The funding has been provided in budget approved by Full Committee. This will now be progressed outwith the typical FRM delivery cycle approach. Further details on this proposed scheme are provided in paragraph 5.37.

6.152 Mapping has been prepared to show the different parts of Perth, and how they are affected by flood risk. Four separate maps North, South, East and West maps have been prepared to show the river and surface flood risk, the coastal flood risk, and the future flood risk areas (combining both the coastal and river flood risk mapping which comprise the at risk areas in NPF4) affects Perth.

Perth North

6.153 It is noted that LDP2 E3, and E1 allocations are significantly impacted by flood risk as can be seen on figure 75. Whilst these sites will be considered through the Proposed plan, this area is largely a mix of: developed areas, areas with planning permissions where the intention to develop has been implemented, or in the case of the northern part of the E3, this has secured Planning Permission in Principle 21/00752/IPM for a proposed employment/business park with 6 years for the matters specified applications to come forward. Therefore, there is little the Proposed Plan has control to change here, however a permission on part of the E1 allocation 18/00088/FLL appears to have lapsed.

6.154 Regarding the LDP2 E38 allocation marginal areas are affected by SEPA flood mapping, however a 19/ 02033/IPM in principle application was approved 14th January 2021 for LDP2 policy compliant class 4,5 and 6 uses with 15 years for the matters specified applications to come forward. As part of any application for the Approval of Matters Specified by Condition (AMSC), detailed sustainable urban drainage system (SUDS) shall be submitted for approval of the Council as Planning Authority, in consultation with SEPA where necessary. The scheme shall be developed in accordance with the technical guidance contained in The SUDS Manual (C753) and the Council's Flood Risk and Flood Risk Assessments Developer Guidance and shall incorporate source control.

6.155 On figure 73 the developable area within the LDP2 H319 Ruthvenfield allocation could be affected by flood risk as areas are within the at risk areas in the indicative SEPA mapping. There is currently a site specific developer requirement for, 'A Flood Risk Assessment and Drainage Impact Assessment will be required. Areas protected by the Flood Protection Schemes should be subject to appropriate mitigation measures including water resistance, and water resilience measures and evacuation procedures.'

Figure 73 Perth North, River and surface water Flood risk

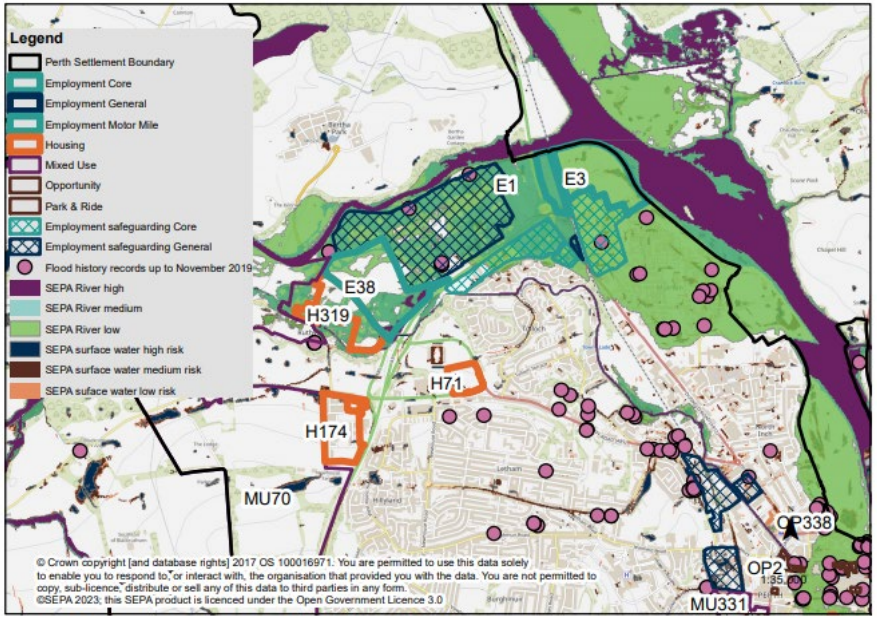


Figure 74 Perth North, Flood risk map coastal

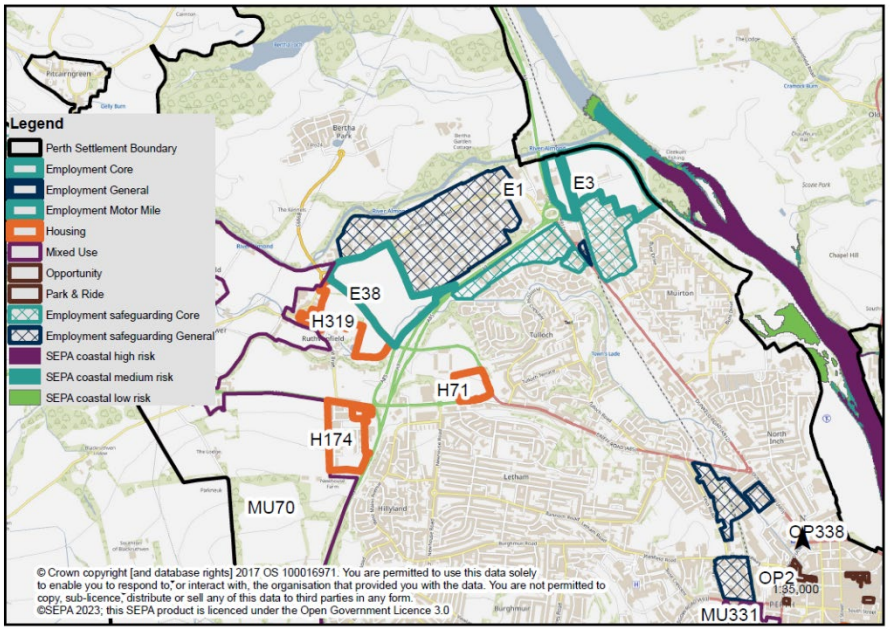
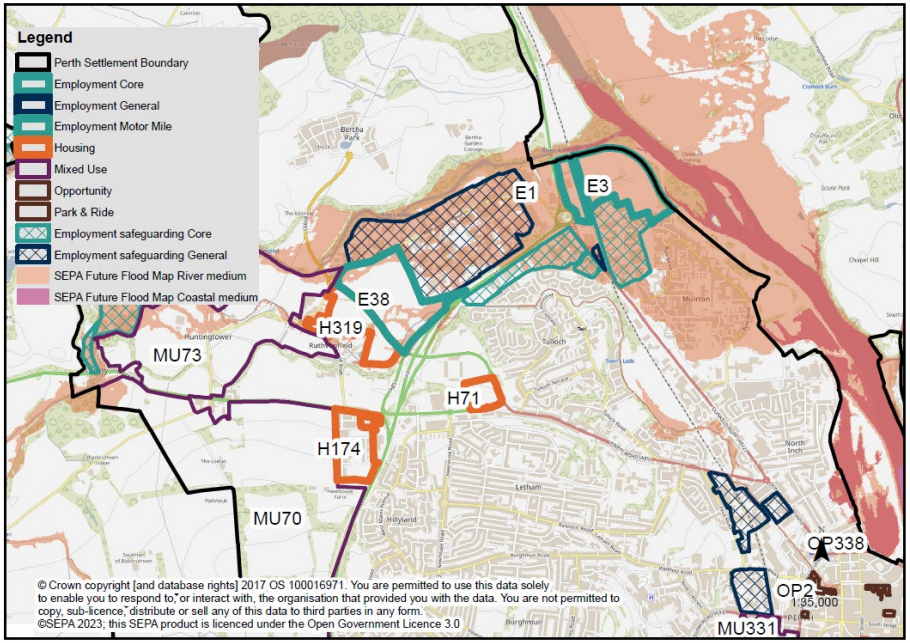


Figure 75 Perth North, Future Flood risk map (at risk areas)



6.156 In terms of Natural Flood Management opportunities there are significant sediment management opportunities related to the River Almond and Tay. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Perth south

6.157 Perth south is not affected by the SEPA flood risk areas in terms of the LDP allocations for development. However, in figure 76 flood record events do significantly affect this part of Perth, as does the SEPA flood mapping on Figure 78. LDP2 E340 has been developed, whilst E2, and E165 both have requirement for an FRA.

Figure 76 Perth South, river and surface water flood risk

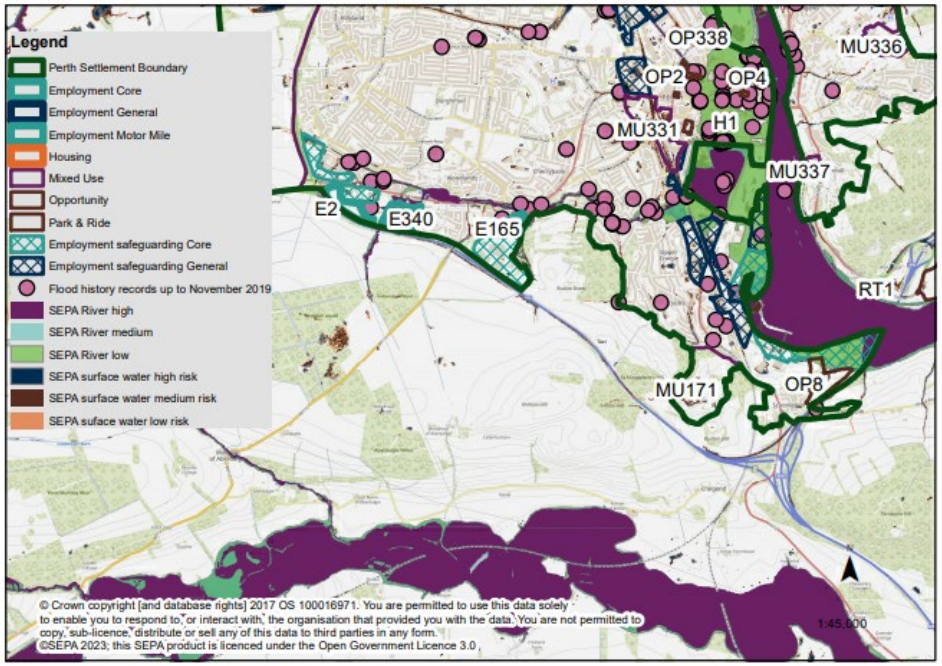


Figure 77 Perth South, Flood risk coastal

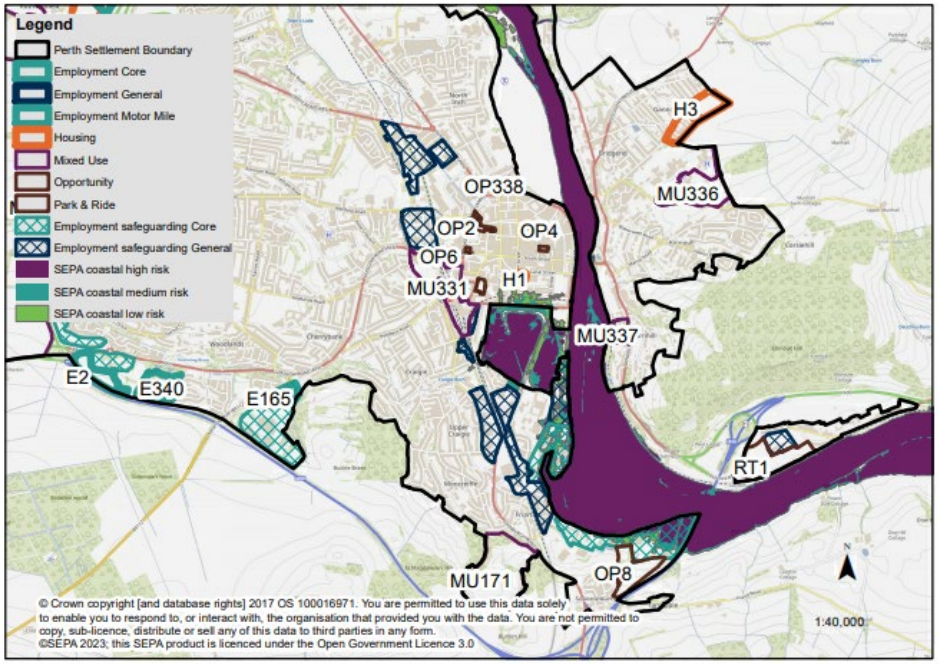
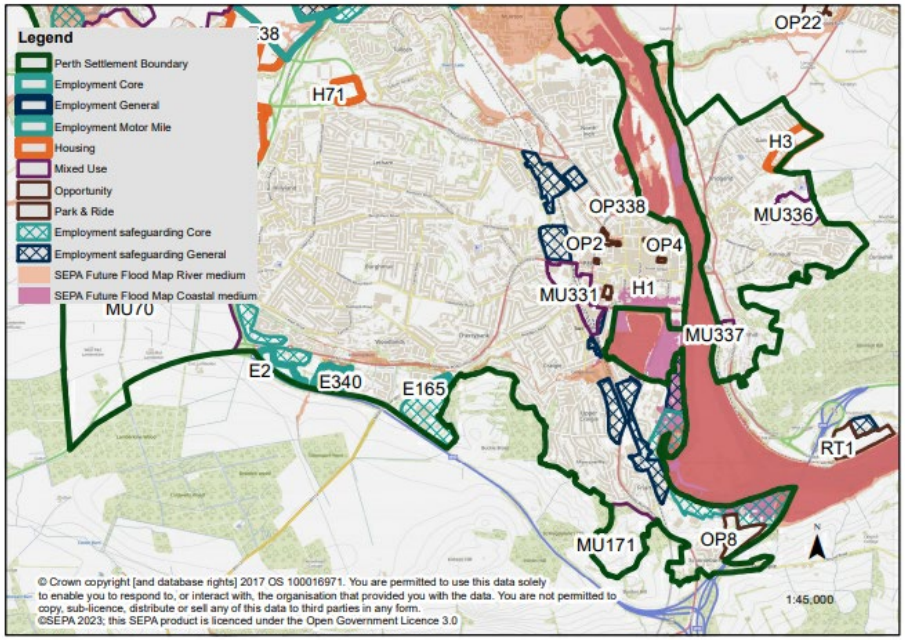


Figure 78 Perth South, river and coastal future flood risk (at risk areas)



6.158 In terms of Natural Flood Management opportunities, the limited opportunities relate to reducing surface water runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Perth east

6.159 Perth east (including city centre) is not affected by the SEPA flood risk areas in terms of the allocations for development. However, in figure 79 flood record events do significantly affect this part of Perth, as does to a lesser extent the SEPA flood mapping on Figure 80 with southern parts of the city centre within at risk areas. These at risk areas do not impact on the LDP2 allocations.

Figure 79 Perth East, river and surface water flood risk

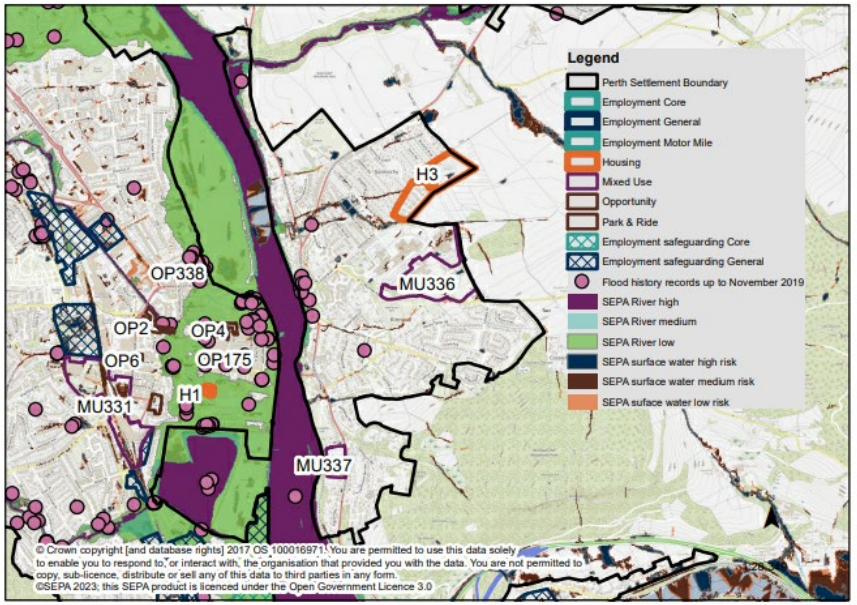


Figure 80 Perth East, Flood risk map coastal

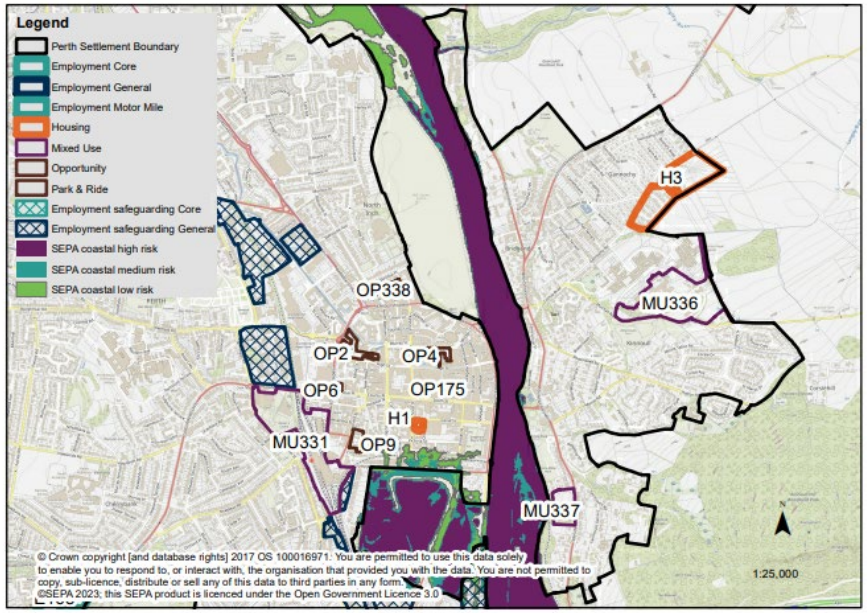
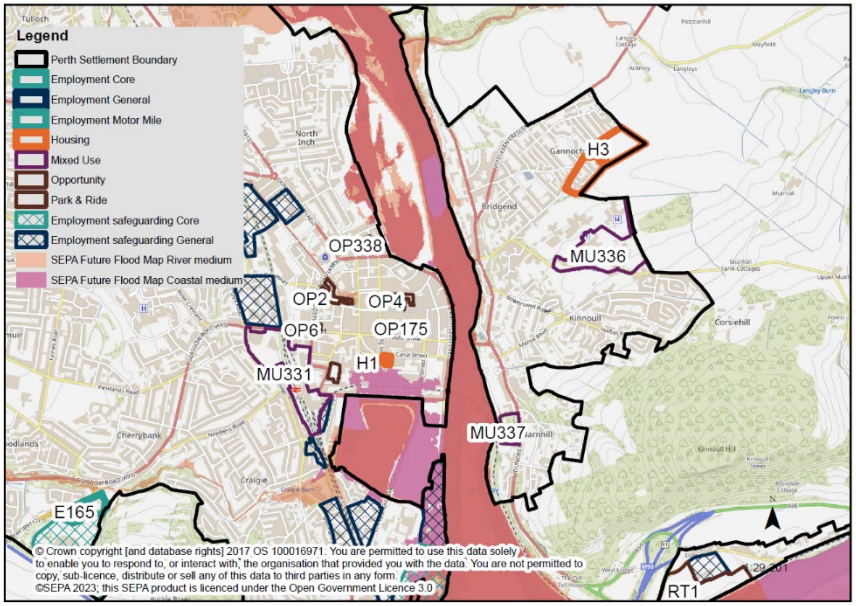


Figure 81 Perth East, river and coastal future flood risk (at risk areas)



6.160 In terms of Natural Flood Management opportunities there are few opportunities, and the main ones are likely to be related to surface water risk areas. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Perth west

6.161 Perth west is less affected by flood risk than the other areas of Perth (see figures 82,83, and 84). The allocated sites, of LDP2 Mu73 Almond Valley, and Mu168 Bertha Park, and part of Mu70 Perth West all have approved in principle permissions with masterplans which take account of flood risk, which does impact on the developable areas within Mu73 and Mu168 at the margins. For Mu73 the in principle approval for the overall masterplan includes a condition that requires a detailed flood risk assessment should be submitted with the details of the first phase (19/01433/AMM which has since secured planning permission) and subsequent phases of development for the approval of the planning authority. LDP2 allocations E38 and H319 are considered under Perth North.

