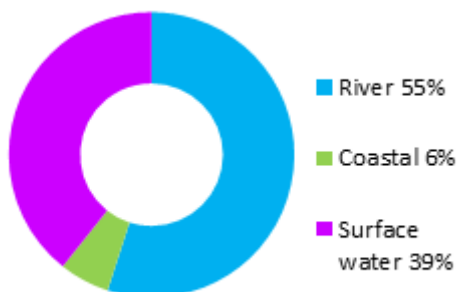


Kirkcaldy, East Wemyss and Methil (Potentially Vulnerable Area 10/05)

| Local Plan District | Local authority | Main catchment |
|---------------------|-----------------|--------------------|
| Forth Estuary | Fife Council | South Fife coastal |

Summary of flooding impacts



At risk of flooding

- 190 residential properties
- 180 non-residential properties
- £850,000 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.

| Flood protection scheme/works | <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 | <i>Natural flood management study</i> | 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 |

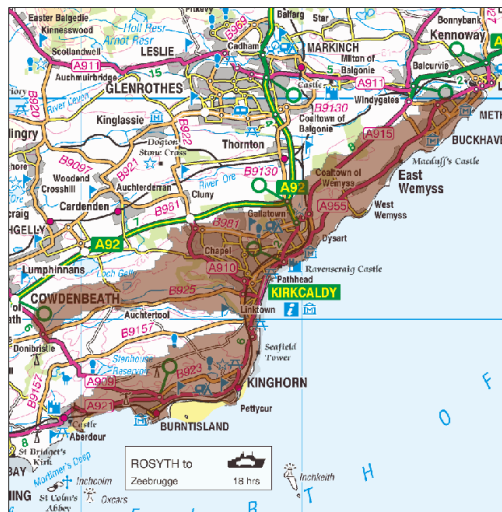
Actions

Kirkcaldy, East Wemyss and Methil (Potentially Vulnerable Area 10/05)

| Local Plan District | Local authority | Main catchment |
|---------------------|-----------------|--------------------|
| Forth Estuary | Fife Council | South Fife coastal |

Background

This Potentially Vulnerable Area is 71km² and part of the Firth of Forth catchment (shown below). This is a moderately sized, partially urbanised area containing the towns of Kirkcaldy, Burntisland and Methil. The main watercourses are the Tiel, East and Den Burns in Kirkcaldy and the Chemiss and Kingslaw Burns in East Wemyss.



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The area has a risk of river, surface water and coastal flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding with surface water also posing a significant risk.

There are approximately 190 residential properties and 180 non-residential properties at risk of flooding. The Annual Average Damages are approximately £850,000.

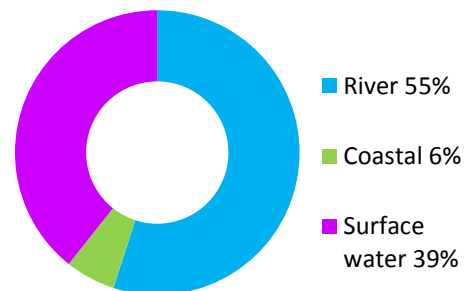


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of river flooding is from Tiel Burn to Kirkcaldy. The highest risk of surface water flooding is also in Kirkcaldy.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated 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 non-residential properties followed by damages to residential properties. A railway line is also notably impacted. 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.

The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works and pumping stations). Within this Potentially Vulnerable Area there are seven assets identified as being at risk of flooding.

| | 1 in 10 High likelihood | 1 in 200 Medium likelihood | 1 in 1000 Low likelihood |
|--|--|--|--|
| Residential properties (total 36,000) | 40 | 190 | 510 |
| Non-residential properties (total 3,900) | 80 | 180 | 260 |
| People | 90 | 410 | 1,100 |
| Community facilities | <10 Healthcare facilities | <10 Healthcare facilities | <10 Includes: educational buildings, emergency services and healthcare facilities |
| Utilities | <10 | 30 | 40 |
| Transport links (excluding minor roads) | 6 A roads, 9 B roads at 85 locations 1 Railway route at 12 locations: Fife Circle | 6 A roads, 10 B roads at 165 locations 1 Railway route at 33 locations: Fife Circle | 6 A roads, 10 B roads at 203 locations 1 Railway route at 40 locations: Fife Circle |
| Environmental designated areas (km²) | 0.5 | 0.5 | 0.5 |
| Designated cultural heritage sites | 7 | 8 | 9 |
| Agricultural land (km²) | 0.4 | 0.5 | 0.6 |

