

RPS

Ayrshire Shoreline Management Plan

Strategic Environmental Assessment

Environmental Report

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Strategic Environmental Assessment Environmental Report

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TABLE OF CONTENTS

NON-TECHNICAL SUMMARY	VI
1 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 STRATEGIC ENVIRONMENTAL ASSESSMENT	1
1.3 STUDY TEAM	2
1.4 SCREENING FOR SEA	2
1.5 SCOPING FOR SEA	3
1.6 SEA GUIDANCE	5
1.7 STATUTORY CONSULTEES FOR SEA	5
1.8 APPROPRIATE ASSESSMENT	5
2 AYRSHIRE SHORELINE MANAGEMENT PLAN DEVELOPMENT STRATEGY	7
2.1 BACKGROUND	7
2.2 LOCATION AND EXTENT	7
2.3 OBJECTIVES	9
3 METHODOLOGY AND CONSULTATIONS	11
3.1 METHODOLOGY	11
3.2 SEA OBJECTIVES	12
3.3 COMPATIBILITY OF OBJECTIVES	15
3.4 CONSULTATIONS	15
3.4.1 Proposed Consultation on Draft Plan and SEA Environmental Report	17
3.5 INTRODUCTION	18
3.6 GEOGRAPHIC SCOPE	19
3.7 TEMPORAL SCOPE	23
4 BASELINE AND RELEVANT ENVIRONMENTAL ISSUES	24
4.1 INTRODUCTION	24
4.2 BIODIVERSITY, FLORA & FAUNA	24
4.3 POPULATION & HUMAN HEALTH	29
4.4 GEOLOGY, SOILS & LANDUSE	30
4.5 WATER	31
4.6 CLIMATE	31
4.7 MATERIAL ASSETS	32
4.8 CULTURAL, ARCHAEOLOGICAL & ARCHITECTURAL HERITAGE	33
4.9 LANDSCAPE & VISUAL AMENITY	34
4.10 EVOLUTION OF THE ENVIRONMENT IN THE ABSENCE OF THE PLAN	34
5 REVIEW OF RELEVANT, PLANS, PROGRAMMES AND POLICIES	37
5.1 INTERACTION WITH OTHER RELEVANT PLANS AND PROGRAMMES	37
6 PROPOSED MANAGEMENT POLICIES / ACTIONS	39
6.1 DEVELOPMENT OF SHORELINE MANAGEMENT POLICIES	39

6.2	POTENTIAL ACTIONS TO ACHIEVE POLICIES	42
7	ASSESSMENT	45
7.1	DO NOTHING	45
7.2	SUB-CELL 6B1	48
7.3	SUB-CELL 6B2	55
7.4	SUB-CELL 6C1	60
7.5	SUB-CELL 6C2	66
7.6	SUB-CELL 6C3	73
7.7	SUB-CELL 6C4	79
7.8	SUB-CELL 6C5	86
7.9	SUB-CELL 6C6	90
7.10	SUB-CELL 6D1	97
7.11	SUB-CELL 6D2	103
7.12	SUB-CELL A1	107
7.13	SUB-CELL A2	114
7.14	SUB-CELL A3	120
7.15	SUB-CELL A4	126
7.16	SUB-CELL GREAT CUMBRAE	132
7.17	CUMULATIVE / IN-COMBINATION DEVELOPMENT IMPACTS	137
8	MITIGATION AND MONITORING	139
8.1	MITIGATION	139
8.1.1	General Mitigation	139
8.1.2	Mitigation by Environmental Impact	140
8.1.3	HRA Mitigation	143
8.2	MONITORING	144
9	SUMMARY AND CONCLUSIONS	148
10	NEXT STEPS	150
11	REFERENCES	152

LIST OF FIGURES

Figure 1.1	Overview of SEA Process	2
Figure 2.1	Proposed Shoreline Management Plan - Extent	8
Figure 3.1	Coastal sub-cell boundaries for the Ayrshire and Arran coastlines.....	22
Figure 4.1	European sites within the vicinity of the Ayrshire shoreline	25
Figure 4.2	SSSIs within the vicinity of the Ayrshire shoreline.....	27
Figure 4.3	LNRs, MCAs and MPAs within the vicinity of the Ayrshire shoreline.	28
Figure 6.1:	Ayrshire SMP Policy Units.....	40