Figure 82 Perth West, river and surface water flood risk

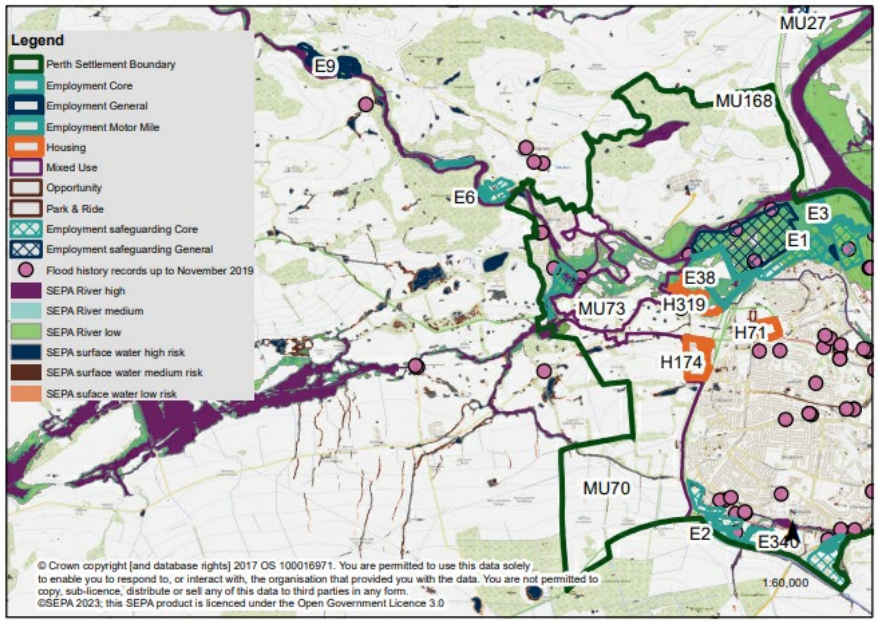


Figure 83 Perth West, Flood risk map coastal

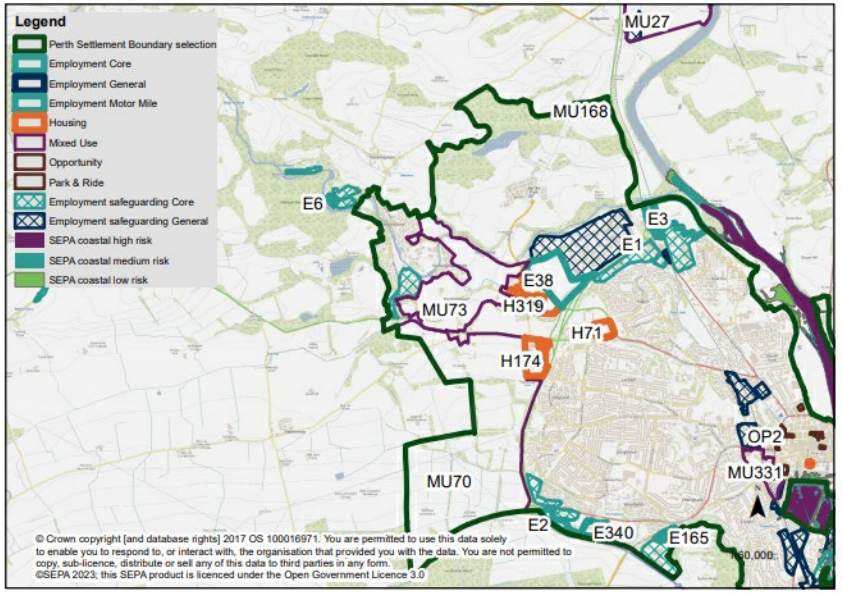
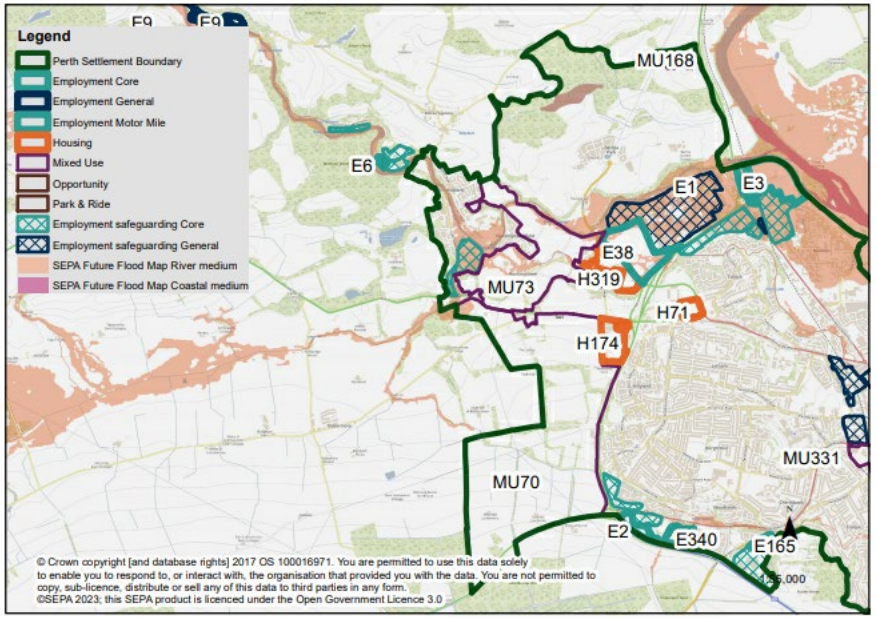


Figure 84 Perth West flood risk (at risk areas)

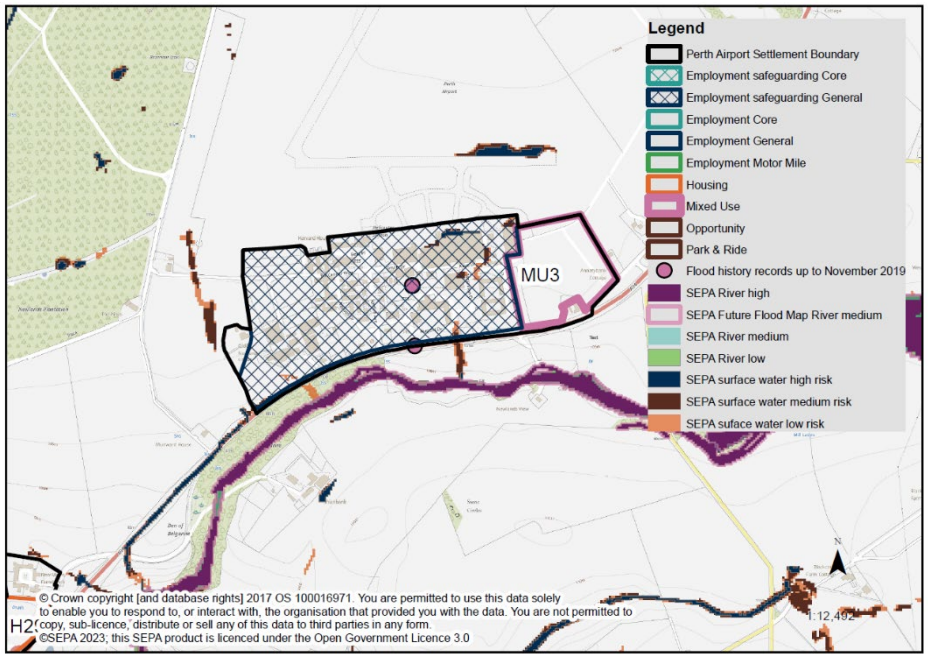


6.162 In terms of Natural Flood Management opportunities, there are significant sediment management and floodplain storage area potential within this area. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Perth Airport

6.163 In figure 85 although Perth airport does lie within the Perth and Almondbank PVA, it is only affected to small extent by SEPA surface water flood risk areas, whilst there are a couple of flood events recorded for street level flooding of roads from the 6th of July 2009. There is an FRA requirement associated to LDP2 Mu3.

Figure 85 Perth Airport Flood risk



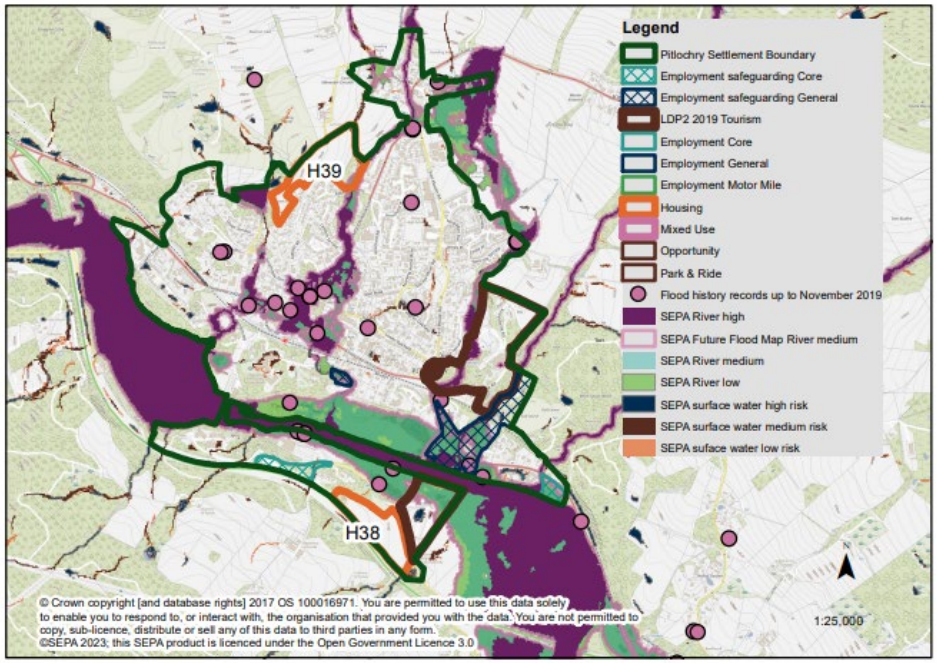
6.164 In terms of Natural Flood Management opportunities there some significant sediment and floodplain storage opportunities nearby, but limited opportunities within, perhaps surface water risk areas may be opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Pitlochry

6.165 Pitlochry lies within a Pitlochry PVA. The main source of flooding is the River Tummel and small watercourses. Perth and Kinross Council has carried out a flood study in this area which estimated that there are approximately 155 homes and 75 businesses currently at risk of flooding. On figure 86 there are a lot of flood event records within Pitlochry, particularly in and around the town centre.

6.166 Please see Figure 86 which shows how SEPA flood risk mapping impacts on the settlement of Pitlochry, and its existing LDP2 allocations. The main areas of flood risk are in the town centre associated to the Moulin Burn, and at the south side of the town associated with the River Tummel. There is a limited potential impact on the northeastern edge of the H39 housing allocation, and there is a LDP2 developer requirement for an FRA to ensure development is outwith the flood risk area. The Plan seeks to protect and retain existing employment and tourism uses, and see figure 86, some of this area will be constrained by flood risk. The site reserved for retail development west of Bridge Road is within an at risk area. However, the applicant demonstrated a commencement of the supermarket development 10/00666/FLM on the site, in March 2014, and the site has planning permission in perpetuity. The settlement and opportunities for future growth will be significantly constrained by flood risk.

Figure 86 Pitlochry Flood risk map



6.167 In terms of Natural Flood Management opportunities there are significant sediment and floodplain storage opportunities within the close to the settlement. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

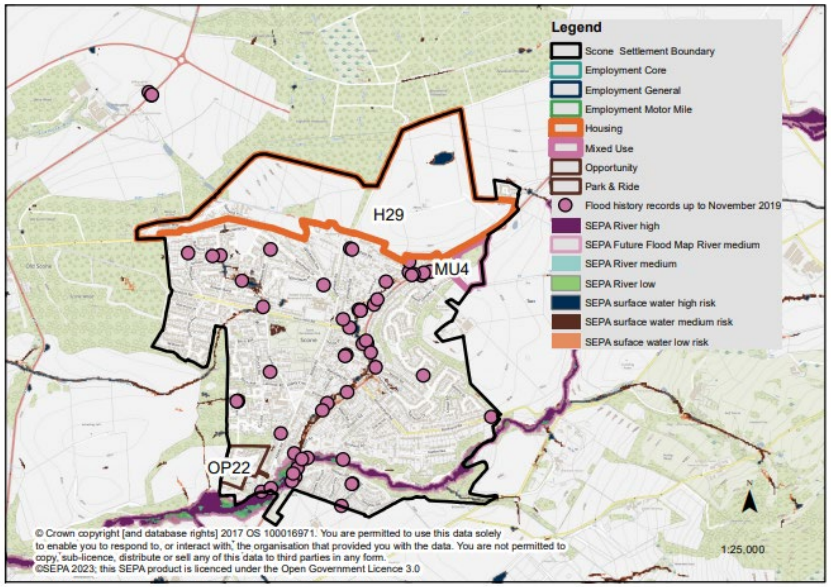
Scone

6.168 Scone lies within a PVA. There are approximately 180 homes and businesses at risk of flooding in the Scone PVA. This PVA has been exposed to recent significant weather events. In May 2017, heavy rainfall led to roads in the area being flooded. Heavy rain on 11 and 12 August 2020 led to surface water flood water outside some properties to rise to the level of airbricks. A flood event was recorded February 2021 when multiple areas across Perth and Kinross were affected, including Scone. You can see the many flood event recorded up to November 2019 on figure 87. Also, a property flooded on Mansfield Road on the 27th December 2023, whilst 54 properties were flooded on 29 May 2024 due to intense rainfall event. The commencement of the Scone Flood Protection Scheme has been deferred due to a pause in the capital grant funding.

6.169 The settlement itself is significantly affected by flood risk, but it has not greatly impacted on the future growth of Scone, with LDP2 allocations not significantly affected (see figure 87). H29 requires Flood Risk Assessment required, and the results may reduce the amount of land available for development. Groundwater flooding will need to be considered as spring and dry valley are within the site boundary. The development of the site must not increase the risk of flooding down gradient and may require improvements to current drainage arrangements off-site. Planning Permission in Principle has been secured across the entire North Scone site (16/02127/IPM). The approved Masterplan splits the proposal into four large phases. An application approval of matters specified in conditions for erection of 42 dwellinghouses was approved August 2019.

6.170 In terms of Natural Flood Management opportunities there are significant sediment management opportunities on the Annaty Burn, and perhaps some opportunities to reduce runoff and for Natural Flood Management on surface water risk sites. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 87 Scone Flood risk map

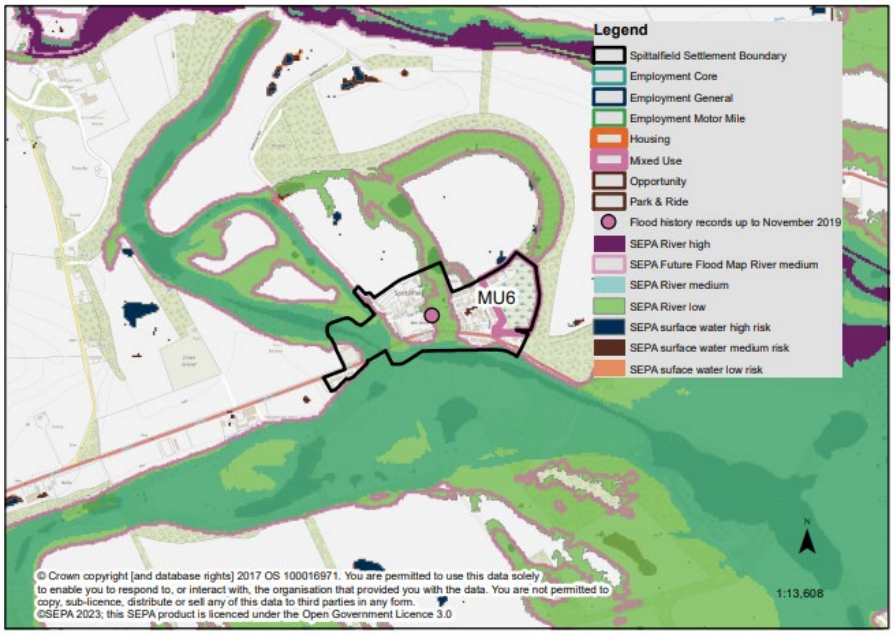


Spittalfield

6.171 Spittalfield lies within a PVA for Dunkeld and Birnam. The main concern is flooding from the River Tay to homes and the A984, and how this risk may change in future because of climate change. SEPA's flood maps indicate that currently there are approximately 6 homes and businesses at risk from flooding. On figure 88 there are significant areas affected by SEPA flood risk mapping, and there is a flood risk event record from 7th July 2015 for surface water event at street level.

6.172 The settlement development opportunity at LDP2 MU6 is not significantly affected by SEPA flood mapping (see figure 88), but there is some surface water flood risk.

Figure 88 Spittalfield Flood risk

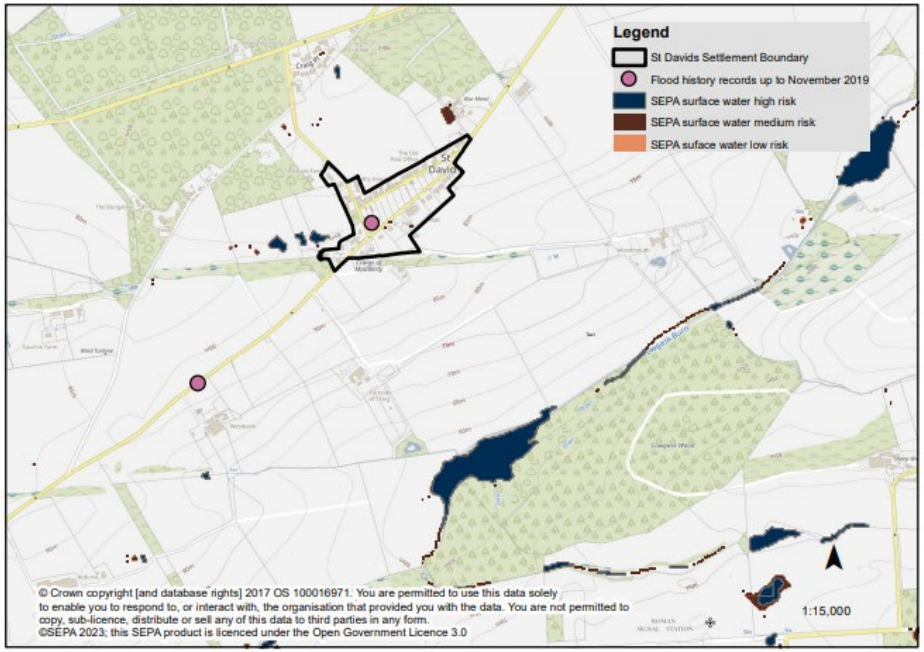


6.173 In terms of Natural Flood Management opportunities there are some floodplain storages, and sediment management opportunities within the settlement and nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

St David's

6.174 St Davids does not lie within a PVA. The settlement is not significantly affected by SEPA flood risk (see figure 89), but there was a property level flood event recorded December 4th, 2015.

Figure 89 St David's Flood risk map

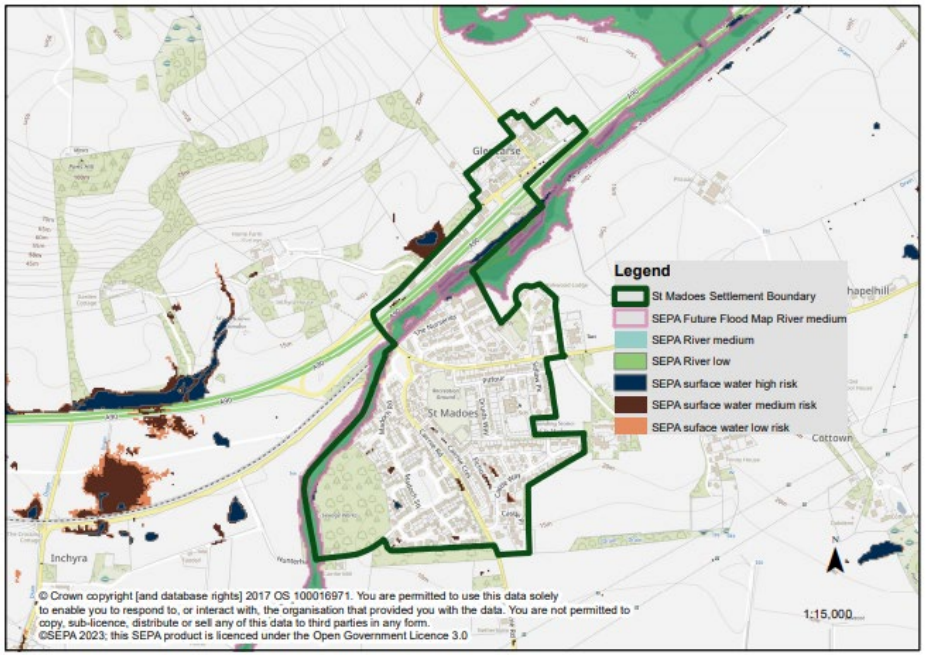


6.175 In terms of Natural Flood Management opportunities there is no opportunity within the settlement but there are a few local opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

St Madoes and Glencarse

6.176 St Madeos and Glencarse does not lie within a PVA, and there are no flood event records associated. It is affected by SEPA flood mapping though (see figure 90).

