

Isle of Arran (Potentially Vulnerable Area 12/08)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Brodict to Kilmory – Arran coastal

Background

This Potentially Vulnerable Area is located on the Isle of Arran in the Firth of Clyde (shown below). The area stretches from Brodict Bay to Torrylinnwater Foot in the south of the island. It is approximately 90km².

River flooding is predominantly from the Strathwhillan Burn and the Glen Cloy Burn in the north of the area, as well as the Benlister Burn and the Monamore Burn. The majority of damages are caused by coastal flooding.



There are approximately 120 residential properties at risk of flooding. The Annual Average Damages are approximately £390,000.

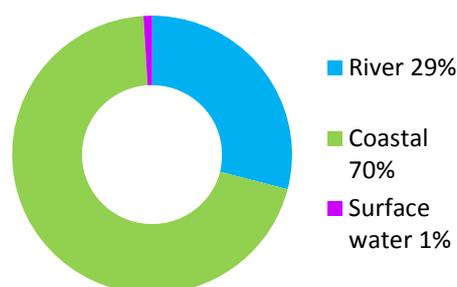


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The Glen Cloy Burn and the Strathwhillan Burn affect areas in Brodict with risk to residential and non-residential properties. In Margnaheglis, the Blairmore Burn presents a risk of flooding to a number of residential properties. Flooding from the Benlister Burn is also predicted to affect residential and non-residential properties in Lamlash.

Coastal flooding is not widespread throughout the area, however, there a number of residential and non-residential areas at risk. The national assessment of coastal flood risk does not include flooding from wave overtopping. There is potential for an increased risk from coastal sources as wave overtopping is considered to be a risk in this area. In Brodict, coastal flooding is predicted to cause flooding of the A841 and nearby properties. Properties along the A841 within Lamlash and south toward the Benlister Burn are at risk of coastal flooding. Coastal erosion is known to occur in the area of Brodict beach and particularly at Brodict golf course.

Interaction between sources of coastal and river flooding is predicted to occur in the lower reaches of the four watercourses, the Glen Cloy Burn, Strathwhillan Burn, Blairmore Burn and Benlister Burn, where they enter the Firth of Clyde.

Residential properties affected by river flooding experience the highest economic impact at approximately 60% of the damages.

Most impacts are within Brodick, Lamlash and Whiting Bay with flooding to people, non-residential properties and roads and to three designated cultural heritage sites along with small areas of environmentally designated sites.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Isle of Arran Potentially Vulnerable Area 12/08.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_08_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/08

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. The objectives below have been set for Isle of Arran Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding actions

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 Isle of Arran Potentially Vulnerable Area.

Summary of flooding actions

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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Brodick and Lamblash Flood Protection Studies			
Shoreline Management Plan					

The Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2022.

Actions to manage flooding in Potentially Vulnerable Area 12/08

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	The Ayrshire Shoreline Management Plan is currently under development by North and South Ayrshire Councils who are working in partnership to complete this study by 2021. The objective of this study is to provide North and South Ayrshire Council with a document to outline the long term 100 years management of the Ayrshire Coastline and inform planning and policy makers on the coastal change processes. It will be used when setting priorities for coastal defence management. It will take into account the issues of public safety, the preservation of property and infrastructure, the preservation (and where possible the enhancement) of the environment and the likely costs of defence management along a coastline. This report will provide an understanding of the processes shaping the coast, based on a mixture of geomorphological analysis, interpretation of available data in waves, tides, movements of beach sediment and past shoreline changes. This study is not limited to Potentially Vulnerable Areas but should cover the whole of the Ayrshire coastline and any areas beyond this which may be influenced by changes in coastal processes.
Timing and status:	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018. As part of the Ayrshire SMP, which is currently underway, a gap study for the Isle of Arran is currently progressing, which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Further impacts will be assessed by the local authority.

Action (ID):	FLOOD PROTECTION STUDY (120230005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and

	<p>coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG). These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
<p>Timing and status:</p>	<p>As part of the Ayrshire SMP, which is currently underway, a gap study for the Isle of Arran is currently progressing, which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study. Flood risk assessment studies on the Monamore, Benlister and Glen Cloy Burn is proposed to be progressed in 2018 onwards.</p>
<p>Funding:</p>	<p>This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.</p>
<p>Coordination:</p>	<p>The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.</p>
<p>Potential Environmental Impacts:</p>	<p>Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. To be in accord with the flood risk management strategy, the responsible authority will seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Arran Moors Special Protection Area. Sand dune restoration at Brodick and Lamash has the potential to impact upon the coastal processes and sediment supply in the area, with the potential for impacts on Cloughlands Point Site of Special Scientific Interest. The impacts could be positive or negative and would require further study. Dune restoration in the area could provide greater areas of habitat for flora and fauna to colonise. There are no international level environmental designations that are likely to be directly impacted by this conveyance action. There is the potential for this action to have short term temporary impacts through disturbance to species and reduced water quality during construction. Increasing conveyance in these watercourses may increase erosion downstream of the action.</p>

Potential Environmental Impacts:	There is likely to be a direct loss of natural and semi-natural habitat in the footprint and vicinity of the defences. There is the potential for temporary negative impacts on the connectivity to the Arran Moors Special Protection Area and Site of Special Scientific Interest along the Benlister Burn and Glen Cloy Burn during construction works. There is the potential for negative impacts on WFD status from this action. There are no local level environmental designations that are likely to be impacted by these actions. Improved design of the culverts may enable better fish passage. There may be temporary negative impacts to water quality during construction. There are unlikely to be significant impacts on heritage features from this action, however sensitive construction may be required in the vicinity of the Brodick Parish Church listed buildings.
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Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120230017)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	There are a range of formal and informal coastal defences in Brodick and Lamlash. These defences offer some level of protection to the properties in this area. North Ayrshire Council will continue to inspect and maintain the Brodick and Lamlash coastal flood defences, which will continue to manage flooding according to the design standard at the time of construction. The Largs Flood Protection Scheme has an annual general inspection regime to ensure integrity and peak efficiency. The sea defences will be maintained as part of the Council's coastal asset management programme. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Arran Lamlash Cordon and the Arran Seafront and Montrose Terrace flood warning areas which are part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Brodich and Lamlash. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.

Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. North Ayrshire Council support local Flood Action Groups at Brodick. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Brodick, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water websites.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders,

Coordination:	including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.
Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.
Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders

Action Description:	The Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies Team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to: Mitigate the harmful effects of the emergency on the environment; bring about a swift return to normal life in the communities and environment affected; and encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy P18: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy P18 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy P18 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key</p>

	<p>stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <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 SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA's website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.