LIST OF TABLES

Table 1.1	Summary Descriptions of Main Stages in SEA Process	1
Table 1.2	Potential Environmental Issues by SEA Topics	4
Table 2.1	Summary of Ayrshire SMP Policies.....	9
Table 3.1	Description of SEA Environmental Impact Scores	12
Table 3.2	Strategic Environmental Objectives.....	13
Table 3.3	Compatibility of Objectives	15
Table 3.4	Proposed Elements of the Plan to be Assessed	18
Table 3.5	Coastal Sub-Cell Extents.....	20
Table 5.1	Summary of Key Plans and Programmes Relevant to the Ayrshire SMP	37
Table 6.1	Ayrshire SMP Policy Units and Policy	41
Table 6.2	Long List of Potential Actions to Manage Shoreline.....	43
Table 8.1	Proposed Mitigation Measures.....	140
Table 8.2	Proposed HRA Mitigation Measures	143
Table 8.3	Environmental Monitoring of the SMP	146

Table 10.1	Draft Anticipated Milestones.....	150
Table 10.2	Proposed Timescale for SEA of the Ayrshire Shoreline Management Plan	150

APPENDICES

APPENDIX A	SEA Screening Responses	6 Pages
APPENDIX B	SEA Guidance	1 Page
APPENDIX C	SEA Scoping Responses	9 Pages
APPENDIX D	Stakeholder Scoping Responses	3 Pages
APPENDIX E	Plans and Programmes	19 Pages
APPENDIX F	SEA Scoring Guidance	7 Pages

ABBREVIATIONS

AA	Appropriate Assessment
BGS	British Geological Survey
EIA	Environmental Impact Assessment
ESA	Environmentally Sensitive Area
EU	European Union
GHG	Greenhouse Gas
IED	Industrial Emissions Directive
HRA	Habitats Regulation Appraisal
LA	Local Authority
LAP	Local Area Plan
LNR	Local Nature Reserve
MoD	Ministry of Defence
P/P	Plan / Programme
PPC	Pollution Prevention and Control
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SEO	Strategic Environmental Objective
SEPA	Scottish Environment Protection Agency
SMP	Shoreline Management Plan
SNH	Scottish Natural Heritage
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WFD	Water Framework Directive
WHS	World Heritage Site
WTW	Water Treatment Works
WWTW	Waste Water Treatment Works

NON-TECHNICAL SUMMARY

INTRODUCTION

The requirement of the Ayrshire Shoreline Management Plan (SMP) was identified by the Scottish Environment Protection Agency (SEPA), North Ayrshire Council and South Ayrshire Council, through the development of the Ayrshire Regional Flood Risk Management Strategy. The Ayrshire SMP aims to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management; essentially providing an agreed high level approach, intent and framework for management. In addition, the Ayrshire SMP aims to provide guidance to planners, and to individuals and organisations, with interests in the coast; setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for the sustainable use of the coastal zone, to guide others in developing their own planning. The Ayrshire SMP is being developed in partnership with the operating authorities and those other organisations with key roles in shoreline management.

The SEA Directive has been implemented in order to integrate environmental considerations into the preparation of plans and programmes and is a means of ensuring a high level of protection for the environment, while also promoting sustainable development. The SEA Directive will ensure that consideration is given to the environment in developing the Ayrshire SMP.

METHODOLOGY AND CONSULTATION

This SEA Environmental Report has been produced to assess the environmental impacts of the various measures available to the Plan and to provide the environmental guidance to help create a more sustainable Plan. In parallel to this, a Habitats Regulation Appraisal (HRA) has been prepared to inform the decision making process, in terms of the potential measures to impact upon the integrity of any European sites in view of site conservation objectives.