Figure 90 St Madoes and Glencarse Flood risk

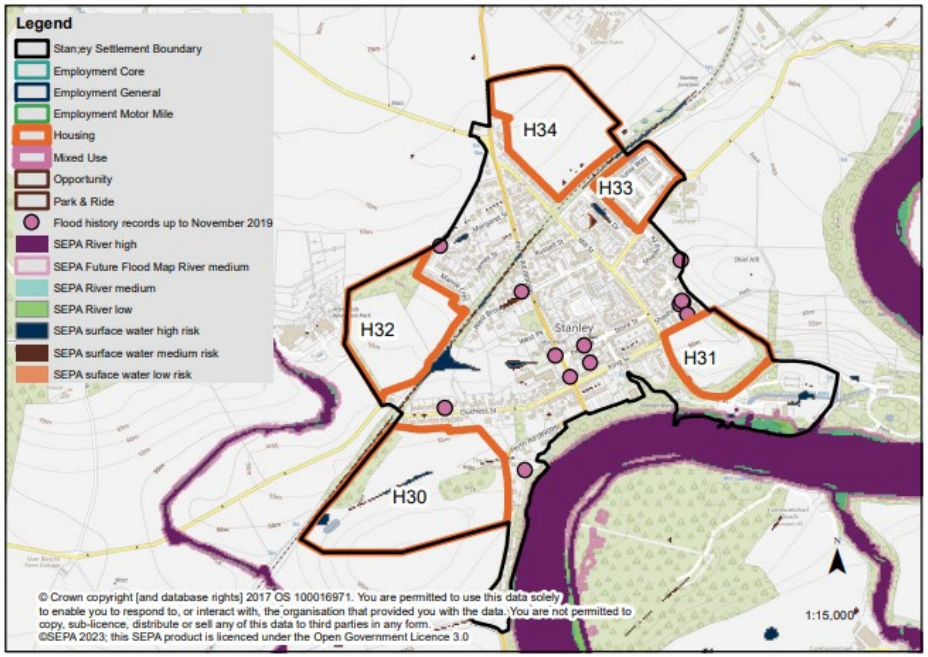


6.177 In terms of Natural Flood Management opportunities, there are no major opportunities but there are some minor ones. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Stanley

6.178 Stanley lies within a PVA. There are various flood event records, however the SEPA flood mapping does not greatly impact or constrain the LDP2 allocations, (see figure 91).

Figure 91 Stanley Flood risk

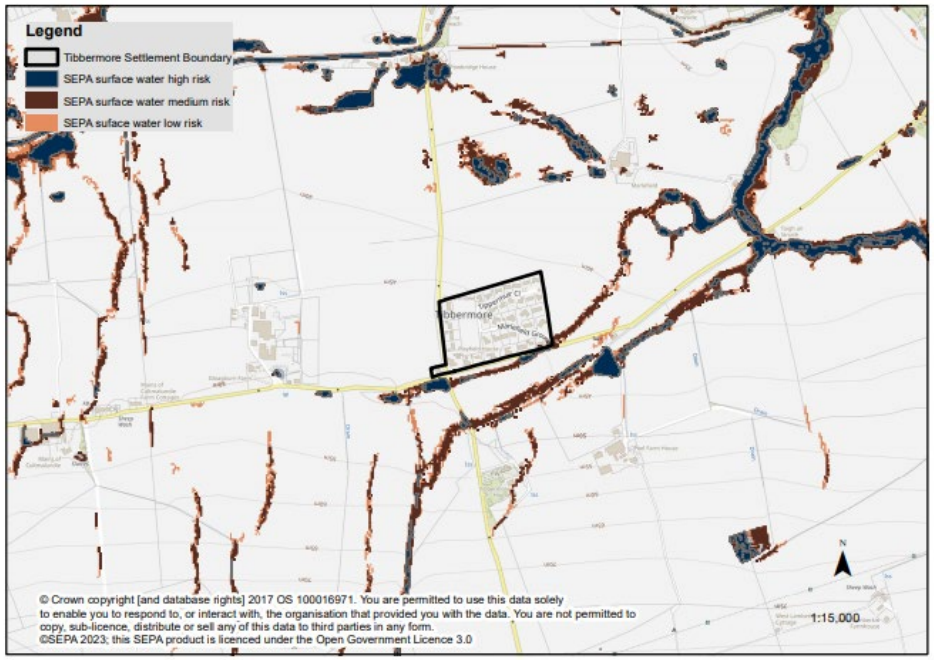


6.179 In terms of Natural Flood Management opportunities there are some sediment management opportunities related to sediment management on the River Tay and reducing runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Tibbermore

6.180 Tibbermore lies within the Perth and Almondbank PVA but is not a particularly badly affected part of this PVA. The settlement is only marginally affected by SEPA surface flood risk mapping as can be seen on figure 92.

Figure 92 Tibbermore Flood risk

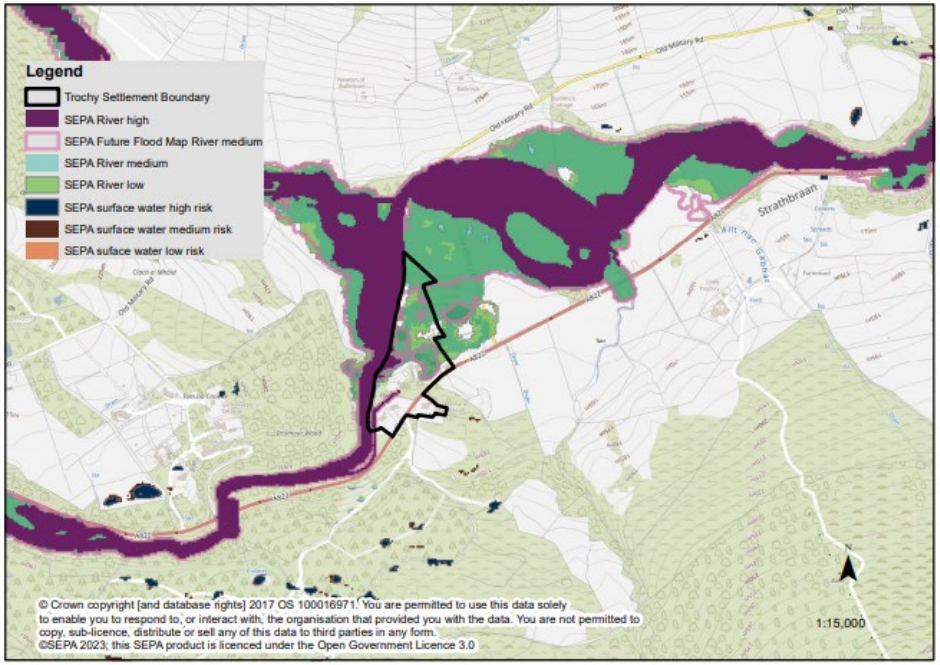


6.181 In terms of Natural Flood Management opportunities, there are no opportunities within the settlement, and the close by ones relate to surface water flood risk areas. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Trochry

6.182 Trochry does not lie within a PVA, and there are no flood event records, however it is significantly affected by SEPA flood risk mapping as can be seen on figure 93.

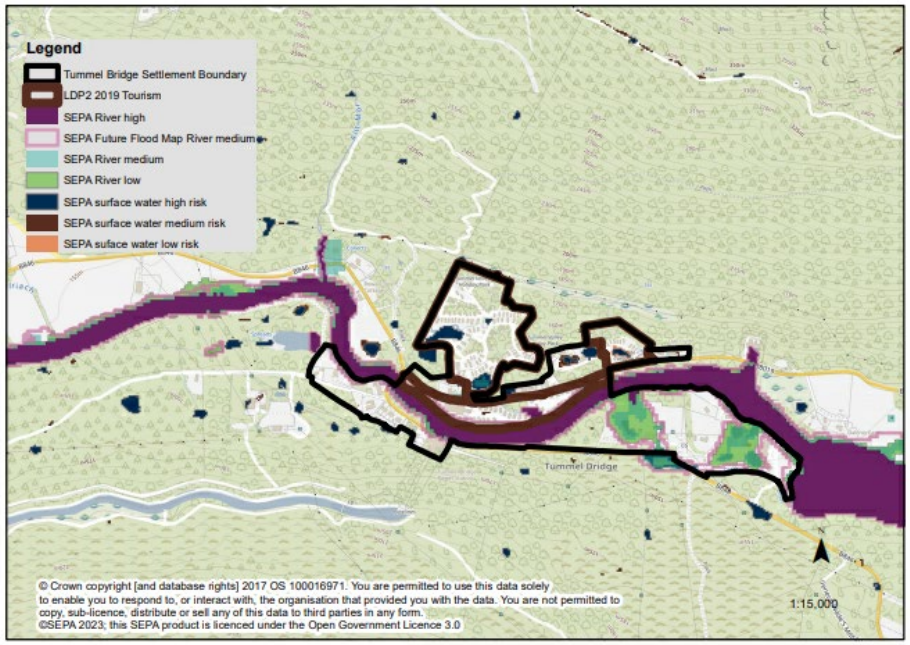
Figure 93 Trochry Flood risk



Tummel Bridge

6.183 Tummel Bridge does not lie within a PVA and there have been no flood events recorded, however the SEPA flood mapping does indicate the settlement is affected by flood risk from the River Tummel and some surface water flood risk (see figure 94.

Figure 94 Tummel Bridge Flood risk

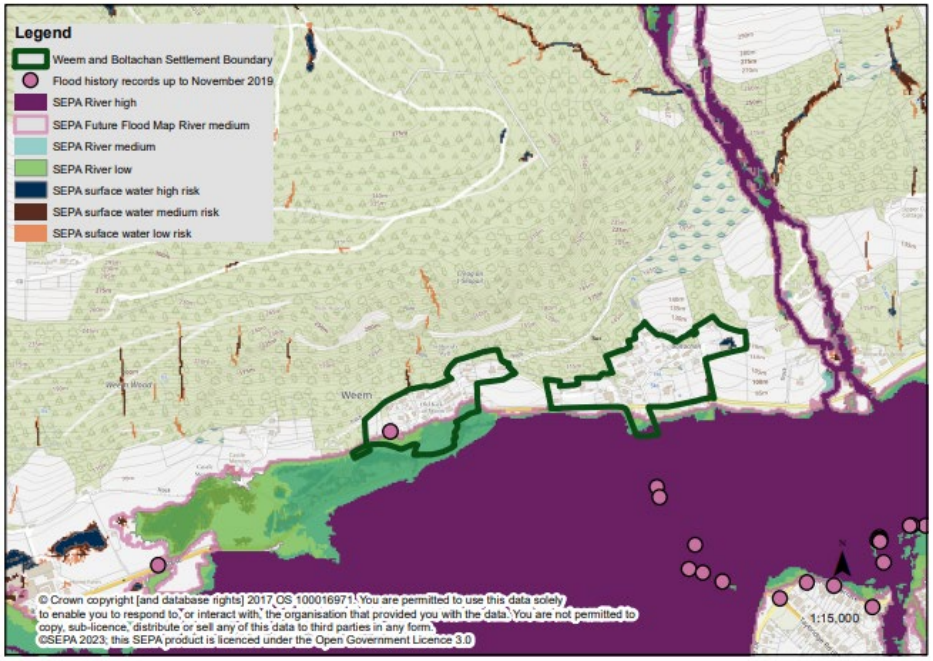


6.184 In terms of Natural Flood Management opportunities there are sediment management opportunities related to the River Tummel just outwith the settlement, and some surface water flood risk areas which may also have potential. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Weem and Boltachan

6.185 Weem and Boltachan lies within the Aberfeldy PVA. The main source of flooding in Weem is river flooding with a small proportion of risk coming from surface water. A flood protection scheme is in place that offers protection to the community. There are approximately 30 homes and businesses at risk from flooding. There is one flood event record a fluvial one which threatened a property on 6th December 2006. On the SEPA flood mapping the southern part of these communities are within the SEPA flood mapping extents on figure 95.

Figure 95 Weem and Boltachan Flood risk

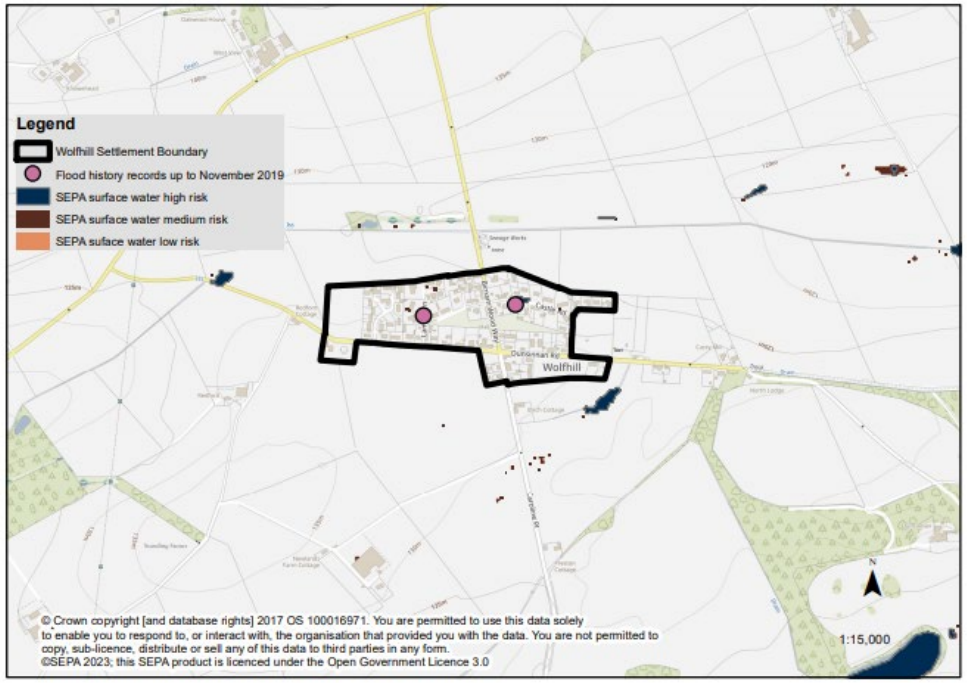


6.186 In terms of Natural Flood Management opportunities there is nothing with the settlements, but there are significant floodplain storage and runoff opportunities nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Wolfhill

6.187 Wolfhill does not lie within a PVA and is not greatly impacted by SEPA flood risk mapping (see figure 96). However there have been a couple of flood event records for a flooded road and garden.

Figure 96 Wolfhill Flood risk map

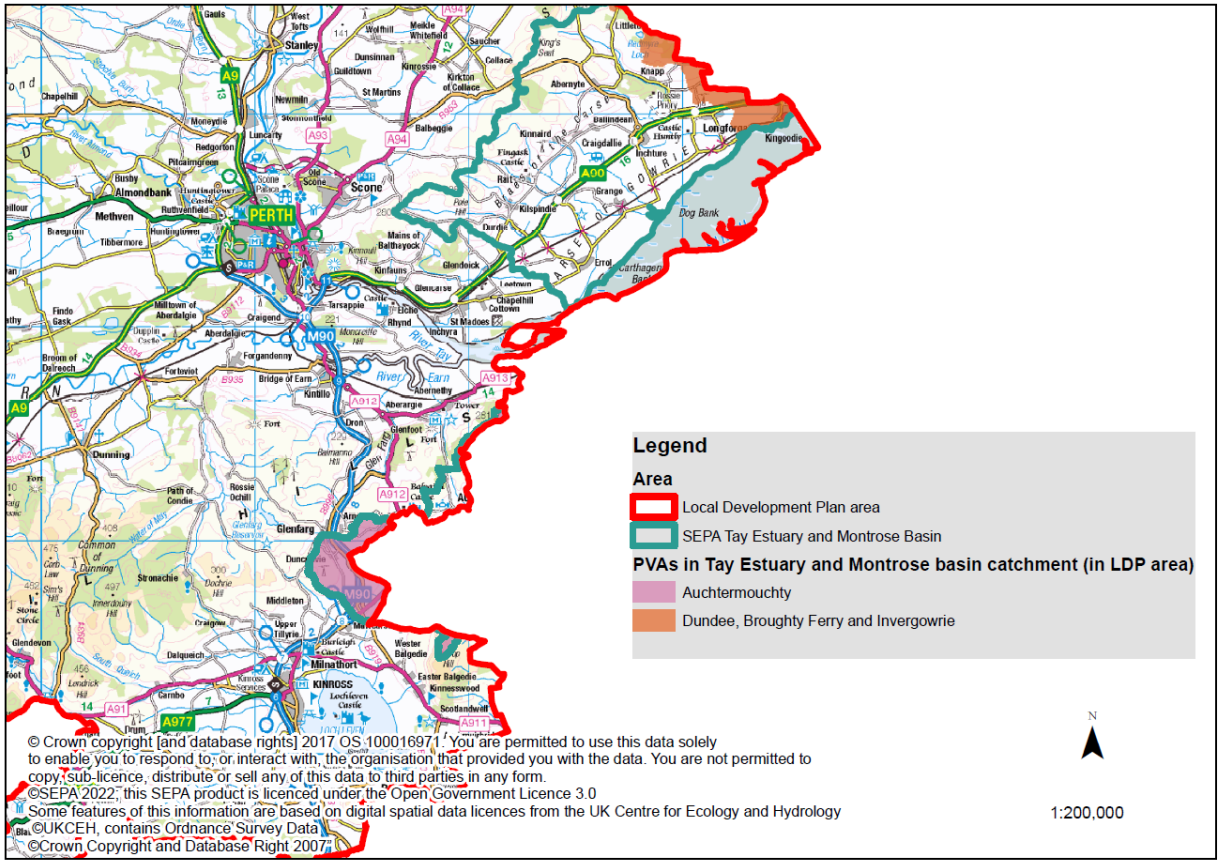


6.188 In terms of Natural Flood Management opportunities there is a sediment management opportunity outwith the settlement to the north associated to the Burrelton burn. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Outputs by Tay Estuary and Montrose Basin catchment area

6.189 This section provides results for the LDP2 Settlements in the Tay Estuary and Montrose Basin catchment. The settlements in this catchment are as follows: Baledgarno, Drunzie, Errol, Glenfarg, Grange and Errol Airfield, Inchture, Invergowrie, Kinnaird (Perth), Longforgan, and Rait

Figure 97 Tay Estuary and Montrose Basin PVAs within Perth and Kinross Council Local Development Plan Area

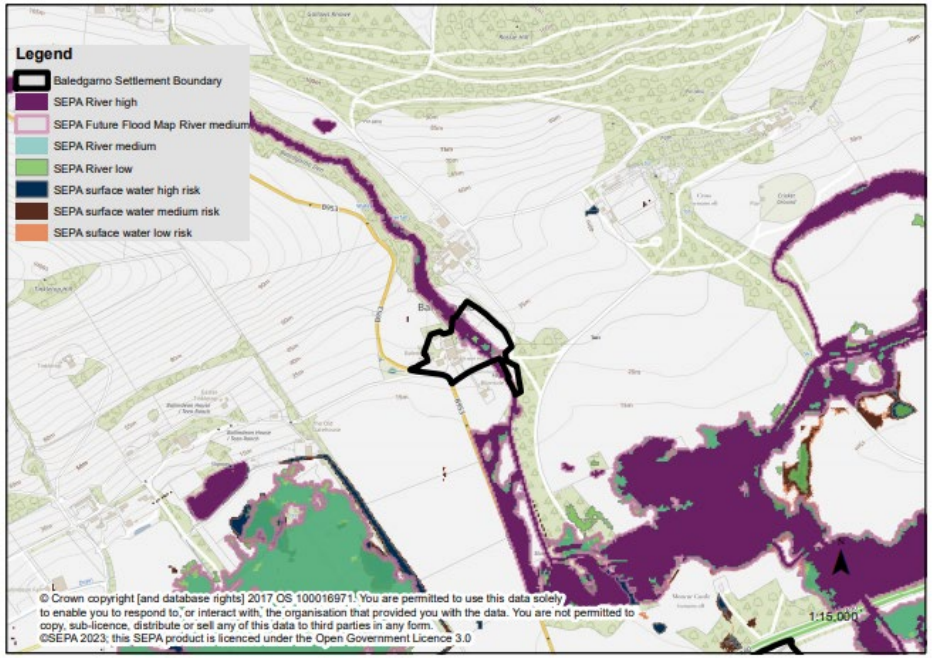


6.190 Outputs for how flood risk impacts on all these settlements, and the opportunities for natural flood management are provided as follows.

Baledgarno

6.191 Baledgarno does not lie within a PVA, and there are no flood risk records, however see figure 98, the settlement is affected by SEPA flood risk mapping relating to the Baledgarno burn which runs through the settlement.

