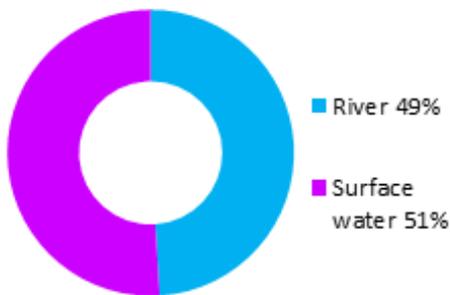


Niddrie Burn / Burdiehouse Burn catchment (Potentially Vulnerable Area 10/20)

| Local Plan District | Local authority | Main catchment |
|---------------------|---|--|
| Forth Estuary | The City of Edinburgh Council, East Lothian Council, Midlothian Council | Niddrie and Burdiehouse Burn catchment |

Summary of flooding impacts



At risk of flooding

- 390 residential properties
- 40 non-residential properties
- £780,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

| <i>Flood protection scheme/works</i> | <i>Natural flood management works</i> | <i>New flood warning</i> | <i>Community flood action groups</i> | <i>Property level protection scheme</i> | <i>Site protection plans</i> |
|--------------------------------------|---------------------------------------|--------------------------|--------------------------------------|---|------------------------------|
| Flood protection study | Natural flood management study | Maintain flood warning | Awareness raising | Surface water plan/study | Emergency plans/response |
| Maintain flood protection scheme | Strategic mapping and modelling | Flood forecasting | Self help | Maintenance | Planning policies |

Actions

Niddrie and Burdiehouse Burn Catchment (Potentially Vulnerable Area 10/20)

| Local Plan District | Local authority | Main catchment |
|---------------------|---|--|
| Forth Estuary | The City of Edinburgh Council, East Lothian Council, Midlothian Council | Niddrie and Burdiehouse Burn catchment |

Background

This Potentially Vulnerable Area is 26km² and includes the whole of the Niddrie and Burdiehouse Burn catchment (shown below). It covers the south and east areas of Edinburgh including Brunstane, Niddrie, Burdiehouse and Fairmilehead.



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The main watercourse is the Burdiehouse Burn which changes name to the Niddrie Burn and Brunstane Burn in the lower reaches where it flows into the Firth of Forth.

There are approximately 390 residential properties and 40 non-residential properties at risk of flooding. The Annual Average Damages are approximately £780,000.

The area has a risk of surface water and river flooding.

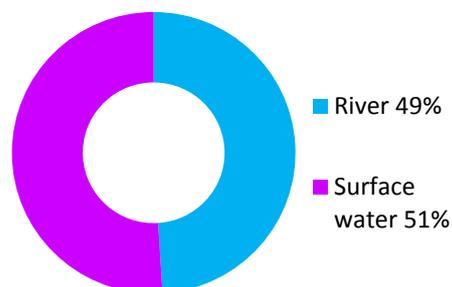


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The greatest risk of river flooding is in the Eastfield, Niddrie, Moredun and Burdiehouse areas from the Niddrie and Burdiehouse Burn. The greatest risk of surface water flooding is in the Fairmilehead, Burdiehouse and Niddrie areas.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, protected sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

In this Potentially Vulnerable Area there is lower confidence in the SEPA flood maps. SEPA and The City of Edinburgh Council are working together to improve the understanding of flooding issues in this area.

| | 1 in 10 High likelihood | 1 in 200 Medium likelihood | 1 in 1000 Low likelihood |
|---|---|---|---|
| Residential properties (total 18,000) | 100 | 390 | 550 |
| Non-residential properties (total 640) | <10 | 40 | 60 |
| People | 210 | 860 | 1,200 |
| Community facilities | <10 Educational buildings | <10 Educational buildings | <10 Educational buildings |
| Utilities | <10 | 10 | 10 |
| Transport links (excluding minor roads) | 10 A roads, 2 B roads at 75 locations 1 Railway route at 1 location: Berwick-upon-Tweed to Edinburgh | 10 A roads, 2 B roads at 124 locations 1 Railway route at 2 locations: Berwick-upon-Tweed to Edinburgh | 10 A roads, 2 B roads at 137 locations 1 Railway route at 3 locations: Berwick-upon-Tweed to Edinburgh |
| Environmental designated areas (km ²) | 0.1 | 0.1 | 0.1 |
| Designated cultural heritage sites | 2 | 4 | 5 |
| Agricultural land (km ²) | 0.6 | 0.8 | 0.8 |