Table 1: Summary of flooding impacts

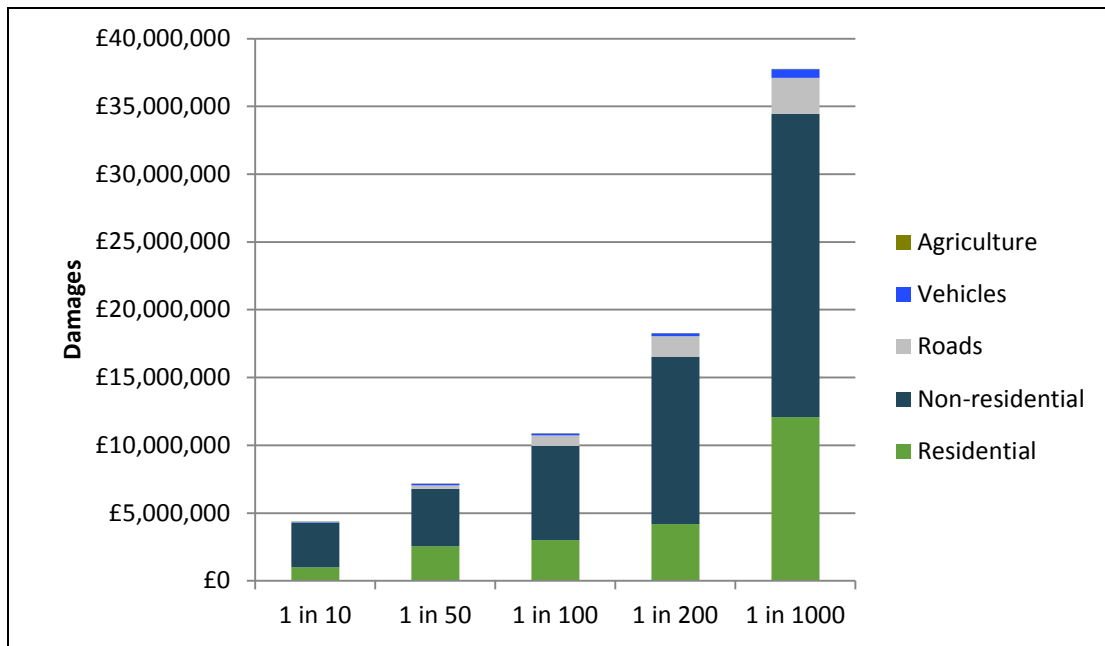


Figure 2: Damages by flood likelihood

History of flooding

The following significant coastal floods have been recorded in Kirkcaldy:

- 30 March 2010: Non-residential property affected after coastal flooding to Esplanade Road.
- 18 March 1969: Two boats sunk in the harbour and Kirkcaldy esplanade flooded under two feet of water. Transport services interrupted.
- 4 April 1958: Homes and businesses flooded, cars washed away and civil infrastructure damaged. Forty families were evacuated.
- 1 October 1947: Waves up to 30 feet affected Kirkcaldy with properties and cars damaged from flood waters.