Figure 98 Baledgarno Flood risk

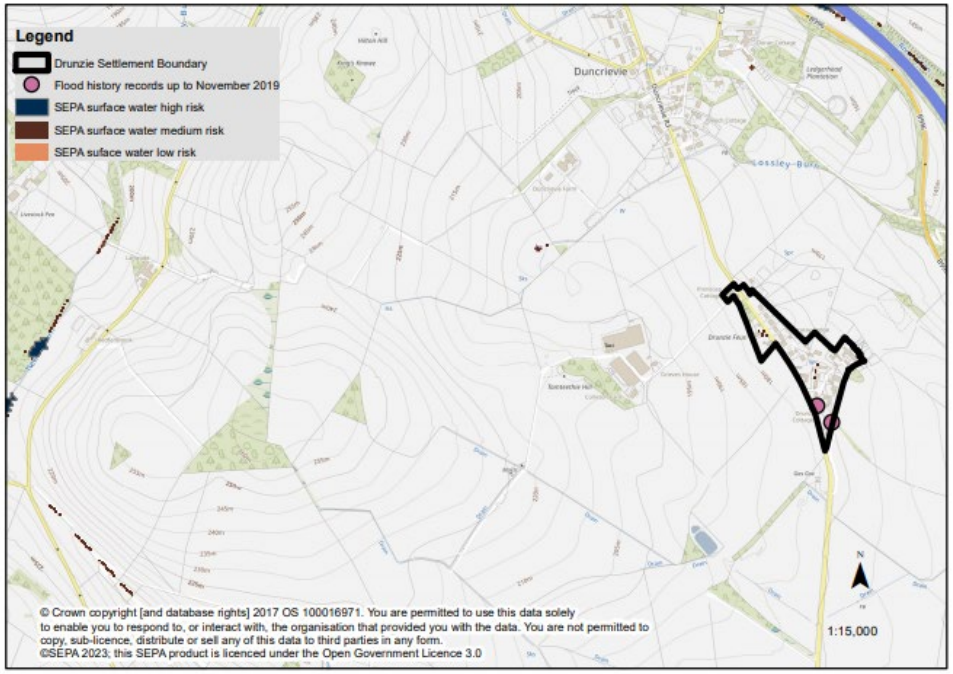


6.192 In terms of Natural Flood Management opportunities there are no opportunities within the settlement however there are substantial floodplain storage opportunities available to the south. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Drunzie

6.193 Drunzie lies within the Auchtermouchty PVA, but it is not a particularly badly affected area within this PVA. There are only very small areas of surface water flood risk within the settlement, see figure 99. On the 13th of December 2006 a pluvial flood event resulted in a couple of recorded flood events for property level and street level flooding.

Figure 99 Drunzie Flood risk

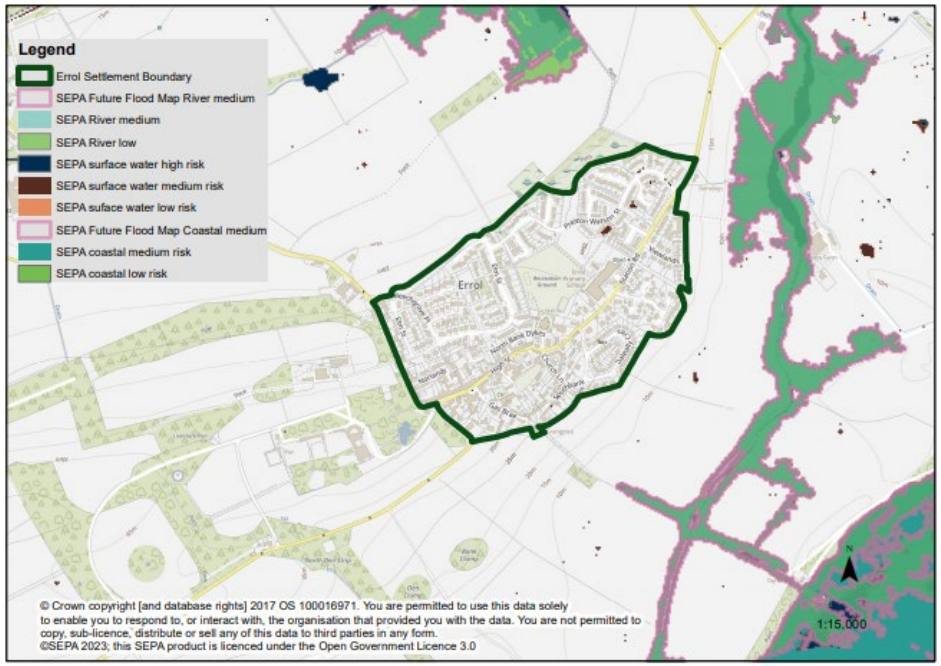


6.194 In terms of Natural Flood Management opportunities, there are no opportunities either within Drunzie itself or nearby.

Errol

6.195 Errol does not lie within a PVA, and there are no flood events recorded within Errol up to November 2019, also the SEPA flood mapping does not impinge much on Errol apart from some small areas of surface water flood risk (see figure 100). However, there was flooding of 3 properties on Gowrie Place on the 27th December 2023.

Figure 100 Errol Flood risk

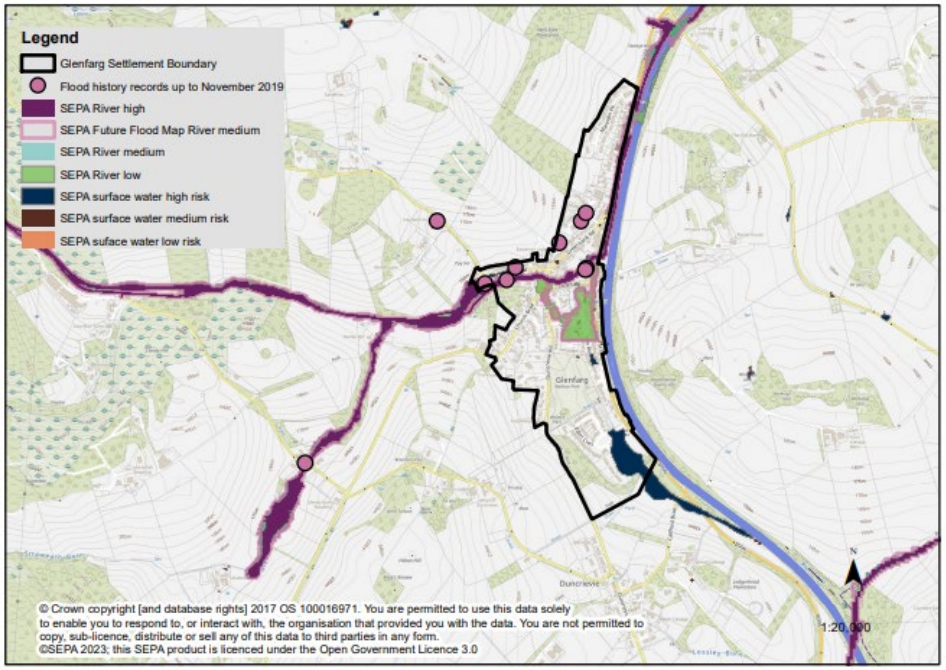


6.196 In terms of Natural Flood Management opportunities there is nothing within the settlement apart from some opportunity to reduce runoff, and to the south, there is some opportunity for floodplain storage and for wave energy dissipation. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Glenfarg

6.197 The southern half of Glenfarg lies within the Auchtermouchty PVA however it is not a particularly badly affected part of this PVA. It is affected by SEPA flood risk mapping particularly related to the River Farg, and to the south of the settlement in relation to surface water run off (see figure 101). There are quite a lot of flood events recorded in across various events, related to both street level and property level, and fluvial and pluvial.

Figure 101 Glenfarg Flood risk



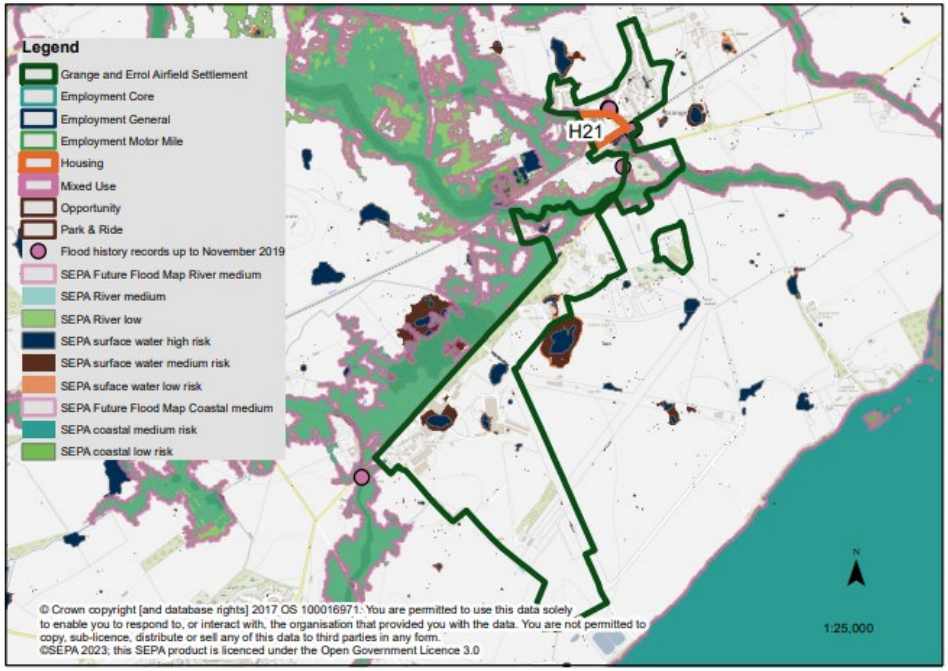
6.198 In terms of Natural Flood Management opportunities, the main opportunity might be that area of surface water flood risk to the south of the village or to reducing runoff to the north. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Grange and Errol Airfield

6.199 Grange and Errol Airfield does not lie within a PVA, however there is significant areas affected by SEPA river flood risk, and surface water flood risk (see figure 102). Also, there are a couple of flood events recorded, one at street level and ones at property level causing a flood house and garden. The LDP2 H21 allocation is affected by the indicative SEPA river flood risk mapping and would require an FRA at the planning application stage to consider which areas are developable.

6.200 In terms of Natural Flood Management opportunities there are some floodplain storage opportunities immediately to the north, whilst there are opportunity areas for wave dissipation to the south. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

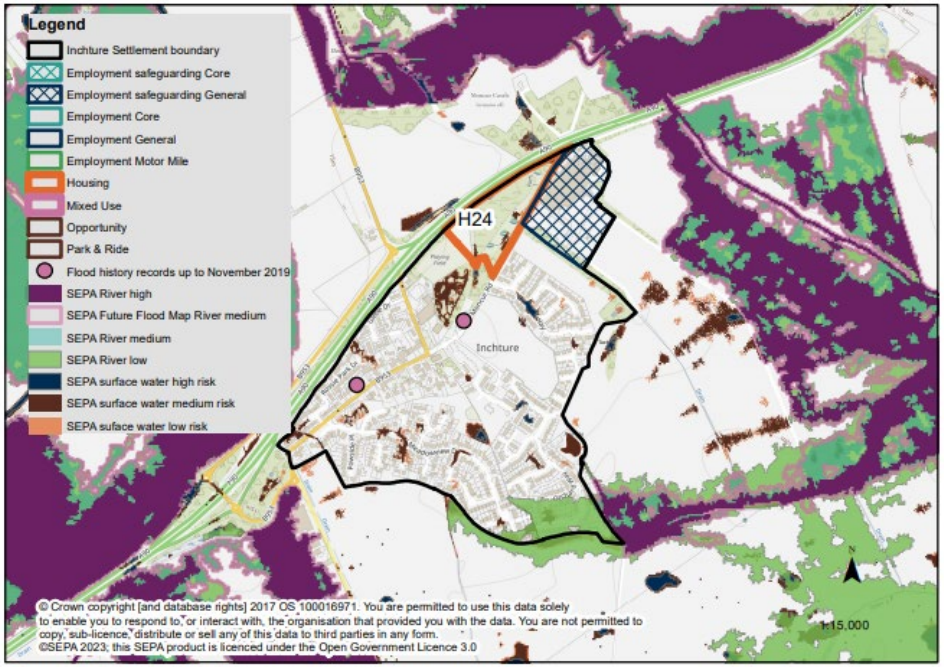
Figure 102 Grange and Errol Airfield Flood risk map



Inchture

6.201 Inchture does not lie within a PVA. The LDP2 H24 allocation has some surface water flood risk areas within it. Also the southeastern end is affected by river flood risk (see figure 103). It was subject to a planning application 17/00943/FLM for 74 homes and SuDs Pond was withdrawn. The couple of flood events recorded were both pluvial and both were property level events related to individual properties.

Figure 103 Inchture Flood risk



6.202 In terms of Natural Flood Management opportunities, there may be some opportunities related to the SEPA surface water flood risk areas within the settlement, and outwith there are significant floodplain storage opportunity areas. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

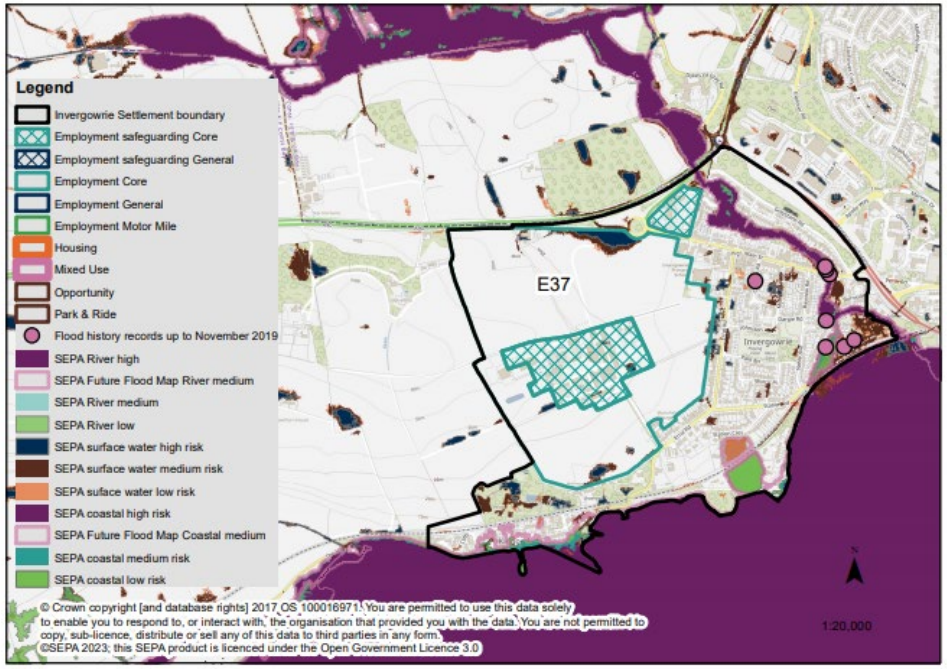
Invergowrie

6.203 Invergowrie lies within the Dundee, Broughty Ferry and Invergowrie PVA. There are approximately 190 residential properties and 80 non-residential properties at risk of flooding in this PVA. Most of the flood risk in the Invergowrie area originates from fluvial sources of flooding. Several flood studies have been undertaken within Invergowrie, most recently that by Mouchel in 2007. No viable traditional (flood walls and bunds) flood scheme was identified in these studies.

6.204 Parts of the settlement are affected by SEPA flood risk mapping, and by flood event records, including parts of the LDP2 E37 allocation, as can be seen in figure 104. Parts of this allocation have secured planning permission, but LDP3 will need to consider this site, and an FRA requirement.

6.205 October 19th, 2023, resulted in 6 internal properties and 10 properties experiencing solum flooding, and 5 garages being flooded on Alastair Soutar Crescent, Main St, Boniface Road, and Station Road.

Figure 104 Invergowrie Flood risk map



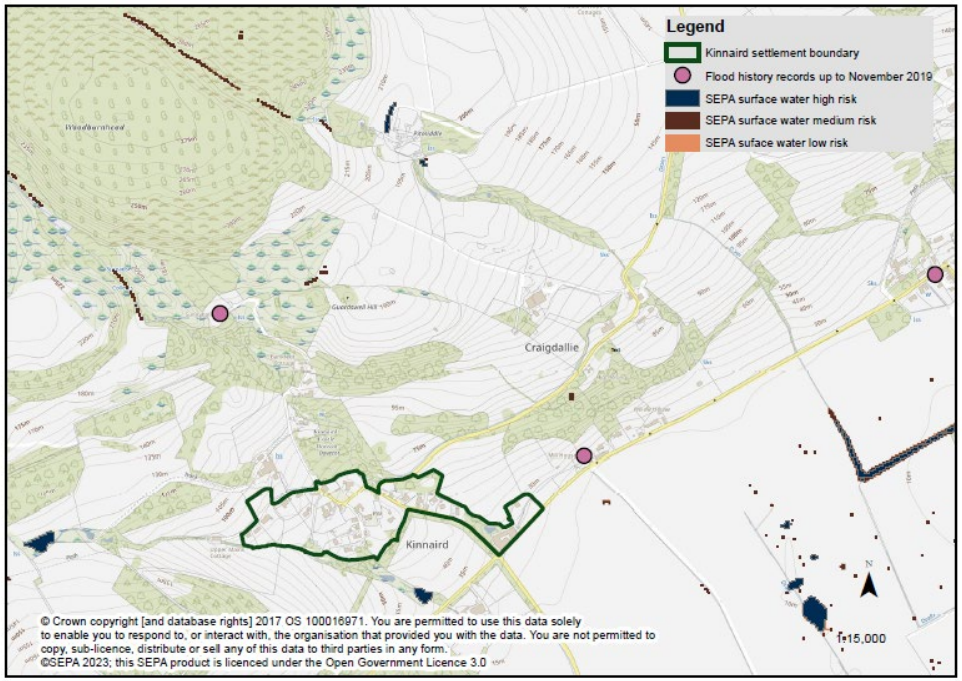
6.206 In terms of Natural Flood Management opportunities there are opportunities related to surface water at risk areas, sediment management (for Fowlis Burn), and to wave energy dissipation which can be seen, whilst there are also opportunities for surge attenuation. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

6.207 The Invergowrie Natural Flood Management study was completed October 2023. Unfortunately, Invergowrie Burn is classified as moderate in its Water Framework Directive (WFD) condition and is currently failing its RBMP objectives. Measures which restore the natural function of the watercourse and reconnect the floodplain, in conjunction with the management of runoff, were judged to have the greatest potential to improve the WFD status to good, as required. However the Fowlis Burn catchment was identified as the critical watercourse in terms of potential for Natural Flood Management measures and was the focus for the study. Distributed catchment-wide measures were also considered. The study concluded that, given the lack of gauging data and large uncertainty in terms of the hydrology and modelling, a stronger evidence base would be required before any options were supported. Given this and the results from the economic appraisal none of the short-listed options were considered feasible and progressed further.

Kinnaird

6.208 Kinnaird does not lie within a PVA, and the settlement is not affected by SEPA flood risk mapping or by flood risk event records as can be seen on figure 105.