Each alternative policy available to the Plan has been assessed in the short, medium and long term for likely effects, the significance of the effects, and whether they are positive or negative effects against the SEA objectives. Other impacts that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the interrelationship of effects. The scenario of 'The Evolution of the Environment without the Plan' has also been assessed in the same format. This will be considered the Do-Nothing Scenario.

An SEA Scoping Report for the SMP was circulated on the 24th April 2017 to the following statutory consultees:

- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Historic Environment Scotland (HES)

Non-statutory stakeholders were also provided with this Scoping Report and all information was made publically available via the North Ayrshire Council and South Ayrshire Council websites.

DESCRIPTION OF THE PLAN

The SMP is a large-scale assessment of the risks associated with coastal processes. It identifies policies to manage these risks to people and the developed, historic and natural environment.

The SMP will cover the period from 2017 to 2117, split into 3 epochs of short term 0 - 20 years, medium term 20 – 50 years and long term 50 – 100 years. The SMP will be reviewed periodically for updates and to monitor progress and impacts.

ENVIRONMENTAL BASELINE

An environmental baseline was produced by SEA environmental topic. The purpose of the following section is to demonstrate the level of baseline environmental information to be used in the assessment of potential impacts of the shoreline management policy options.

Biodiversity, Flora and Fauna

There are a wide variety of protected natural habitats within the SMP area. There are 10 Special Areas of Conservation (SACs) within 15km of the coastal sub-cells. These are designated under the Habitats Directive (92/43/EEC) and include the likes of Bankhead Moss, the Lendalfoot Hills Complex and Tarbert Woods. There are also seven Special Protection Areas (SPAs) within 15km of the sub-cells. These are designated under the Birds Directive (EC/79/409 as amended by Directive 2009/147/EC) and include areas such as Renfrewshire Heights, Alisa Craig and Arran Moors. Together these SACs and SPAs form part of the Natura 2000 Network.

There are a large number of Sites of Special Scientific Interest (SSSIs) within 1km of the Plan Area. These include the Portencross Coast and Arran Northern Mountains. There is also one Marine Protected Area (MPA) and two Marine Conservation Areas (MCAs) within the Plan area. There are three Local Nature Reserves (LNRs) within the Plan area also.

In addition to the various designated areas which can be found, there are also a wide range of valued species within the various sub-cells. For instance, fish species such as sole, anglerfish, blue whiting and cod are common along the Ayrshire coast. This region also hosts populations of cetaceans, the likes of which include harbour porpoise, minke whale and various dolphin species; as well as populations of shark and ray. There are two seal haul-out sites within the Plan area.

Population and Human Health

The census undertaken in 2011 found there to be approximately 138,150 people living within North Ayrshire. Of this population 79% consider their health to be either 'good' or 'very good'.

These figures are broadly similar to those of South Ayrshire where, according to the 2011 census, approximately 112,800 people live. 81% of this population consider their health to be either 'good' or 'very good'.

When considering the entirety of the Ayrshire coastline, the northern aspect of the region is more densely populated comparative to that of the south. Residents along the coast are predominantly concentrated within settlements such as Largs, Ardrossan and Irvine with settlements such as Troon and Ayr towards the centre of the region and Girvan to the south. On the Isle of Arran, the local population resides, for the most part, within coastal valley settlements such as Brodick and Lamlash to the east of the island.

The risk of coastal flooding and erosion is present throughout the Plan area.

Geology, Soils and Landuse

On the mainland, the soil of Ayrshire is largely made up of brown soils with some regosols, alluvial soils and mineral gleys. On the Isle of Arran, the soil is largely comprised of mineral gleys with some brown soils. Often, these are derived of raised beach sand and gravel, old red sandstone and arenaceous/metamorphosed argillaceous schists.

The coastal bedrock geology of the area is, for the most part, made up of interbedded sandstone and conglomerate with breccia, siltstone and mudstone also. The seabed is largely comprised of deep circalittoral mud, sponge communities and deep circalittoral rock, and both deep and shallow circalittoral coarse sediment.

The land within the study area has a wide variety of uses including industry, retail, housing and leisure tourism.