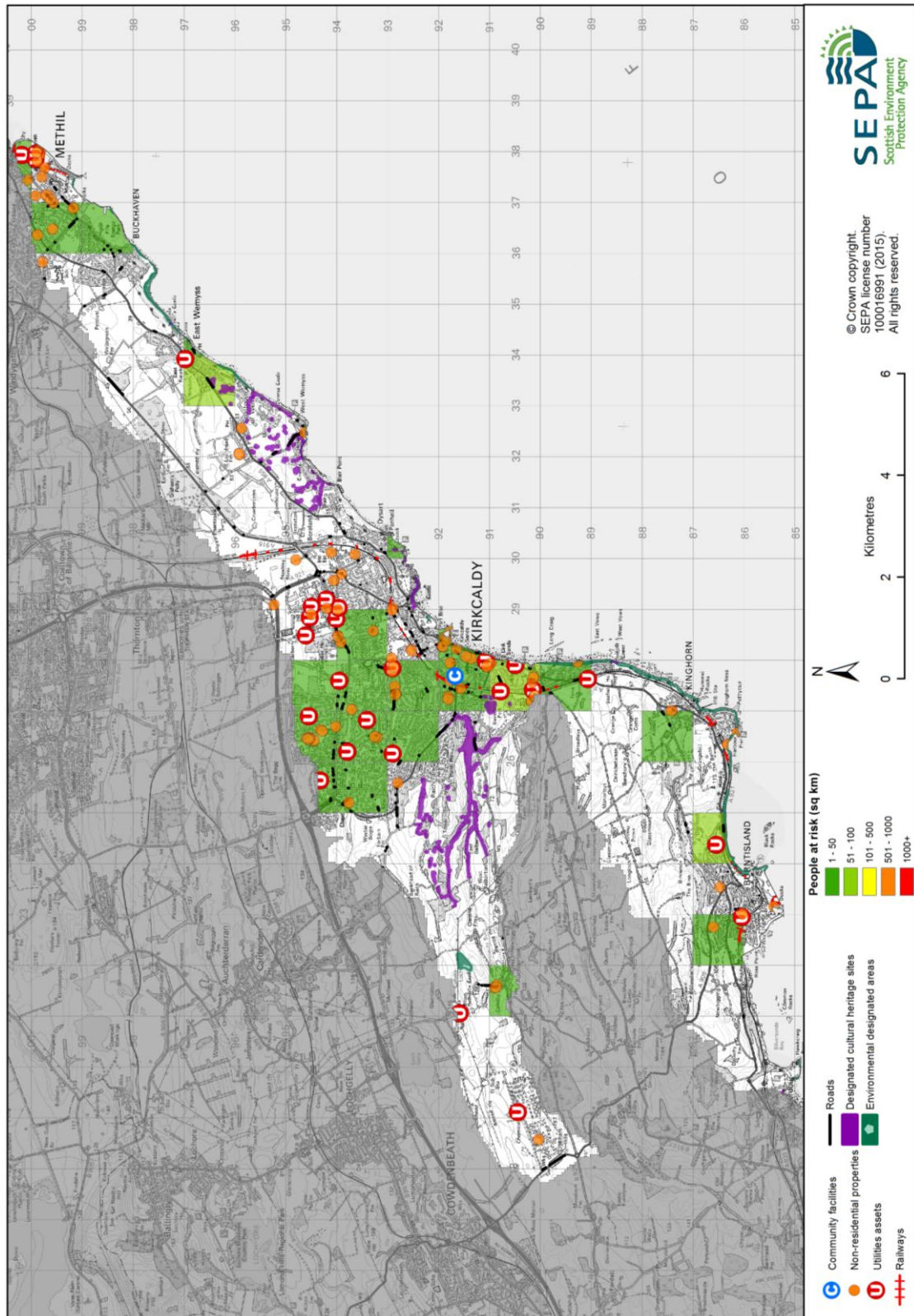


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 10/05

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 Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area.

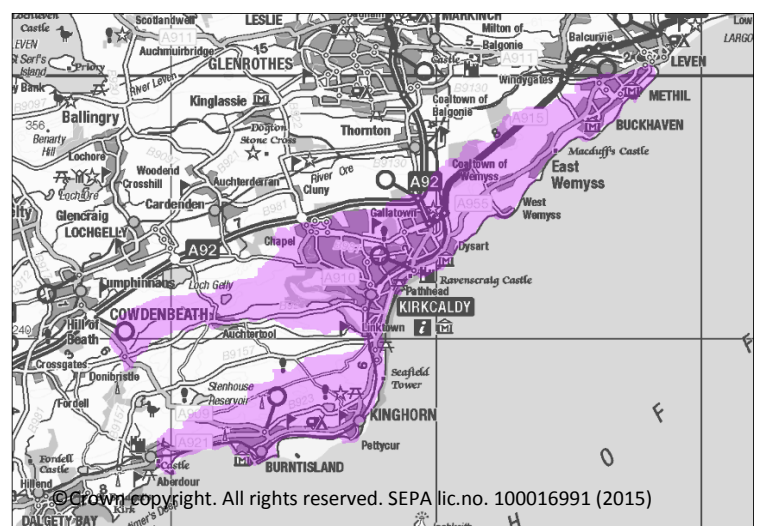
Reduce economic damages to residential and non-residential properties in the Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area caused by river and coastal flooding