Figure 105 Kinnaird Flood risk

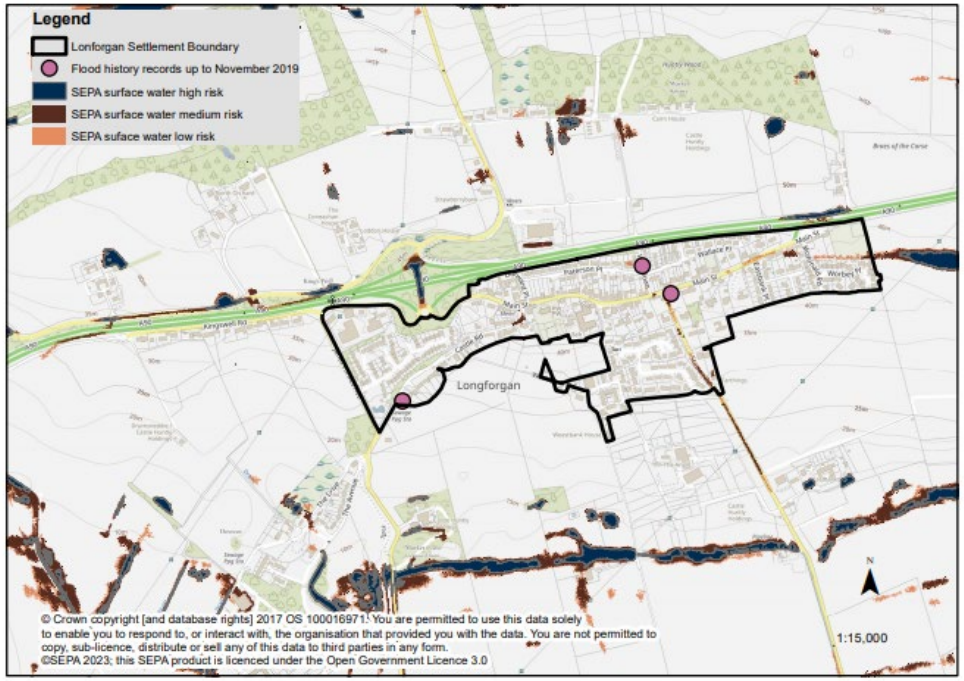


6.209 In terms of Natural Flood Management opportunities there may be some opportunity to reduce runoff closeby to the north of the settlement and to east at Craigdallie. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Longforgan

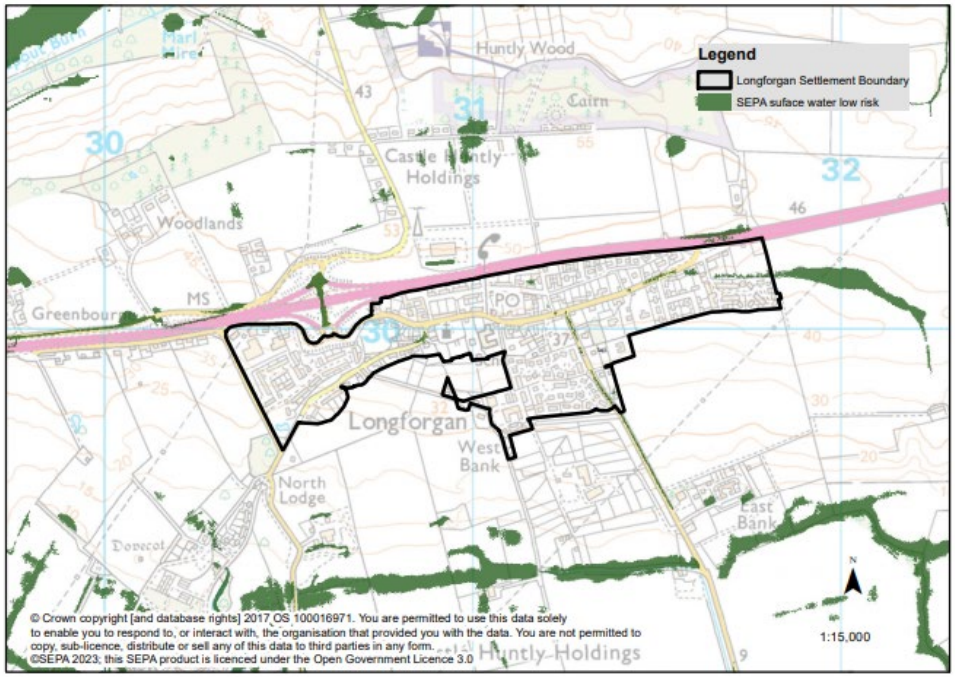
6.210 Longforgan does not lie within a PVA. There are a few floods event records a couple of street level records in the centre of Longforgan and a property level sewer flooding event affecting a property to the southwest, on Castle Road as can be seen on figure 106. Also there is a minimal impact from SEPA surface water flood risk mapping.

Figure 106 Longforgan Flood risk map



6.211 In terms of Natural Flood Management opportunities, the surface water flood risk mapping shows areas which may have potential (see figure 107).

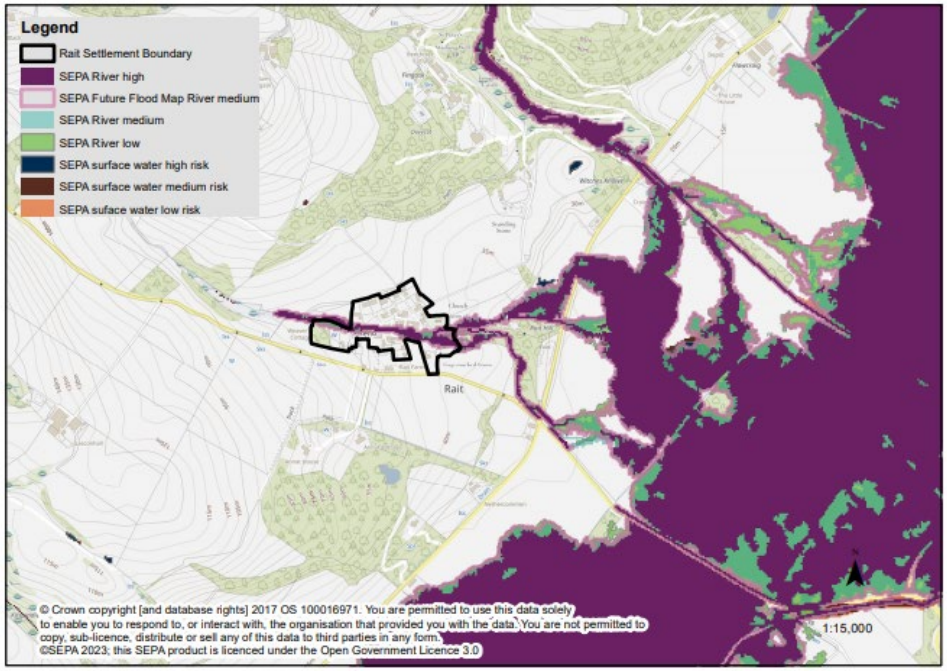
Figure 107 Longforgan Natural Flood Management Opportunities



Rait

6.212 Rait does not lie within a PVA, and there are no flood event records, however there is SEPA river flood risk associated to the Rait burn (see figure 108).

Figure 108 Rait Flood risk

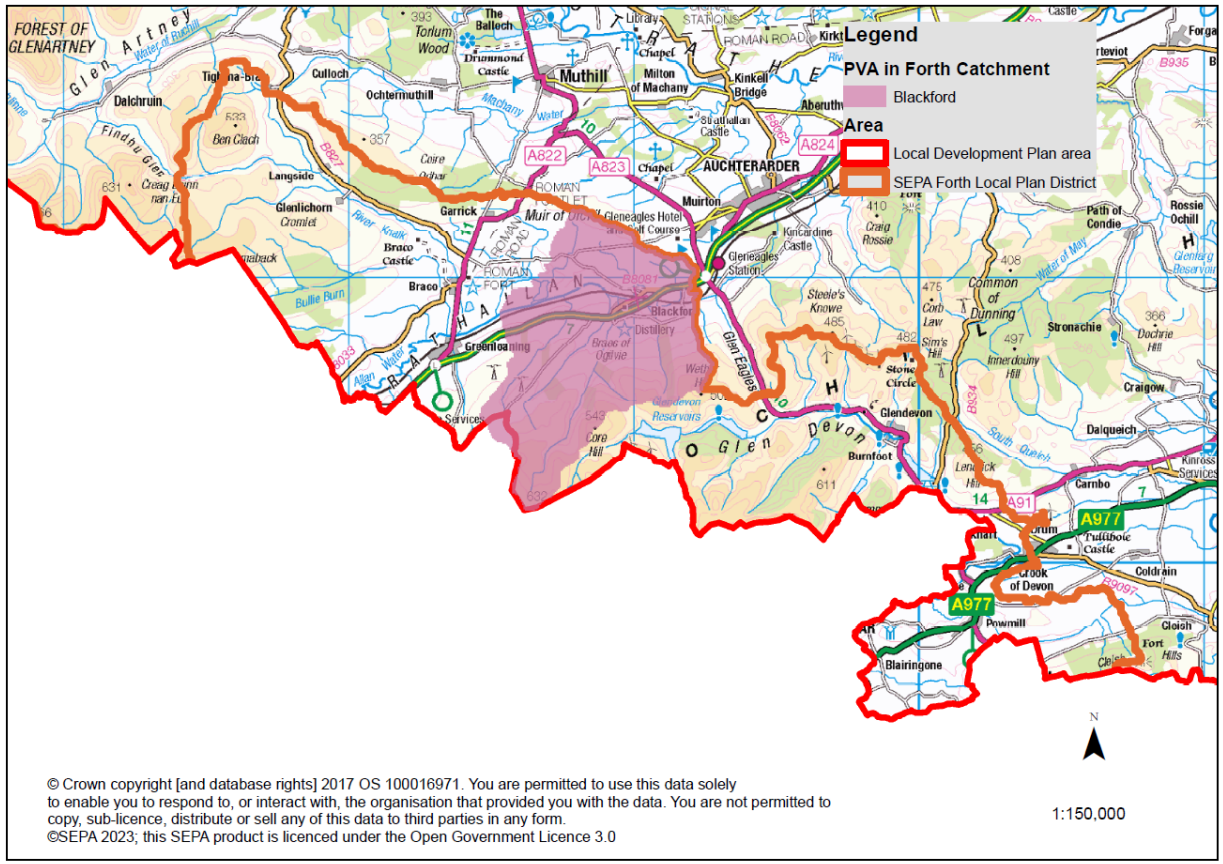


6.213 In terms of Natural Flood Management opportunities there are no opportunities within the settlement but there are significant floodplain storage opportunities to the east. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Outputs by Forth catchment area

6.214 This section provides results for the LDP2 Settlements in the Forth catchment. The settlements in this catchment are as follows: Blackford, Blairingone, Braco, Greenloaning, Powmill, Rumbling Bridge

Figure 109 Forth Catchment PVA within Perth and Kinross Council Local Development Plan Area



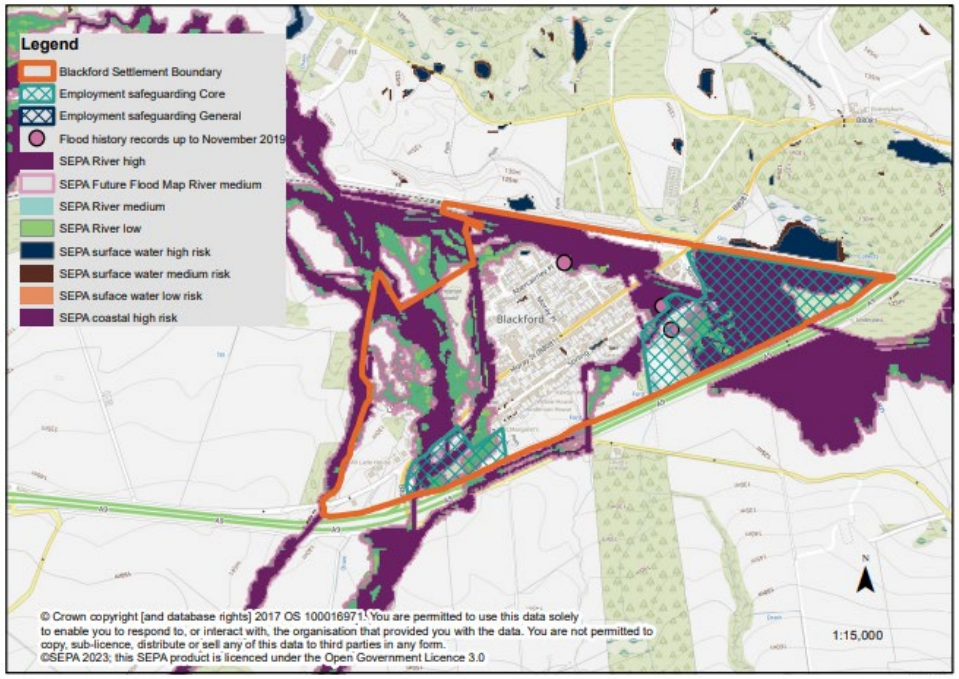
6.215 Outputs for how flood risk impacts on all these settlements, and the opportunities for natural flood management are provided as follows.

Blackford

6.216 Blackford lies within a PVA. The main source of flooding in Blackford is river flooding from the Danny Burn and other small watercourses. There is some history of flooding. Most recently, two homes and one business were flooded in February 2020, while high flow events occurred in August 2019 and February 2021. Perth and Kinross Council has carried out a flood study in this area which estimated that there are approximately 32 homes and 6 businesses currently at risk from flooding. A flood protection scheme has been proposed in this area. The proposed scheme involves a combination of river flow diversions, direct flood defences and natural flood management. The delivery of this scheme is subject to capital funding being made available by the Scottish Government and within Perth and Kinross Council's capital programme.

6.217 The settlement is significantly affected by river flood risk related to the Allan Water as can be seen on figure 110. There was a property level fluvial flood event record from 26th February 2017 which affected the Highland Spring premises, and a house flooded on 29th November 2011, whilst a pluvial event caused localised flooding at street level at Abercairney Place.

Figure 110 Blackford Flood risk

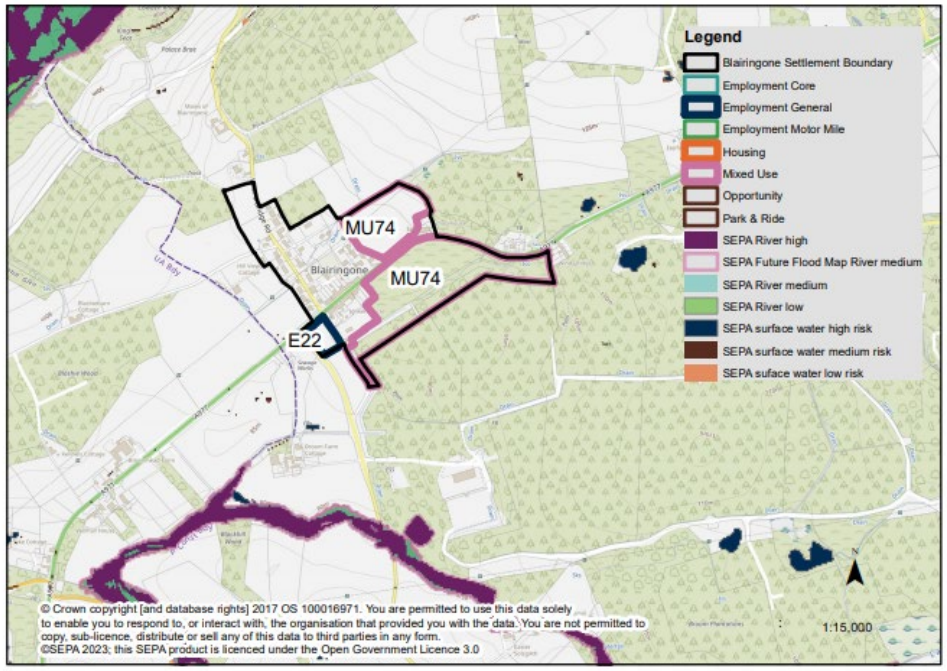


6.218 In terms of Natural Flood Management opportunities there is both substantial floodplain management and sediment management opportunities related to the Allan Waters. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer. Also the Blackford flood study was carried out in 2020 which identified Natural Flood Management as part of the preferred option. The Natural Flood Management could aid in storing flows within the upstream catchment as well as having wide catchment benefits. It is suggested that if alternative options are put in place to enable flood risk reduction, natural flood management measures could be incorporated later to provide some additional attenuation to the higher flows predicted as part of future climate change. Areas where Natural Flood Management may be considered include north and south of Drumfad on the Allan Water. The delivery of this scheme is subject to capital funding being made available by the Scottish Government and within Perth and Kinross Council's capital programme.

Blairingone

6.219 Blairingone does not lie within a PVA, and there are no flood events recorded, whilst the SEPA flood mapping does not impact on the settlement, or the LDP2 allocations, see figure 111.

Figure 111 Blairingone Flood risk

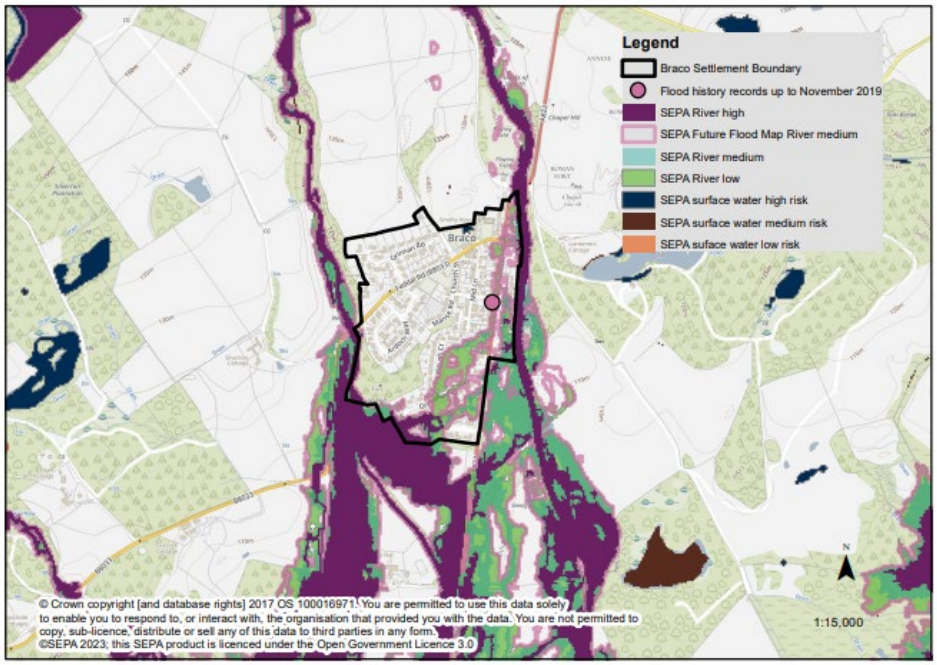


6.220 In terms of Natural Flood Management opportunities, within the settlement the main opportunity relates to reducing runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Braco

6.221 Braco does not lie within a PVA, however it is significantly affected especially to the east by SEPA river flood risk see on figure 112. You can also see the flood risk record from 13th December 2006, from groundwater, which affected Braco Hotel and flooded their beer cellar.

Figure 112 Braco Flood risk

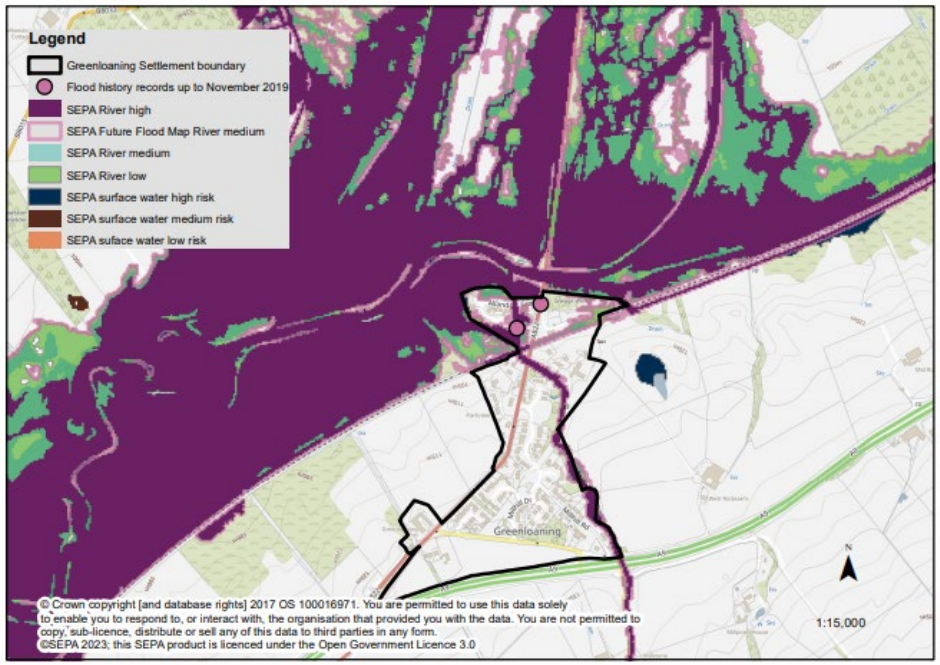


6.222 In terms of Natural Flood Management opportunities there are floodplain storage opportunities within Braco and sediment management and other opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Greenloaning

6.223 Greenloaning does not lie within a PVA. The settlement is however affected by SEPA flood risk mapping for the Allan Water (see figure 113). Also there is a couple of flood event records to the north of Greeenloaning, both pluvial (property level) and fluvial (street level).

Figure 113 Greenloaning Flood risk map

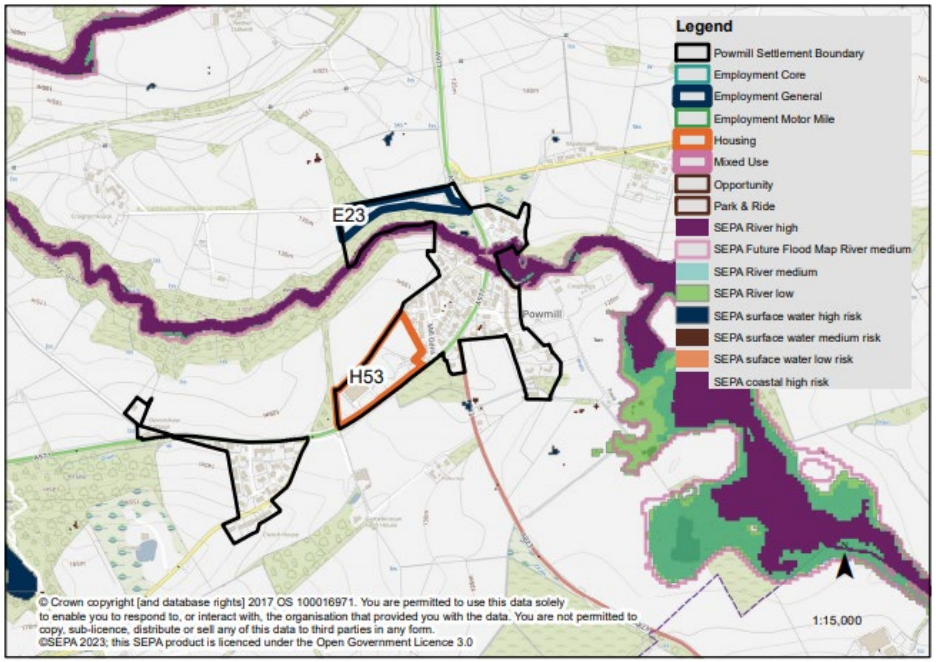


6.224 In terms of Natural Flood Management opportunities there is nothing within the settlement but there are significant sediment management and floodplain storage opportunities to the north. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Powmill

6.225 Powmill does not lie within a PVA, and there are no flood event records, however there are areas affected by SEPA flood mapping particularly in relation to the Gairney Burn as can be seen on figure 114. The LDP2 H53 and E23 allocations are outwith the SEPA flood risk areas.