Table 1: Summary of flooding impacts

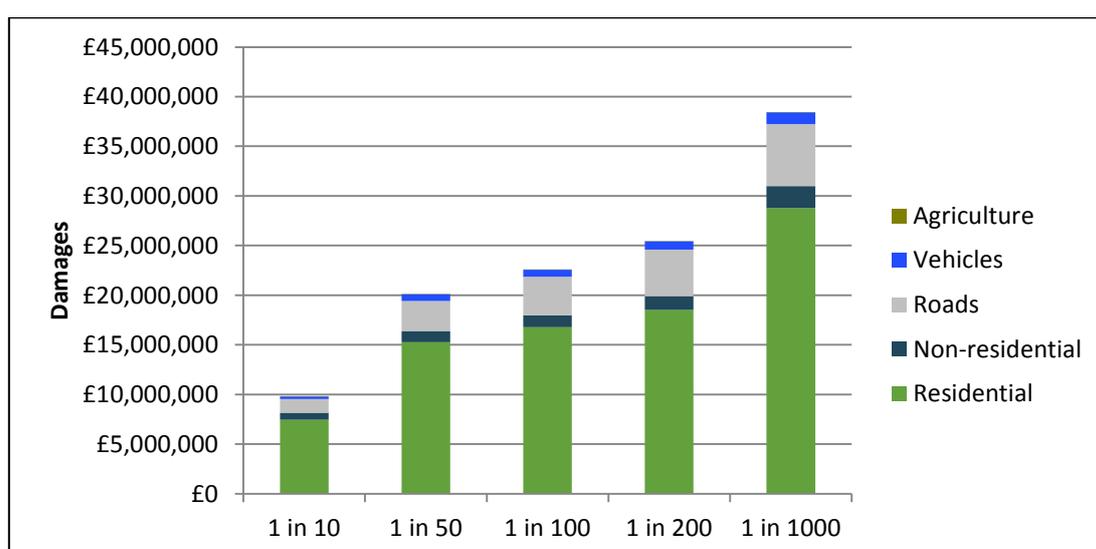


Figure 2: Damages by flood likelihood

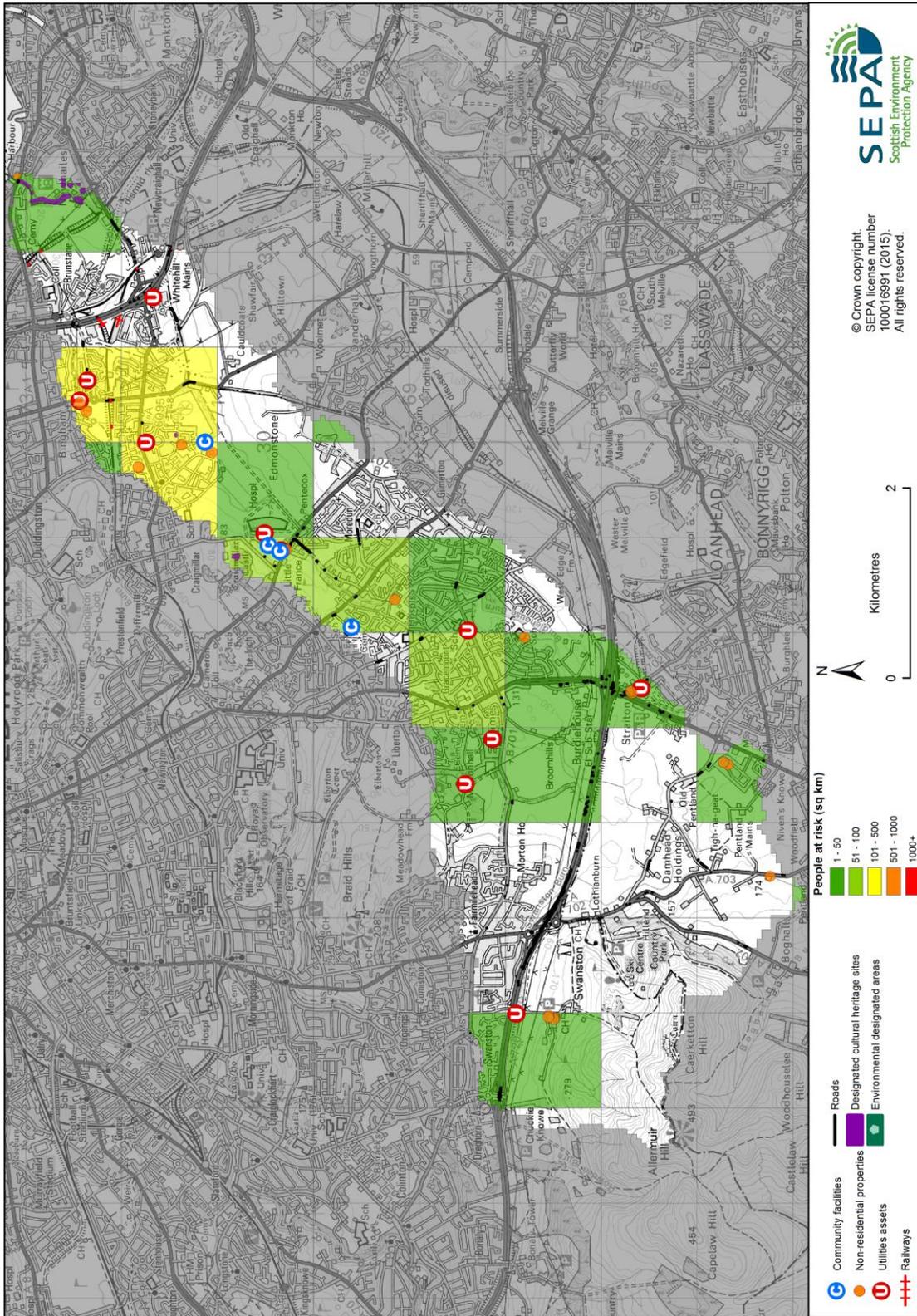


Figure 3: Impacts of flooding

History of flooding

No significant floods have been recorded in this Potentially Vulnerable Area.

Objectives to manage flooding in Potentially Vulnerable Area 10/20

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for the Niddrie Burn / Burdiehouse Burn catchment Potentially Vulnerable Area.

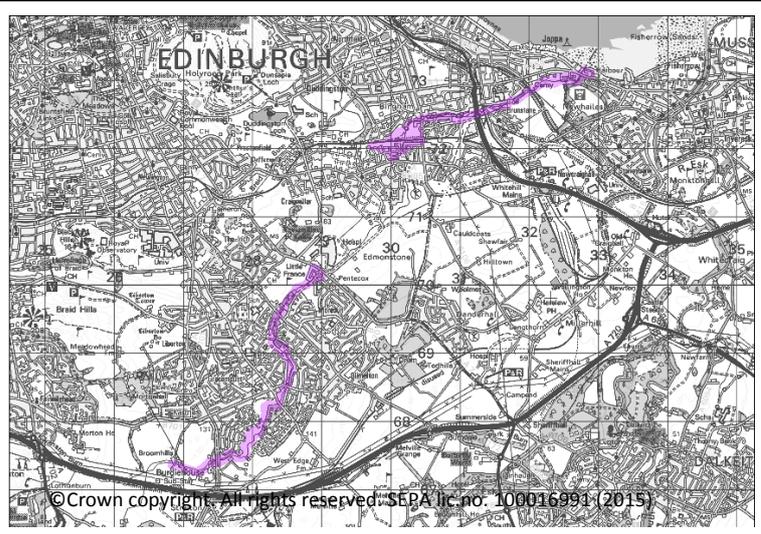
Reduce economic damages to residential and non-residential properties and risk to people in Edinburgh / Burdiehouse caused by flooding from the Niddrie Burn

Indicators:

- 7,600 people
- £1.1 million Annual Average Damages from residential properties
- £72,000 Annual Average Damages from non-residential properties

Objective ID: 10071, 10072

Target area:



| Target area | Objective | ID | Indicators within PVA |
|---|---|-------|---|
| Edinburgh, Musselburgh, Penicuik, Lasswade, Loanhead, Newtongrange and Dalkeith | Reduce economic damages and number of residential properties at risk of surface water flooding in Edinburgh, Musselburgh, Penicuik, Lasswade, Loanhead, Newtongrange and Dalkeith where practical | 10052 | * See note below |
| Applies across Forth Estuary Local Plan District | Avoid an overall increase in flood risk | 10001 | <ul style="list-style-type: none"> • 390 residential properties • £780,000 Annual Average Damages |
| Applies across Forth Estuary Local Plan District | Reduce overall flood risk | 10099 | <ul style="list-style-type: none"> • 390 residential properties • £780,000 Annual Average Damages |
| Applies across Forth Estuary Local Plan District | Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies. | | |

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 10/20 there are 200 residential properties at risk and Annual Average Damages of £390,000.