Indicators:

- £130,000 Annual Average Damages from residential properties
- £330,000 Annual Average Damages from non-residential properties

Objective ID: 10015

Target area:



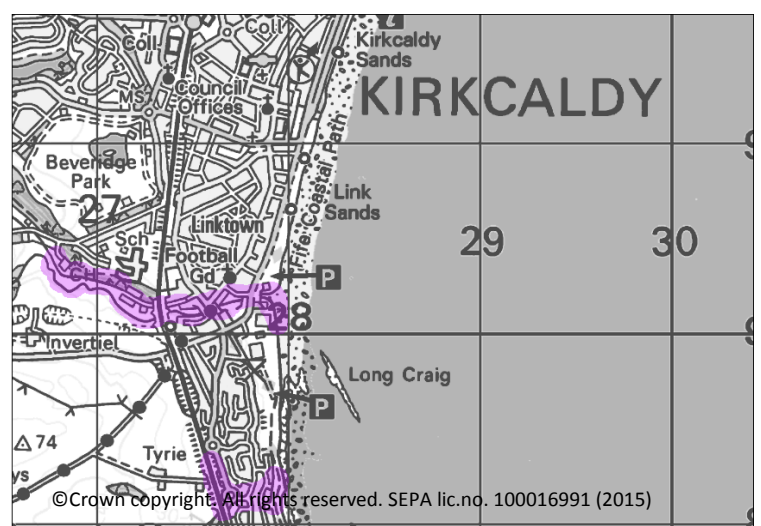
Reduce risk to people in Kirkcaldy from river flooding

Indicators:

- 110 people

Objective ID: 10016

Target area:



| Target area | Objective | ID | Indicators within PVA |
|--|---|-------|---|
| Burntisland | Reduce the physical or disruption risk related to the transport network for rail | 10300 | <ul style="list-style-type: none"> • 0.3km of rail track at six locations |
| Kirkcaldy and Cluny | Reduce economic damages and number of residential properties at risk of surface water flooding in Kirkcaldy and Cluny where practical | 10013 | * See note below |
| Applies across Forth Estuary Local Plan District | Avoid an overall increase in flood risk | 10001 | <ul style="list-style-type: none"> • 190 residential properties • £850,000 Annual Average Damages |
| Applies across Forth Estuary Local Plan District | Reduce overall flood risk | 10099 | <ul style="list-style-type: none"> • 190 residential properties • £850,000 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 10/05 there are 130 residential properties at risk and Annual Average Damages of £330,000.

Actions to manage flooding in Potentially Vulnerable Area 10/05

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 Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area.

| Selected actions | | | | | |
|----------------------------------|---------------------------------------|--------------------------|--------------------------------------|---|------------------------------|
| Flood protection scheme/works | <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 | <i>Natural flood management study</i> | 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 SCHEME/WORKS (10300021) | | |
| Objective (ID): | Reduce the physical or disruption risk related to the transport network for rail (10300) | | |
| Delivery lead: | Network Rail | | |
| Status: | Under development | Indicative delivery: | 2016-2021 |
| Description: | Network Rail will carry out civil engineering work which will reduce the risk of flooding on identified sections of the rail network within this Potentially Vulnerable Area. | | |