Figure 114 Powmill Flood risk

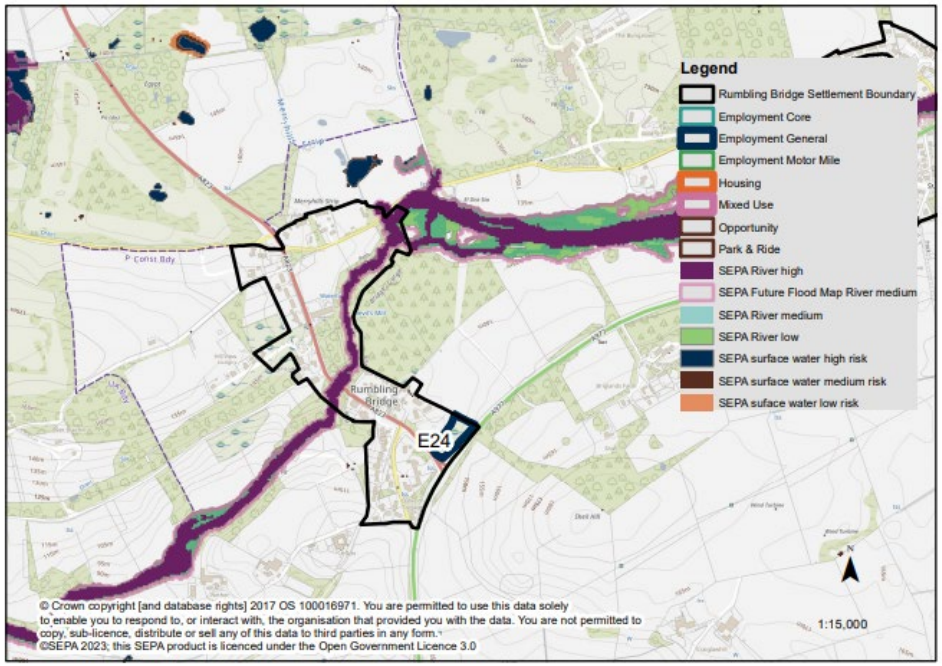


6.226 In terms of Natural Flood Management opportunities there are some surface water flood risk and reduction of runoff opportunities. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Rumbling Bridge

6.227 Rumbling Bridge does not lie within a PVA. The settlement is affected by SEPA river flood risk extents associated to the River Devon (see figure 115). The LDP2 allocation E24 is not affected by flood risk.

Figure 115 Rumbling Bridge Flood risk

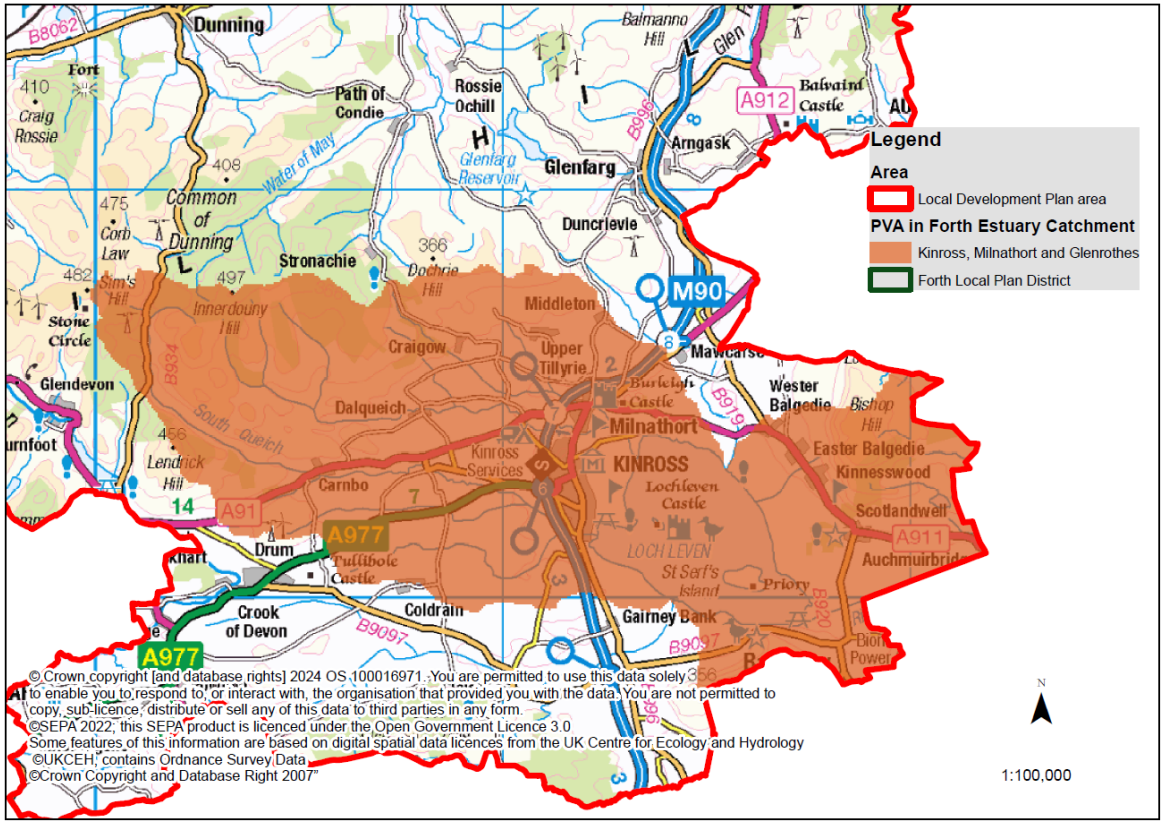


6.228 In terms of Natural Flood Management opportunities there is sediment management opportunity relating to the River Devon, and surface water, and runoff reduction opportunities to the north and west. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Outputs by Forth estuary catchment area

6.229 This section provides results for the LDP2 Settlements in the Forth estuary area. The settlements in this catchment are as follows: Balado, Carnbo, Cleish, Crook of Devon and Drum, Glenlomond, Greenacres, gWest, Hattonburn, Keltybridge and Maryburgh, Kinnesswood, Kinross and Milnathort, Ochil Hills Hospital, Scotlandwell and Kilmagadwood, Wester Balgedie

Figure 116 Forth Catchment PVA within Perth and Kinross Council Local Development Plan Area

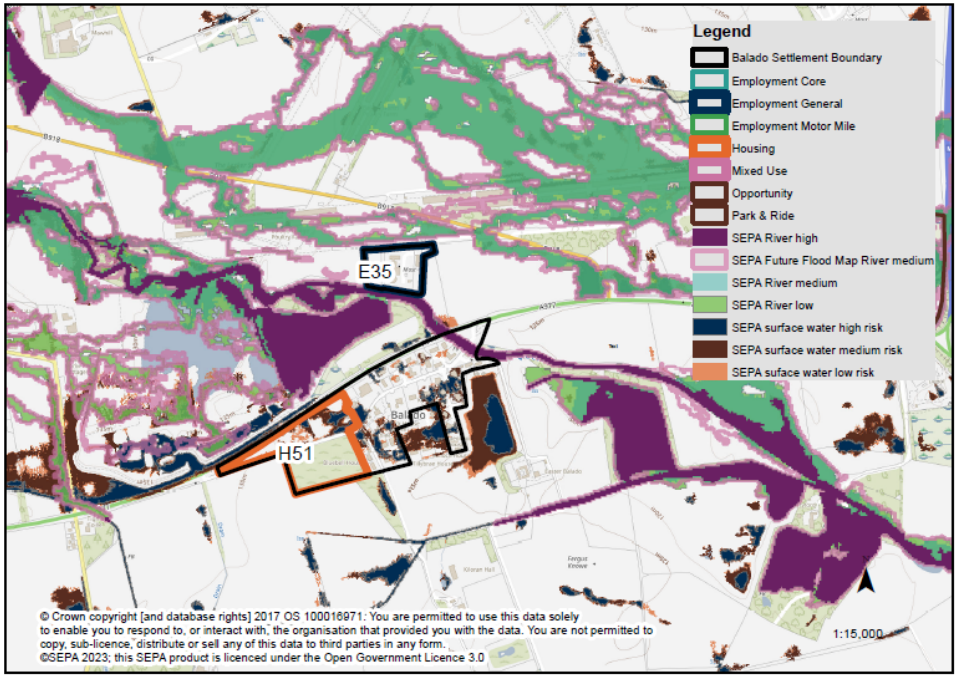


6.230 Outputs for how flood risk impacts on all these settlements, and the opportunities for natural flood management are provided as follows.

Balado

6.231 Balado lies within the wider Kinross, Milnathort and Glenrothes PVA, but it is not within one of three focus areas identified for this PVA. There are no flood risk event records for Balado. The settlement is significantly impacted by SEPA surface water flood risk mapping (see figure 117). The LDP2 H51 allocation is affected by surface water risk, but this has been considered through the planning application process, with detailed permission having been granted for that northern triangle of the site 21/01107/FLL for 9 homes. This was subject to consideration of a FRA, and it was approved on the 21st of August 2023. LDP2 E35 lies outwith at risk areas, but there is an FRA requirement for this allocation.

Figure 117 Balado Flood risk

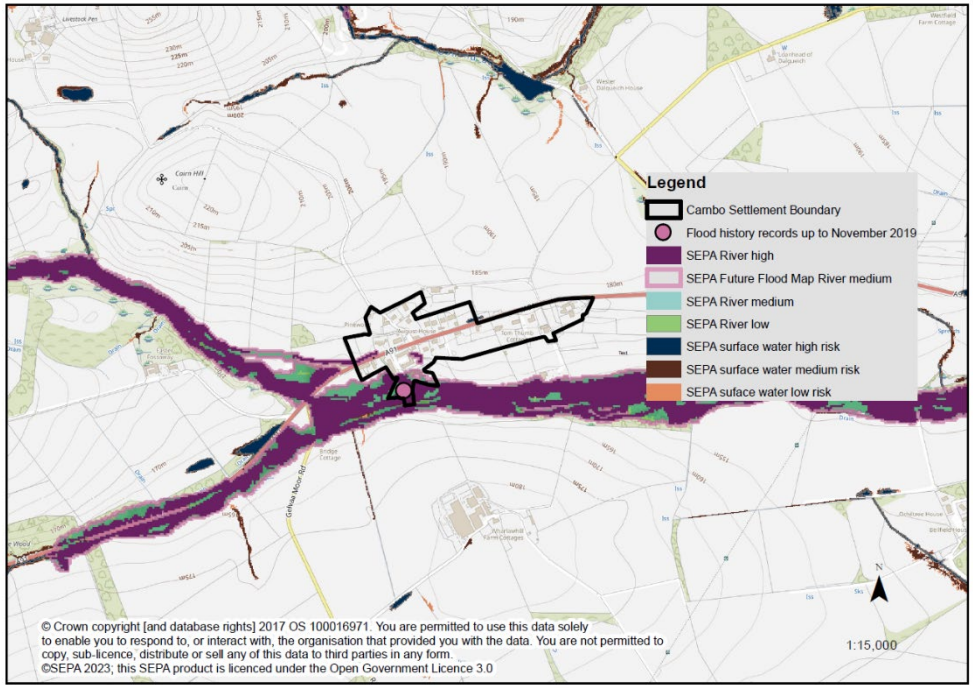


6.232 In terms of Natural Flood Management opportunities within Balado there are significant opportunities related to surface water flood risk areas and sediment management opportunity. There is also floodplain storage opportunity nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Carnbo

6.233 Carnbo lies within the wider Kinross, Milnathort and Glenrothes PVA, but it is not within one of three focus areas identified for this PVA. The settlement is affected by SEPA river flood risk extents at its southern extent in relation to the South Queich (see figure 118). On 13th December 2011 there was a flood event record for a property level event.

Figure 118 Carnbo Flood risk

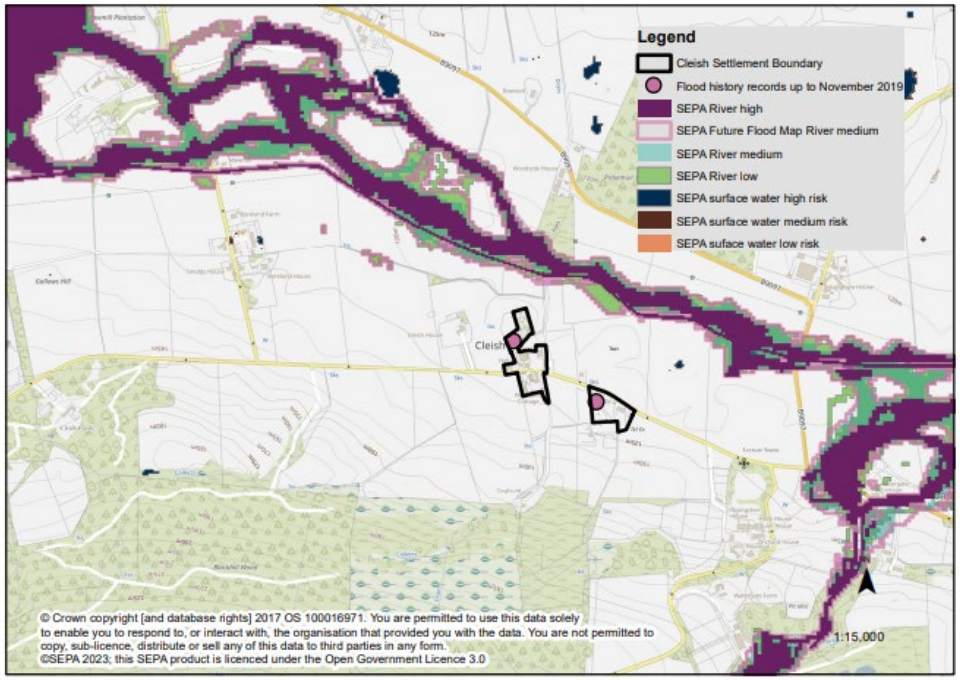


6.234 In terms of Natural Flood Management opportunities there are surface water flood risk areas within the settlement, and outwith there are sediment management areas, floodplain management, and runoff reduction areas. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Cleish

6.235 Cleish does not lie within a PVA. There are a couple of fluvial flood event records, both for property level event which flooded 2 properties on 4th January 2011, which can be seen on figure 119. However the village is not affected by the SEPA flood risk mapping extents.

Figure 119 Cleish Flood risk

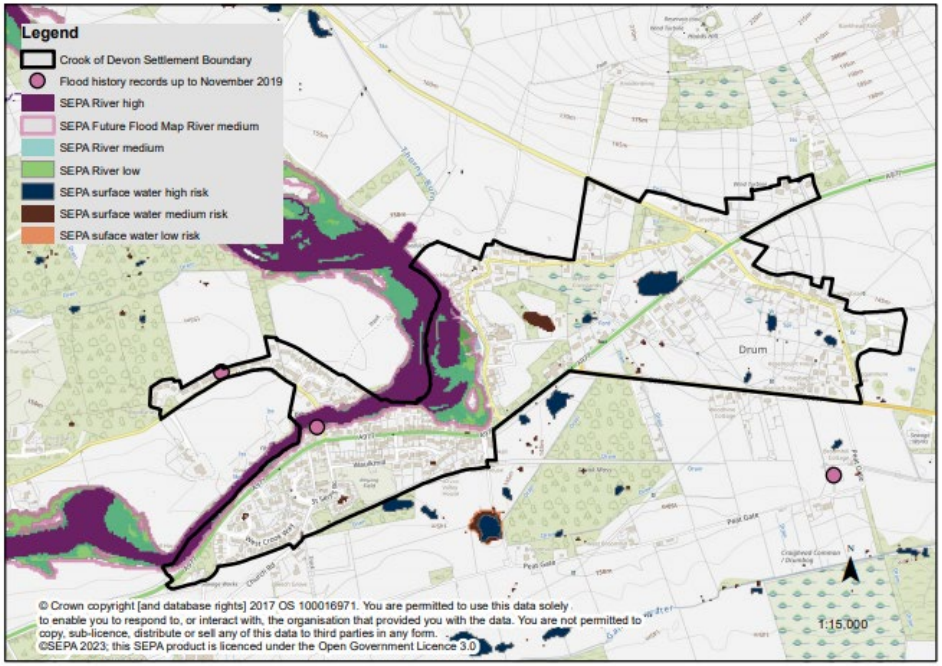


6.236 In terms of Natural Flood Management opportunities, there are floodplain storage opportunities to the north and runoff reduction opportunities within and to the south. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Crook of Devon and Drum

6.237 Crook of Devon and Drum does not lie within a PVA. There are a couple of flood event records, one property at Naemoor Road had property scale event on 14th December 2006, whilst there was a property level event to the north on February 26th, 2017, from a surface water flood event. Also, the SEPA river flood risk and surface water flood risk extents do have an impact (see figure 120).

Figure 120 Crook of Devon and Drum Flood risk

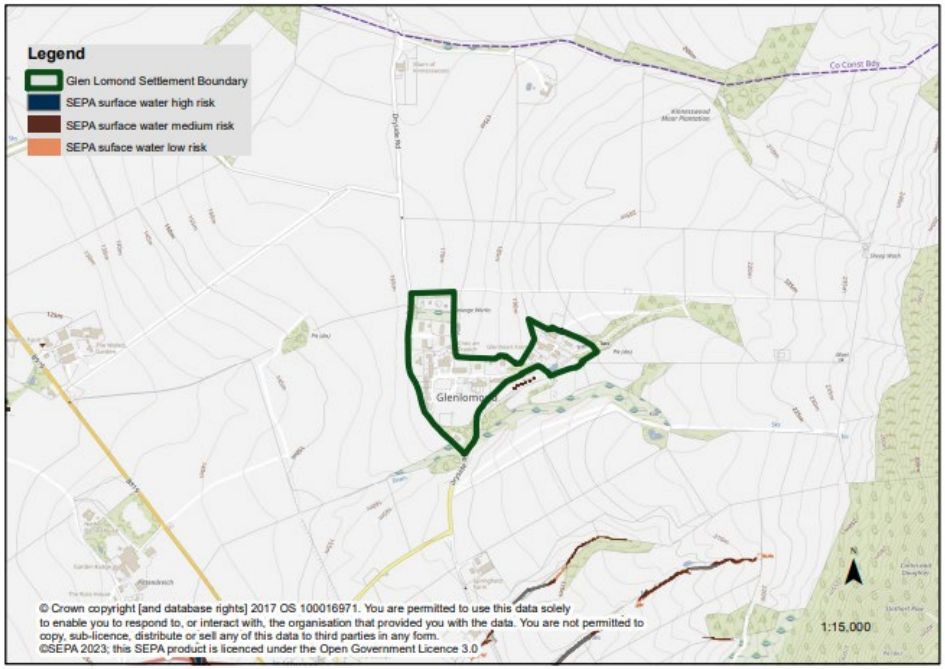


6.238 In terms of Natural Flood Management opportunities there are opportunities within the settlement related to surface water flood risk areas, and sediment management. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Glenlomond

6.239 Glenlomnd does not lie within a PVA, and it is not affected by SEPA flood risk mapping or records of events, there is only some minor areas of surface water flood risk nearby (see figure 121).