Water

The Ayrshire shoreline is split up into two River Basin Districts (RBDs). Making up these RBDs are a number of coastal and transitional waterbodies; as well as designated bathing waters. For the most part, coastal waterbodies within Ayrshire are given an overall status of Good or Moderate, with an ecological status of Good or Moderate and a chemical status of Pass. Similarly, transitional waterbodies within Ayrshire are largely given an overall status of Good and an overall chemical status of Pass. With that being said, unlike their coastal counterparts, some of the transitional waterbodies have been awarded an ecological status of Bad or Poor. The majority of bathing waters within Ayrshire have an overall status of Poor.

Climate

The climate of Western Scotland is relatively mild. Autumn and winter are the wettest seasons whilst spring and summer are the driest. With regard to the Ayrshire marine environment, the annual mean near-bed temperature is between 9.59°C and 9.64°C and sea surface temperature throughout the Plan area is approximately 9.85°C.

The predicted impacts of climate change are likely to include increases in annual mean temperatures, precipitation, sea levels and storminess. These effects of climate change are likely to increase coastal

flooding and will require future development to be adaptable or resilient to future climatic changes and its associated impacts.

Material Assets

Development along the Ayrshire coastline varies between rural areas of low density development and built up urban settlements. Such settlements are connected by road and rail and host a variety of infrastructure and material assets such as power stations and Industrial Emissions Directive (IED) Sites.

Sub-sea infrastructures, such as power and telecommunications cables, are situated within many of the Plan area's sub-cells. These work so as to connect the Isle of Arran (and Holy Isle), Great Cumbrae and Northern Ireland to the Scottish mainland.

Cultural, Architectural and Archaeological Heritage

There are a large number of heritage features within the Plan area. These include 1,784 listed buildings, 117 scheduled monuments and 21 Conservation Areas. There are also 21 designated gardens and landscapes; many of which are lands associated with historic assets such as Culzean Castle.

Within the waters of the Plan area there are a large number of vessels which are presumed to have been lost. There are also a number of wrecks which have been found along the coastline.

Landscape and Visual

The mainland aspect of the study area is largely defined by its raised beaches and coastal lowland. The use of these areas of land varies but they are often farmed; producing some of the more productive agricultural land in Ayrshire.

Compared with surrounding areas, the northern aspect of the mainland coast is heavily populated; with many of the local settlements having expanded beyond their original sites. They often now take the form of ribbon settlements along coastal roads.

The landscape on the Isle of Arran and Great Cumbrae is defined by its lowland fringe which incorporates areas of raised beach which broaden where valleys reach the coast. Such valleys provide a focus for larger settlements such as Brodick, Lamlash and Millport whilst the raised areas are characterised by narrow, linear villages such as Corrie and Pirmill.

Evolution of the Environment in the Absence of the Plan

The evolution of the environment in the absence of the Plan was assessed in this SEA Environmental Report. In the absence of the Strategy i.e. the Do Nothing Scenario, the Ayrshire shoreline will remain unmanaged, without maintenance, and ill-adapted for climatic change. The likely future impacts of this are provided by environmental topic.

REVIEW OF RELEVANT PLANS, PROGRAMMES AND POLICIES

A review of the Plans, Policies and Programmes relevant to the Plan was carried out at International, European, National, Regional and Sub-Regional scales. This exercise was carried out with a view to establishing the hierarchical position of the SMP, the influence these Plans and Programmes will have on the SMP and how the SMP will interact with the objectives of these other Plans.

ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

The proposed measures for consideration have been assessed against the SEA Objectives to examine the likely significant environmental impacts of the SMP. These are referred to as the Strategic Environmental Objectives (SEOs). This assessment is relatively strategic, with the aim of reporting likely impacts at the regional level to affect the scale at which the routes are being planned. Indicators, targets and scoring guidelines were developed to help provide a consistent assessment of the proposed measures.

APPROPRIATE ASSESSMENT

A HRA for the Plan has been carried out in parallel with the SEA process. The findings of the HRA have been used to guide the development of the alternatives to be considered as part of the SEA. The findings of the HRA have been integrated into this SEA Environmental Report and subsequently into the SMP.