Actions to manage flooding in Potentially Vulnerable Area 10/20

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for the Niddrie Burn / Burdiehouse Burn catchment Potentially Vulnerable Area.

| Selected actions | | | | | |
|--------------------------------------|---------------------------------------|--------------------------|--------------------------------------|---|------------------------------|
| <i>Flood protection scheme/works</i> | <i>Natural flood management works</i> | <i>New flood warning</i> | <i>Community flood action groups</i> | <i>Property level protection scheme</i> | <i>Site protection plans</i> |
| Flood protection study | Natural flood management study | Maintain flood warning | Awareness raising | Surface water plan/study | Emergency plans/response |
| Maintain flood protection scheme | Strategic mapping and modelling | Flood forecasting | Self help | Maintenance | Planning policies |

| | | | |
|--------------------------|---|----------------------|-------------------------|
| Action (ID): | FLOOD PROTECTION STUDY (100710005) | | |
| Objective (ID): | Reduce economic damages to residential and non-residential properties and risk to people in Edinburgh / Burdiehouse caused by flooding from the Niddrie Burn (10071, 10072) | | |
| Delivery lead: | The City of Edinburgh Council | | |
| Priority: | National: | | Within local authority: |
| | 57 of 168 | | 1 of 3 |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | A flood protection study has been recommended for Niddrie Burn in Edinburgh to assess whether flood storage, modification of conveyance, installation / modification of fluvial control structures, flood defences and sediment management could reduce flood risk. The study should also consider the viability of property level protection. The study should take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream. This study should also aim to improve gauging on the Niddrie / Burdiehouse Burn catchment in partnership between SEPA and the City of Edinburgh Council. | | |
| Potential impacts | | | |
| Economic: | The study could benefit 178 residential properties and 19 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.8 million. | | |
| Social: | Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the study area. In addition there is one healthcare facility which has been identified as potentially | | |

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|-----------------------|--|
| Social: | benefitting from any proposed actions. |
| Environmental: | Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. The Burdiehouse Burn (water body ID 3600) is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status. Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. Gardens and designed landscapes, listed buildings, local nature reserves, Sites of Special Scientific Interest, Ramsar sites and ancient woodlands are also present in the study area and could be positively or negatively impacted. |

| | | | |
|------------------------|--|----------------------|------------------|
| Action (ID): | SURFACE WATER PLAN/STUDY (100520018) | | |
| Objective (ID): | Reduce economic damages and number of residential properties at risk of surface water flooding in Edinburgh, Musselburgh, Penicuik, Lasswade, Loanhead, Newtongrange and Dalkeith where practical (10052) | | |
| Delivery lead: | The City of Edinburgh Council, Midlothian Council, East Lothian Council | | |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. | | |

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|------------------------|---|----------------------|------------------|
| Action (ID): | SURFACE WATER PLAN/STUDY (100520019) | | |
| Objective (ID): | Reduce economic damages and number of residential properties at risk of surface water flooding in Edinburgh, Musselburgh, Penicuik, Lasswade, Loanhead, Newtongrange and Dalkeith where practical (10052) | | |
| Delivery lead: | Scottish Water in partnership with local authorities | | |
| Status: | Ongoing | Indicative delivery: | 2016-2021 |
| Description: | An integrated catchment study will be carried out to support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea. | | |

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|------------------------|--|----------------------|------------------|
| Action (ID): | STRATEGIC MAPPING AND MODELLING (100990019) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | Scottish Water | | |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk. | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | MAINTAIN FLOOD PROTECTION SCHEME (100710017) | | |
| Objective (ID): | Reduce economic damages to residential and non-residential properties and risk to people in Edinburgh / Burdiehouse caused by flooding from the Niddrie Burn (10071, 10072) | | |
| Delivery lead: | The City of Edinburgh Council | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | Continue to maintain the flood control structure and flood storage area at Greendykes and flood defences at Nether Craigour once completed. The works are due to be completed in 2016/17. | | |

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|------------------------|--|----------------------|----------------|
| Action (ID): | FLOOD FORECASTING (100990009) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | SEPA | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website. | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | SELF HELP (100990011) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | — | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | AWARENESS RAISING (100990013) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | Responsible authorities | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan. | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | MAINTENANCE (100990007) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | Local authorities, asset / land managers | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk. | | |

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|------------------------|--|----------------------|----------------|
| Action (ID): | EMERGENCY PLANS/RESPONSE (100990014) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | Category 1 and 2 Responders | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | <p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p> <p>The City of Edinburgh Council operates Emergency Action Packs to determine where people should be deployed during flood events. The City of Edinburgh Council owns temporary pallet barriers and sandbags that can be used to protect properties from river flooding.</p> | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | PLANNING POLICIES (100010001) | | |
| Objective (ID): | Avoid an overall increase in flood risk (10001) Reduce overall flood risk (10099) | | |
| Delivery lead: | Planning authority | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.</p> | | |