Figure 121 Glenlomond Flood risk

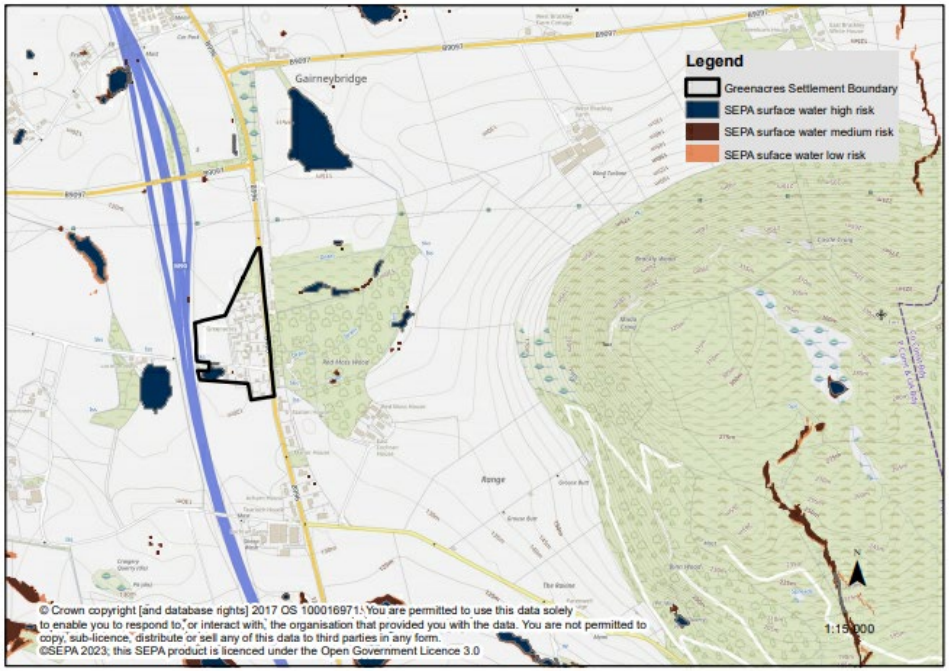


6.240 In terms of Natural Flood Management opportunities there is no opportunity within the settlement and very limited opportunity nearby. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Greenacres

6.241 Greenacres does not lie within a PVA, and there are no recorded flood risk events. There is limited impact from SEPA flood risk mapping, with some surface water flood risk at the southern end of Greenacres, see figure 122.

Figure 122 Greenacres Flood risk

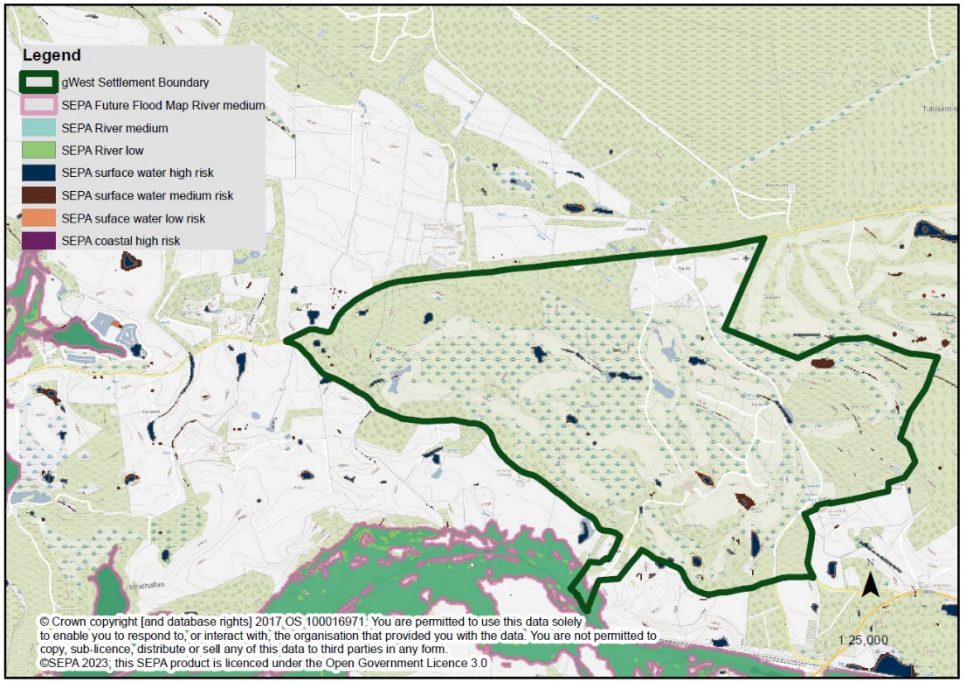


6.242 In terms of Natural Flood Management opportunities, there may be some minor opportunities relating to surface water flood risk within the settlement and outwith. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

gWest

6.243 gWest lies within the Blackford PVA, but it is not a particularly badly affected part of the PVA. There is no flood event history for gwest. There is some SEPA surface water flood risk which covers small discrete areas, and a marginal part of the southern extent includes some river flood risk, see figure 123.

Figure 123 gWest Flood risk

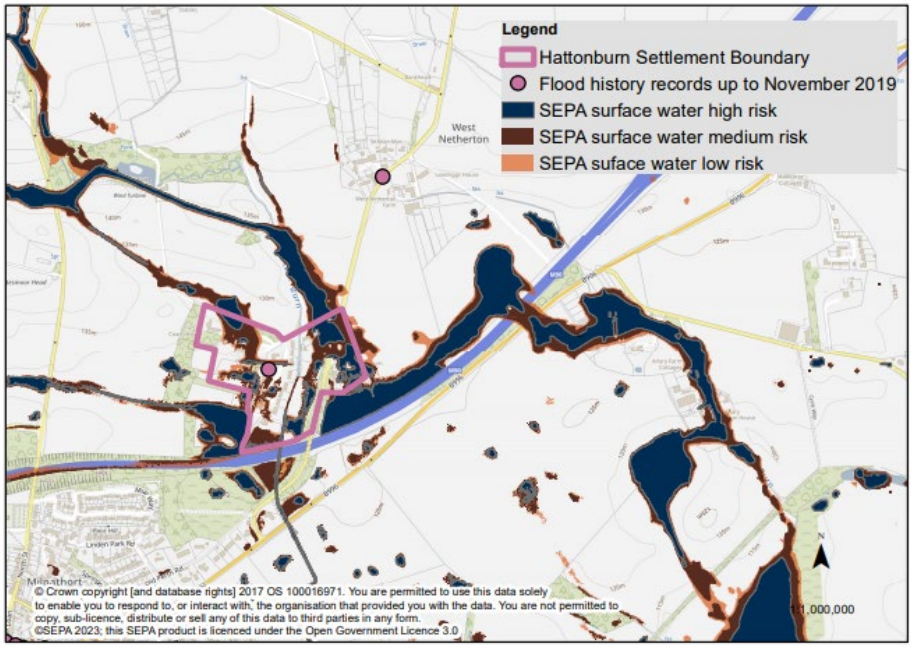


6.244 In terms of Natural Flood Management opportunities there may be some opportunity reduce runoff within gWest and there are some surface water flood risk areas which may also offer opportunity, whilst outwith gWest to the south there are floodplain storage and sediment management opportunities related to the Allan Water. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Hattonburn

6.245 Hattonburn lies within the Kinross, Milnathort and Glenrothes PVA. It is not within one of the target areas for the PVA. As can be seen on figure 124 it is significantly impacted by SEPA surface water flood risk.

Figure 124 Hattonburn Flood risk

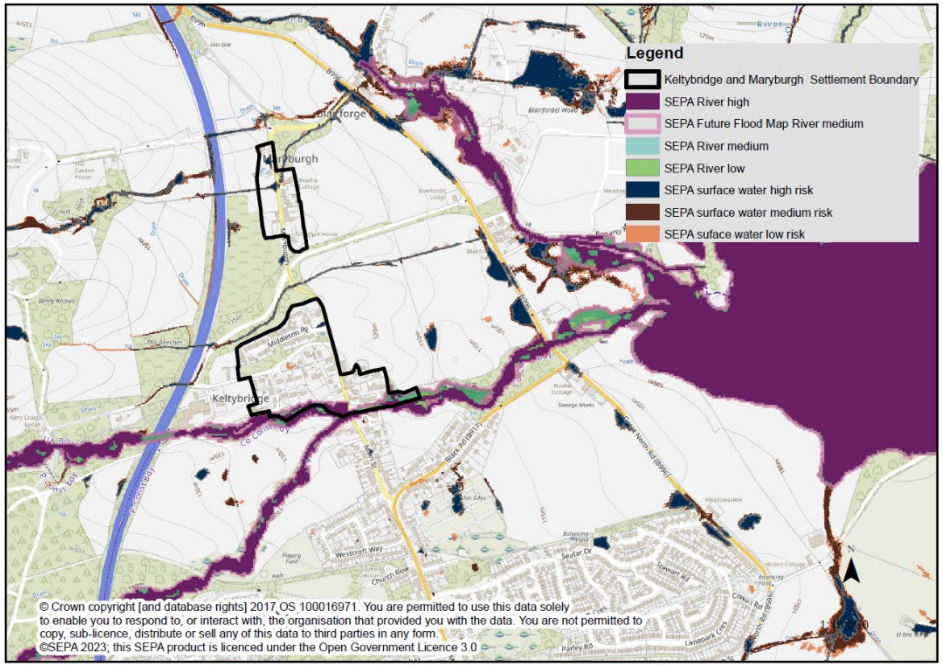


6.246 In terms of Natural Flood Management opportunities, there may be some potential related to surface water flood risk areas and to floodplain storage. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Keltybridge and Maryburgh

6.247 Keltybridge and Maryburgh do not lie within a PVA, and there are no flood event records either. The settlements are both impacted by SEPA river flood risk mapping (see figure 125).

Figure 125 Keltybridge and Maryburgh Flood risk map

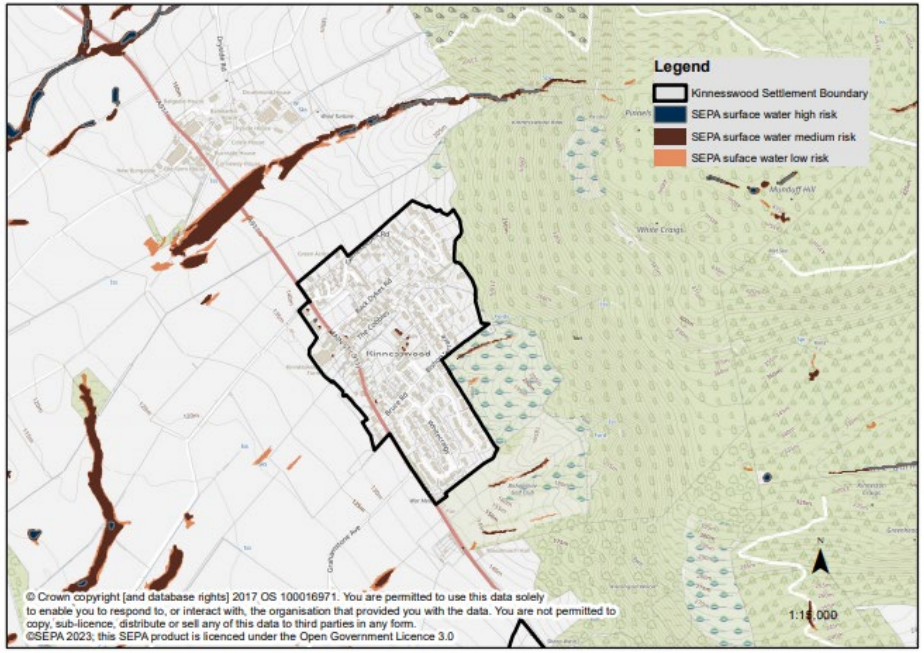


6.248 In terms of Natural Flood Management opportunities the settlements both have opportunity for recuing runoff, and there are opportunities outwith relating to surface water run off as well. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Kinnesswood

6.249 Kinnesswood lies within the Kinross, Milnathrot and Glenrothes PVA, and there are no flood event records. The settlement has some minor areas of surface water flood risk (figure 126).

Figure 126 Kinnesswood Flood risk map



6.250 In terms of Natural Flood Management opportunities there are limited opportunities within Kinnesswood, and some opportunity to reduce surface water runoff to the east. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

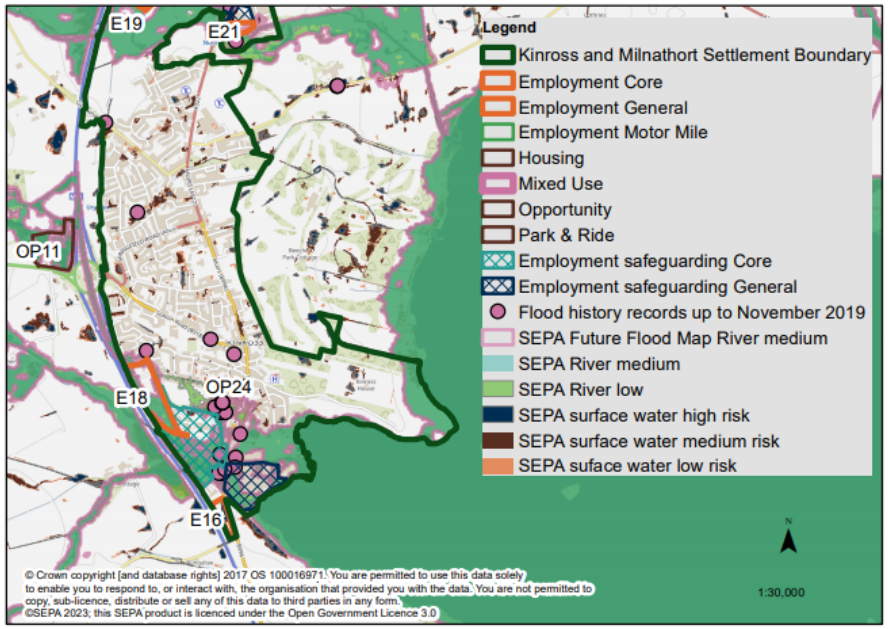
Kinross

6.251 Kinross lies within the Kinross, Milnathort and Glenrothes PVA, and Kinross is one of the target areas within this. The main sources of flooding in Kinross are surface water and river flooding from the South Queich, Gelly Burn and Clash Burn. A flood study prepared in this area in support of the proposed flood scheme indicates that 129 homes and 55 businesses are currently at risk of flooding.

6.252 There is a long record of flooding in this target area. Flooding occurred in January 1993, January 1999, December 2006, January and August 2008 and November 2009. In February 2020 several homes and roads suffered river flooding. Flooding was also recorded on 12 August 2020 when homes flooded because of unprecedented rainfall in the area. You can see the flood risk events up to November 2019 in figure 127, and the areas impacted by SEPA flood risk. This includes the LDP2 E18 allocation. The Proposed Plan will need to refer to mapping associated to the South Kinross flood protection scheme. It is likely that the LDP2 E18 area from the SUDS pond south should be marked as open space (if it lies within the at risk area and is not suitable for development) within LDP3. OP11 also lies within SEPA flood risk extents which will be considered further at Proposed Plan stage for LDP3.

6.253 In terms of Natural Flood Management opportunities there are some opportunities particularly sediment management opportunities related to the South Queich and the North Queich. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Figure 127 Kinross Flood risk



Milnathort

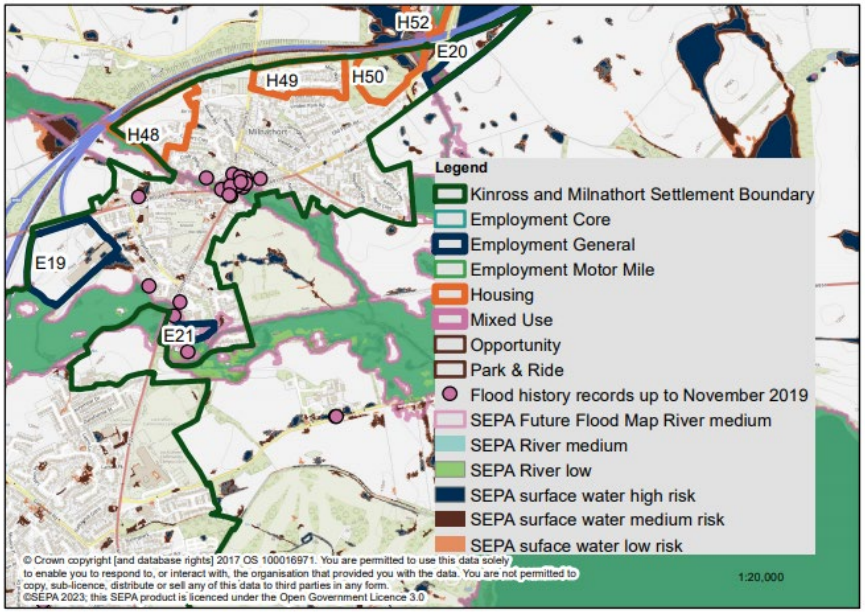
6.254 Milnathort lies within the Kinross, Milnathort and Glenrothes PVA, and Milnathort is one of the target areas within this. The main source of flooding in Milnathort is river flooding, however there is also a risk of surface water flooding. There are approximately 200 people and 130 properties currently at risk from flooding.

6.255 There is a long record of flooding in this area. The Back Burn flooded in January 1993, affecting properties in the town centre. In December 2006 a prolonged period of heavy rainfall caused flooding to house and a local pub, necessitating residents to be evacuated from their homes. A significant flood was recorded in July 2013 when surface water flooded several homes and businesses. Since then, smaller scale surface water flooding occurred in 2020 but this did not cause any damage to properties.

6.256 Figure 128 SEPA flood extents impact on Milnathort and includes an impact on the LDP2 allocations. Within the SEPA indicative river future flood mapping, the majority of LDP2 E21, a small marginal area to north of LDP2 H50, and a small marginal area to south of LDP2 H48 (which gained detailed planning permission in 2021 and is under construction) are affected. Also, SEPA surface water flood risk affects LDP2 H50 on its northern margins.

6.257 In terms of Natural Flood Management opportunities there are some opportunities particularly sediment management and floodplain storage opportunities related to the North Queich. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

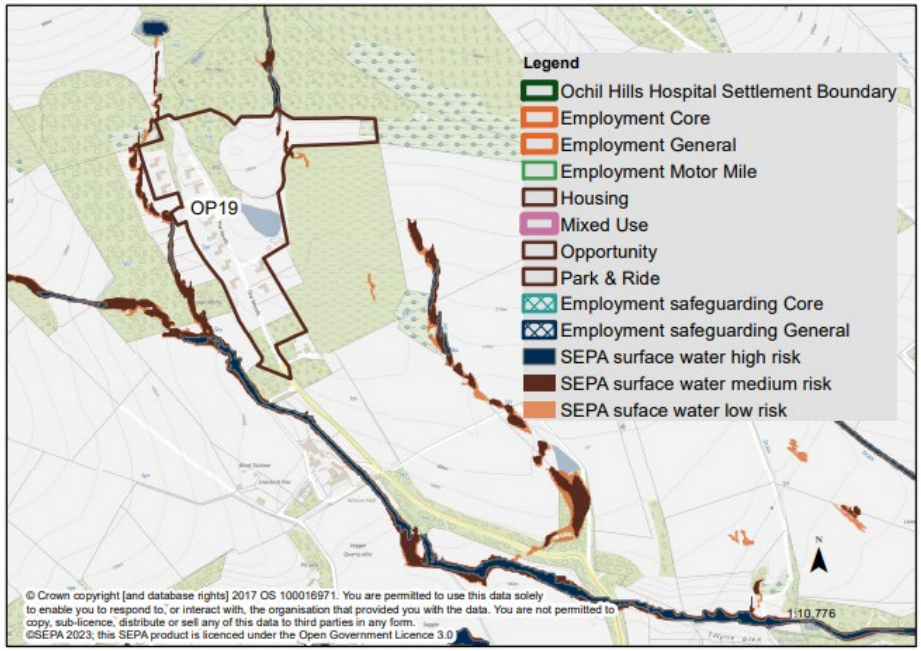
Figure 128 Milnathort Flood risk



Ochil Hills Hospital

6.258 Ochil Hills Hospital lies within the Kinross, Milnathort and Glenrothes PVA but it is not a target area within the PVA, and there are no recorded flood risk events. Ochil Hills Hospital and the LDP2 OP19 allocation is not significantly affected by SEPA flood risk mapping either, (figure 129).