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|------------------------|---|---|------------------|
| Action (ID): | FLOOD PROTECTION STUDY (100150025) | | |
| Objective (ID): | Reduce risk to people in Kirkcaldy from river flooding (10016) Reduce economic damages to residential and non-residential properties in the Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area caused by river and coastal flooding (10015) | | |
| Delivery lead: | Fife Council | | |
| Priority: | National: 25 of 168 | Within local authority: 2 of 16 | |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | A flood protection study has been recommended for Linktown and Kirkcaldy to assess whether flood storage, sediment management, modification of conveyance, flood defences and natural flood management could reduce flood risk. The study should also investigate property relocation. Natural flood management options | | |

| | |
|--------------------------|---|
| | that should be considered include runoff control, river/ floodplain restoration, sediment management and wave attenuation. The study should take a sustainable approach and consider the interaction between actions upstream and downstream and potential effects on coastal processes along the shoreline. |
| Potential impacts | |
| Economic: | The study could benefit 42 residential properties and 50 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £13 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 flood protection study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. |
| 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. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Firth of Forth Special Protection Area. Scheduled monuments, gardens and designed landscapes, listed buildings, Sites of Special Scientific Interest, Ramsar sites and ancient woodlands are also present in the study area and could be positively or negatively impacted. |

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|--------------------------|---|----------------------|-------------------------|
| Action (ID): | FLOOD PROTECTION STUDY (100150005) | | |
| Objective (ID): | Reduce economic damages to residential and non-residential properties in the Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area caused by river and coastal flooding (10015) | | |
| Delivery lead: | Fife Council | | |
| Priority: | National: | | Within local authority: |
| | 138 of 168 | | 16 of 16 |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | A flood protection study has been recommended for East Wemyss to assess whether flood storage, sediment management, modification of conveyance, flood defences and natural flood management could reduce flood risk. The study should also consider property relocation and the viability of property level protection. Natural flood management options that should be considered include runoff control, river/ floodplain restoration, sediment management and wave attenuation. The study should take a sustainable approach and consider the interaction between actions upstream and downstream and potential effects on coastal processes along the shoreline. | | |
| Potential impacts | | | |

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|-----------------------|---|
| Economic: | The study could benefit 23 residential properties and nine non-residential properties at risk of flooding in this location, with potential damages avoided of up to £930,000. |
| 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 flood protection study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. |
| 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. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Firth of Forth Special Protection Area. Scheduled monuments, gardens and designed landscapes, 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 (100130018) | | |
| Objective (ID): | Reduce economic damages and number of residential properties at risk of surface water flooding in Kirkcaldy and Cluny where practical (10013) | | |
| Delivery lead: | Fife 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): | STRATEGIC MAPPING AND MODELLING (100990016) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | SEPA | | |
| Status: | Not started | Indicative delivery: | 2016-2021 |
| Description: | SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 2,600km ² of improved surface water data is currently available within this Local Plan District. The inclusion of additional surface water hazard data resulting from the completion of local authority surface water management plans and Scottish Water integrated catchment studies will be considered when these projects are completed. | | |

| | | | |
|------------------------|--|----------------------|------------------|
| 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 (100150017) | | |
| Objective (ID): | Reduce economic damages to residential and non-residential properties in the Kirkcaldy, East Wemyss and Methil Potentially Vulnerable Area caused by river and coastal flooding (10015) | | |
| Delivery lead: | Fife Council | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | Continue to maintain the existing coastal flood defences. | | |

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|------------------------|---|----------------------|----------------|
| Action (ID): | MAINTAIN FLOOD WARNING (100990030) | | |
| Objective (ID): | Reduce overall flood risk (10099) | | |
| Delivery lead: | SEPA | | |
| Status: | Existing | Indicative delivery: | Ongoing |
| Description: | Continue to maintain the Leven and Methil, Burntisland to Aberdour, Kinghorn and Kirkcaldy flood warning areas which are part of the Firth of Forth and Tay coastal flood warning scheme. | | |

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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. SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fire Council and community resilience groups and participate in property level protection events delivered by the Scottish Flood Forum 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: | Fife Council, 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: | 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. Fife Council operates an Emergency Flood Plan. Fife Council also provides flood sacks for use in emergencies and has installed flood pods containing flood protection products for use in emergencies in flood risk areas. | | |

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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: | 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. | | |