Figure 129 Ochil Hills Hospital Flood risk

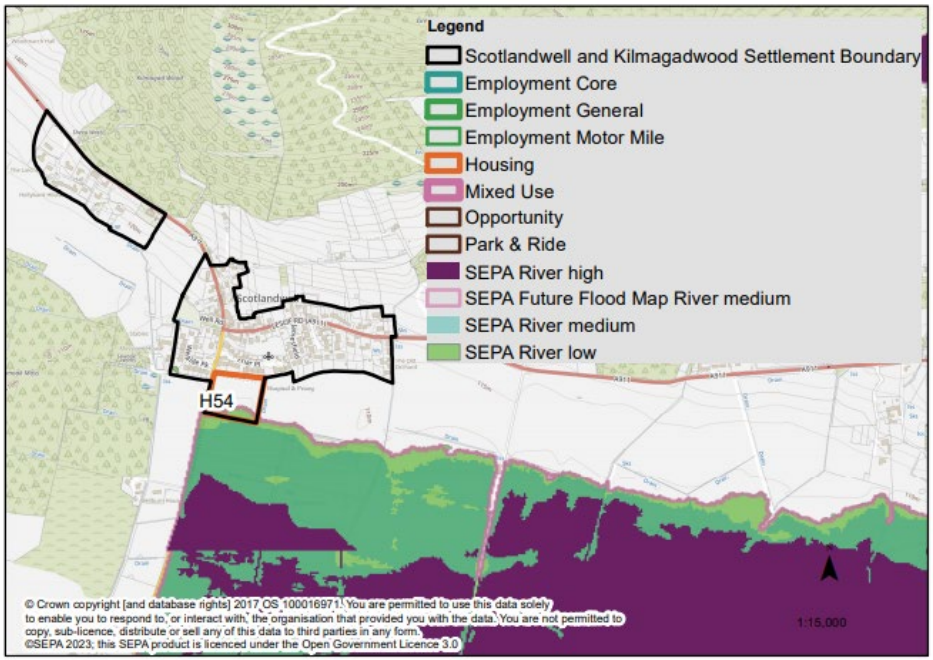


6.259 In terms of Natural Flood Management opportunities, the main opportunities lie outwith the settlement and relate to reducing runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Scotlandwell and Kilmagadwood

6.260 Scotlandwell and Kilmagadwood lies within the Kinross, Milnathort and Glenrothes PVA but it is not a target area within the PVA and there are no recorded flood events. On figure 130 the LDP2 H54 allocation is affected by the SEPA flood extents. There is a planning application currently under consideration for 22 homes on the LDP2 H54 allocation. An FRA has been carried out, but there is a SEPA holding objection due to there being insufficient information for their assessment.

Figure 130 Scotlandwell and Kilmagadwood Flood risk

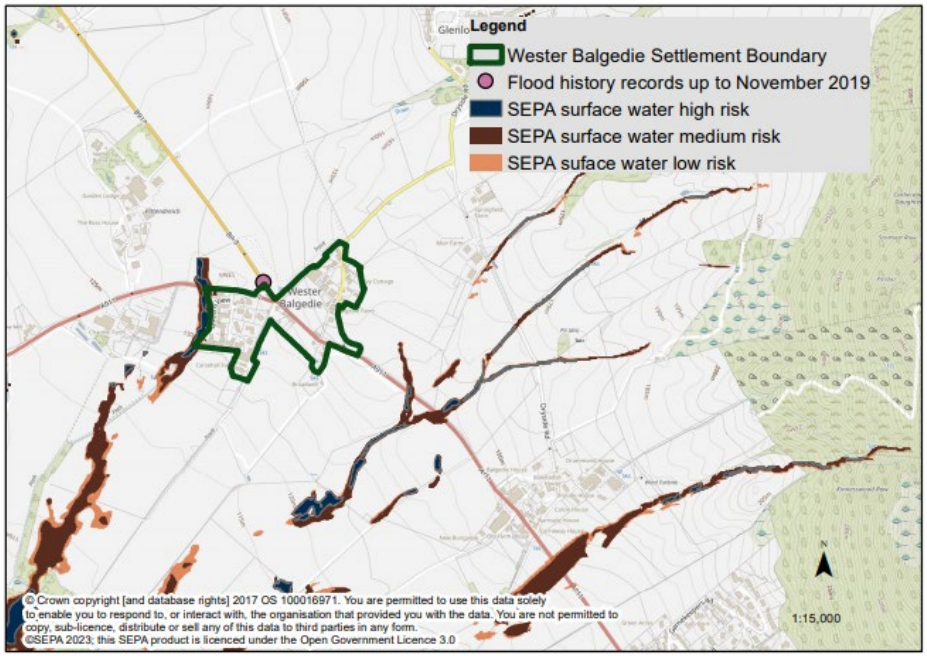


6.261 In terms of Natural Flood Management opportunities there are excellent opportunities around the settlements for reducing runoff, and for floodplain storage and related to surface water flood risk areas to the south of Scotlandwell. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

Wester Balgedie

6.262 Wester Balgedie lies within the Kinross, Milnathort and Glenrothes PVA but it is not a target area within the PVA. There was a street level flood event record from 30th November 1999 for a pluvial event which flooded the B919 at Balgedie Toll. On figure 131 the western edge is affected by SEPA surface water flood risk at its margins.

Figure 131 Wester Balgedie Flood risk



6.263 In terms of natural flood management opportunities theses are outwith the settlement in relation to some surface water flood risk areas, and to reduce runoff. Unfortunately, we cannot publish this mapped information due to licensing restrictions. However, you can view the natural flood management maps on the SEPA map viewer.

5 Selected flood event table

Table 1: Selected historical flooding events in Perth and Kinross local authority area

Catchment	Settlement	Event details
Tummel	Pitlochry	A water level and flow monitoring station is operated by SEPA on the River Tummel in Pitlochry. Parts of Pitlochry were flooded from the River Tummel in January 1993. The Greenfield site on the left bank upstream of Aldour Bridge was flooded and the wastewater treatment works on the opposite side of Bridge Road was flooded. In addition, there flooding problems in Duke of Edinburgh Drive and Fonab Crescent were reported. On 30 July 2002 there was a thunderstorm in the Pitlochry area that caused significant damage in and around Pitlochry. Roads and pavements were damaged and rail services halted due to breached embankments. West Moulin Road and Atholl Road were affected. The local Coop was flooded, and it was reported in the local newspaper that food items were washed as far down as the War Memorial Gardens. The Dunfermline Building Society basement was also reportedly flooded. On 6 August 2002 there was a further heavy rainfall event which again caused flooding in Moulin. The worst affected areas were Edradour Distillery, East Haugh, Dunfallandy and Balnaguard. The Black Spout Bridge was washed out which carries the main road into Pitlochry from the south was washed out and a section of a railway embankment collapsed. There were several landslips reported in the area with one house at East Haugh being inundated with mud and stones. The area was also exposed to significant weather events including Storms Desmond and Frank in December 2015 and January 2016, which resulted in flooding in the Tay and Tummel catchments. In July 2016, the Moulin Burn flooded affecting shops, houses and roads. Flooding in August 2020 affected several properties on Atholl Road. Most recently flooding in October 7/8, 2023, out of Moulin Burn flooded Co-op store on West Moulin Road. On 07 / 08 October 2023, Flooding occurred due to a breached flood wall to the north of Riverside; three properties were internally flooded. The river overtopped to the west, flooding the outbuildings of The White Lodge. Other property outbuildings were also flooded. Dalshian Farmhouse fields and General Wade's Military Road flooded due to the overtopping of local water courses.

Tay	Aberfeldy	The caravan park and golf course in Aberfeldy are frequently flooded from the River Tay. The road across the floodplain linking Aberfeldy with Weem also regularly floods. Properties in the northern end of Tayside Place were affected by flooding from the River Tay in January 1993. These properties also lie close to the Moness Burn. The wastewater treatment works were also flooded. Larger flood occurred on the River Tay on 13 December 2006. It is reported that there was a failure of an embankment on left bank, the caravan park flooded, and Tayside Crescent and the lower edges of the industrial estate by the sewerage works were also affected. SEPA holds aerial photographs of the Tay valley during the December 2006 flood. On 07 August 2023, at Camserney, three properties were internally flooded due to road drainage capacity being overwhelmed. On 10th – 11th August 2004 there was flooding reported from a small watercourse in the Braeside Park area of housing. Other significant floods have occurred in January 2005, in December 2015, and in January 2020 when the Aberfeldy to Weem road was closed due to flooding caused by Storm Dennis and surface water runoff from fields caused flooding to 2 properties. In December 2015, severe flooding occurred due to persistent torrential rain which fell over already-saturated ground. Access to the town became largely restricted and low-lying properties were subject to inundation. Further surface water flooding occurred in February 2021, however there is no record of properties being affected internally. In October 7/8, 2023, 15 caravans at Aberfeldy caravan park were abandoned. The Moness Burn is also a potential source of flooding. There are reports of significant flooding on 24th June 1935 on this watercourse. The floodwaters washed away a thirty metre stretch of bank about as wide as a road. After the flood about 100 metres of bank had to be built up and faced of with concrete. The other bank was also undermined and required repair. A wooden bridge was washed away and the channel was blocked at a girder bridge by trees that had been brought down by floodwaters. At this point floodwaters were diverted and flooded several homes. Other nearby streams were also in flood, altering their channel beds, banks and bringing down trees and rocks but there was little other damage. This was presumably because the areas around them had not been developed at that time.
Tay	Bankfoot	There is a long history of flooding in this area, including notable flooding in January 1993, August 2004, July 2015 and February and October 2020. In February 2020 during Storm Dennis, the Garry Burn burst its banks, inundating a number of roads. Some surface water flooding occurred in October 2020. Further minor flooding occurred on the

		Garry Burn in February 2021. Flooding occurred in June 2022, when surface water runoff from fields affected the B867 and the gardens of adjacent properties. On 07 / 08 October 2023, 4 internal properties were flooded from overtopping of Garry burn.
Tay	Dunkeld	During the January 1993 flood there was some flooding at Atholl Gardens. The floodwaters affecting this development were from the small watercourse that flows between the development and Atholl Street. There was also reported basement flooding in Tay Terrace to a house, the Atholl Arms Hotel and Taybank Hotel. SEPA and Perth and Kinross Council hold aerial photographs of the flooding in this area in December 2006. Further localised flooding occurred on the Spoutwells Burn, at Burnmouth Road and at Inver in August 2004. In December 2015 and January 2016, Storms Desmond and Frank caused prolonged rainfall throughout Perth and Kinross and properties and roads were affected in the Dunkeld area. The most recent flooding occurred in February 2020, with properties on Atholl Gardens being threatened by flooding from the Sawmill Burn.
Tay	Birnam	In January 1993 there was flooding of properties in Burnmouth Road which is located immediately upstream of the confluence of the Inchewan Burn and River Tay. There have been several other flood events that have affected properties in this area.
Tay	Spittalfield	There is a record of periodic flooding in this area. The first flood recorded in the area occurred in January 1993 when heavy rain and snow melt inundated roads around the Green. Further flooding occurred in 2006 with property flooding and the A894 being affected. The most recent flood was recorded in December 2015 due to Storm Desmond when roads and properties were affected. In January 2018 surface water flooding was reported in Spittalfield however there is no record of properties being affected by flooding.
Tay	Luncarty	There are limited records of flooding in this area. Flooding occurred in January 1993 and further minor floods have been noted in February 2002, January 2005, July and November 2009 and in July 2015 in the Westfield area when surface water flooding affected roads. The most recent flood was recorded on 5 December 2015 from Storm Desmond which caused some flooding of gardens in the area.
Earn	Comrie	There is a long record of flooding in this area. In August 2012, approximately 60 properties in Dalginross were flooded by the Water of Ruchill. In November 2012 the Water of Ruchill flooded again, inundating approximately 150 homes. In January 2016 the fire service was called to attend a localised flooding issue. The most recent flood occurred in February 2021 however no properties were affected.

Earn	Bridge of Earn	There is a long record of flooding in this area. The town was affected by flooding in February 1990 and January 1993. In December 2015, Storm Desmond caused prolonged rainfall across Perth & Kinross, affecting several properties in Bridge of Earn. In June 2016 intense rainfall caused flooding to homes, roads, and a local school. The Bridge of Earn Flood Prevention Scheme 2002 was created to safeguard the village of Bridge of Earn from flooding caused by the River Earn, the Deich Burn, and the Yellow Burn. The scheme aimed to provide protection equivalent to the 1993 flood, estimated to be a 50-year flood (2% annual exceedance probability). In August 2020, heavy rain flooded one property and some roads. Flooding occurred in September 2022 when surface water flooding affected four properties. Also, on October 8th, 2023, 5 internal properties were flooded.
Ericht	Blairgowrie	The main source of flooding in Blairgowrie is surface water. SEPA operates a water level and flow monitoring station at Craighall, immediately upstream of Blairgowrie. The largest flood recorded here occurred in January 1993. The sewer pipe across the River Ericht was washed away and had to be replaced but there was no reports of private properties being affected during this event. In 1993 flood waters were reported to have reached close to the West Mill farm buildings. Anecdotal evidence provided by residents has identified that the field to the north of west mill farm has previously flooded (twice in forty years). A booklet was produced by D Moodie from Blair Library in 1976 entitled “Old Blairgowrie – Tours, History, Memories and Tales” which includes details of some historic flooding. A letter from a local woman who lived in Eastmill Farm describes the events of the 1919 flood event which caused a huge amount of devastation in the Ericht Valley. It is explained that although her house was not flooded during this event, flood water lapped up against the front door. In July 2004 a road and 2 properties were affected by surface water flooding. In July, October and December 2015 heavy rainfall led to flooding of a number of properties as well as road flooding. Flooding was recorded on 12 August 2020 when local roads and 5 properties flooded as a result of heavy rainfall in the area. In October 2021 flooding on the Rattray Burn affected 1 property in Rattray. Further flooding occurred on the Rattray Burn in November 2022.

		On 7/8 October 2023 the Rattray Burn overtopped and flowed down Parkhill Road/Back Row/Springbank Road and onto High Street etc but no internal properties were affected.
Isla	Alyth	Parts of Alyth were flooded in January 1993. The Ove Arup "River Tay Catchment Study (September 1994) states that the Alyth Burn probably overflowed along Commercial Street and Springbank Road. It states that the only significant flooding was believed to be in Springbank Road itself however an earlier study by Babtie Shaw & Morton "Flooding In The Tay Catchment – January 1993" (April 1993) noted that there was also houses in James Street affected. The Ove Arup report states that several houses were evacuated during the event. There was also flooding reported in part of the Cambridge Street development. It is thought that floodwater may have flowed overland from the Doctor's Burn to reach the development. There was a flash flood on the Alyth Burn on 1st September 1998. Timber from a local timber yard was washed into the watercourse during this event and got caught up at the bridges that cross the watercourse in the town. This exacerbated flood levels and resulted in flooding at Alyth Hotel on Commercial Street. Springbank Road and Alyth Square were also affected by floodwaters. There are recent records of frequent flooding in this area. A significant flood was recorded in July 2015 when the Alyth Burn burst its banks, affecting many homes and businesses. A notable flood occurred in August 2020, when the Alyth Burn and other small watercourses overtopped resulting in flooding of properties. Further flooding occurred in October 2020 and October 2021 but no properties in the area were flooded. Further flooding in October 2023 internally flooded a property.
Isla	Coupar Angus	During the 1993 flood event there was no damage to property reported but there was minor flooding to the waste water treatment works. There is a long history of flooding in this area from the Coupar Burn including flooding in August 2004 and December 2012, when several homes and businesses flooded from Coupar Burn. In December 2015, Storm Frank caused prolonged rainfall across Perth & Kinross. Several roads were affected in the Coupar Angus area. Flooding on the Coupar Burn occurred in February 2021 and November 2022 but there is no record of properties being affected. Flooding on 07 / 08 Oct 2023 flooded 2 internal properties, and on 19/20 Oct, 5 properties were flooded.
Tay	Scone	There has been a history of flooding in this area. In August 2004 high intensity rainfall resulted in flooding to a number of properties and the Annaty Burn overtopped. A series of small-scale localised floods in Scone were recorded in 2010, 2013 and 2014. In May 2017, heavy rainfall led to several roads in the area being flooded. Heavy

		rain on 11 and 12 August 2020 led to surface water flood water outside some properties to rise to the level of airbricks. A flood was recorded February 2021 when multiple areas across Perth and Kinross were affected, including Scone. Also, on 07/08 Oct 2023 Annaty Burn came out of bank and onto street, but no properties were affected. Most recently there was flooding on 29th May 2024, more details will be provided before this SFRA is finalised.
Tay	Perth	There was significant flooding in Perth in February 1990 and January 1993. The Perth Flood Prevention Scheme was constructed after the 1993 event to protect properties from a repeat of this flooding which is caused an estimated £20 million of damage. The scheme will protect Perth from direct inundation from the River Tay up to a 0.5% (1:200) flood from a fluvial, tidal and combined event. The highest risk of river flooding is from the Town's Lade and Craigie Burn to Perth. The Newton Burn and numerous surface water discharge to the Perth Lade and there is a risk of flooding to some low-lying areas adjacent to it. On the 21 July 2010 there was extensive surface water flooding to Fairfield Avenue and McCallum Court and a children's nursery was inundated by around one metre depth of floodwater. Also, on 16 July 2011 heavy rain caused surface water flooding in Perth and homes and businesses were affected. In June 2017 drains overflowed as a result of heavy rainfall, flooding properties and several gardens and roads. Recently, on 11 / 12 August 2020 heavy rainfall caused widespread flooding in Perth flooding approximately 155 homes and businesses across the city. In January 2016, on the only occasion when water levels in the River Tay have been high enough to bring the reservoir into operation, flooding was experienced in the Bute Drive area. Subsequent investigations concluded that this flooding was due to seepage under the southern embankment. A project was later completed to install a seepage cut-off wall (sheet piles) to prevent a reoccurrence of this issue. In September 2022 flooding occurred with approximately 40 properties were flooded in Perth. A major flood event impacted upon Perth during October 2023 with approximately 63 homes and caravans, and Bells sport centre, all experiencing internal flooding of property. Whilst most recently December 2023, 2 internal properties were flooded. The Craigie Burn has a history of flooding with events occurring on 26 September 1981, January 1993, 6 August 2002, and 21 July 2010. These floods were caused by different weather types. The 1981 event was caused by rainfall over a 12-hour period which, according to the local newspaper resulted in waist high floodwater in nearby Low Road. The January 1993 flood was the result of a combination of heavy rain and snow melt with the Craigie Burn breaking its banks and flooding streets in the Craigie area of Perth, including the South Inch. The August 2002 event resulted from a thunderstorm with around 30 mm of rain falling over a one-hour period. The most recent flood

		event on the Craigie Burn that caused property flooding was 08 September 2022. The Craigie Burn catchment was badly affected with approximately 25 properties being flooded and some impact to a larger number of resident's gardens and outbuildings. Flood attenuation ponds have been constructed in the upper part of the Craigie Burn catchment and form part of the Perth Flood Prevention Scheme. These ponds were operating during the 2002 and 2010 events but were unable to prevent the flooding of several streets along the course of the Craigie Burn. Flood events during 07/08 Oct 2023 included impacts on Cragie and scouring burn catchments in Perth. The recent flood study recommends the following two actions: a) upgrade and increase the capacity of the existing culvert on the Craigie Burn at Queen's Avenue (at the access to Queen's Court), b) localised channel modifications on the Craigie Burn (adjacent to Balmoral Place and Queen's Avenue) upstream and downstream of the upgraded culvert. The funding for the Craigie proposed scheme has been provided in budget approved by Full Committee. This will now be progressed out with the typical FRM delivery cycle approach.
Tay	Methven	There are records of flooding in this area. Flooding occurred in January and July 2002, July 2005, July 2010 and November 2012. In August 2020 when heavy rain led to flooding of approximately 4 properties and roads. Flooding occurred in September 2022 when two properties are understood to have flooded. The most recent flooding occurred in 7/8 October 2023 when 3 internal properties were flooded.
Tay	Almondbank	There is a long record of flooding in this area. Previous significant flooding occurred in January 1993, September and December 1999 and January 2011. The most recent flood was recorded in December 2015 due to Storm Desmond when the River Almond overflowed causing erosion to the riverbank. The Almondbank Flood Protection Scheme was substantially completed in 2018 and protects homes and businesses from flooding in the area. In August 2020, some minor surface water flooding was recorded at the Lochty Industrial Estate. In September 2022, heavy rainfall resulted in the River Almond flooding onto the adjacent football pitch, affecting the road access to the bowling club. No properties were affected.
Forth	Blackford	There are records of flooding in this area. On 13 December 2006 properties in Abercairney Place, Blackford and surrounding areas were flooded. Recent notable floods include August 2019 and February 2020. In February 2020, 2 homes and 1 business flooded following Storm Dennis.

Forth Estuary	Kinross	There is a long record of flooding in this target area. Flooding occurred in January 1993, January 1999, December 2006, January and August 2008 and November 2009. In February 2020 several homes and roads suffered river flooding. Most recently, flooding was recorded on 12 August 2020 when homes flooded because of unprecedented rainfall in the area.
Forth Estuary	Milnathort	There is a long record of flooding in this area. The Back Burn flooded in January 1993, affecting properties in the town centre. In December 2006 a prolonged period of heavy rainfall caused flooding to house and a local pub, necessitating residents to be evacuated from their homes. The most recent significant flood was recorded in July 2013 when surface water flooded several homes and businesses. Since then, smaller scale surface water flooding occurred in 2020 but this did not cause any damage to properties.
Invergowrie Burn	Invergowrie	The PVA has been exposed to recent significant weather events including Storms Desmond and Frank in December 2015 and January 2016, which resulted in flooding in the Tay Estuary and Montrose Basin catchments. Invergowrie Burn burst its bank on morning of 20 October 2023 with flooding on Station Road, Boniface Road and Alistair Soutar Crescent, and 6 internal properties flooded.