ALTERNATIVES

Four alternative policies were available to be adopted at each sub-cell, which were as follows:

- No Active Intervention / Do Nothing;
- Hold the Line;
- Advance the Line, or
- Managed Realignment.

As there could be several policies, asset owners and administrative boundaries within the one coastal sub-cell, these areas were split down into smaller discrete areas called policy units. In total there were 32 policy units defined across 15 sub-cells. Each policy unit was assessed individually and also cumulatively as part of a coastal sub-cell.

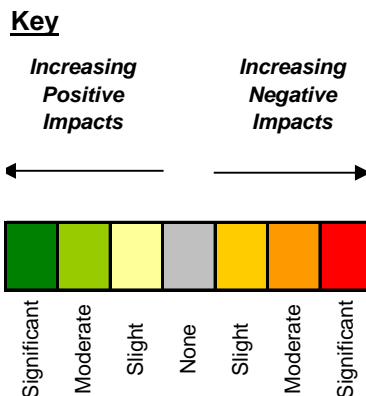
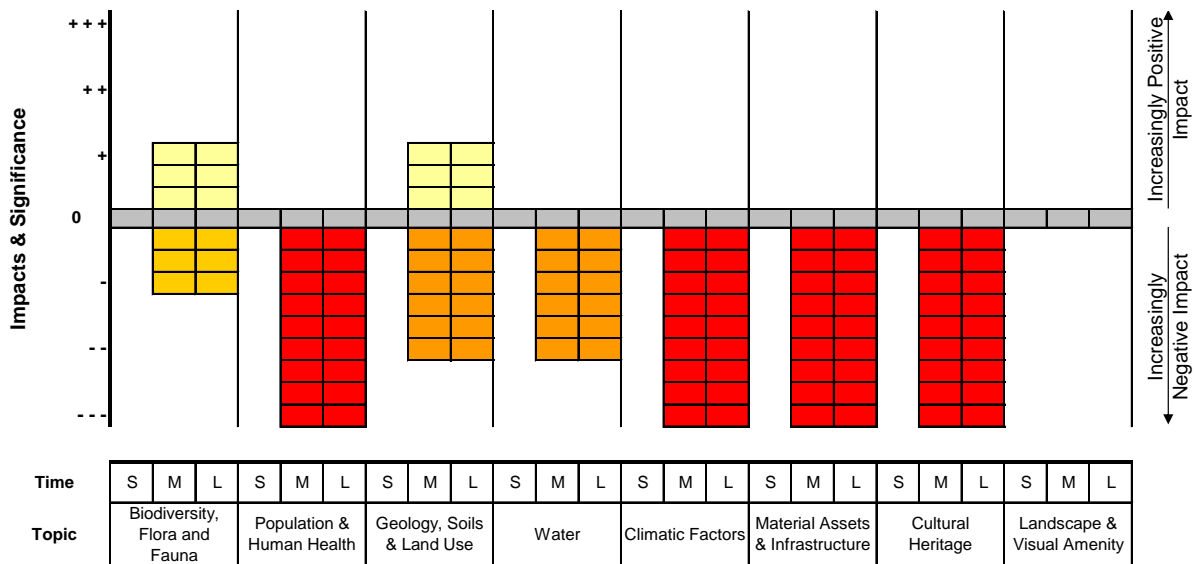
ASSESSMENT

Each alternative available to the SMP has been assessed against the SEOs. Where appropriate, a regional perspective of the potential main issues and impacts of each option has been detailed by environmental topic area. All potential positive and negative impacts are presented individually, with a

text description, and then a summary graphic. In addition, a summary of the overall balanced potential effect has been presented for each environmental issue area. The scores assigned to impacts are from +3 to -3. If a proposed measure is thought to have the potential for unacceptable impacts then a score of -999 will be assigned. The purpose of adding numerical scores is to assist in the ranking of options and for the potential incorporation of the environmental and social criteria into future decision making by the Ayrshire SMP team, as this will provide for a multi-criteria analysis of alternatives if desired. Options may have both positive and negative impacts at the same time.

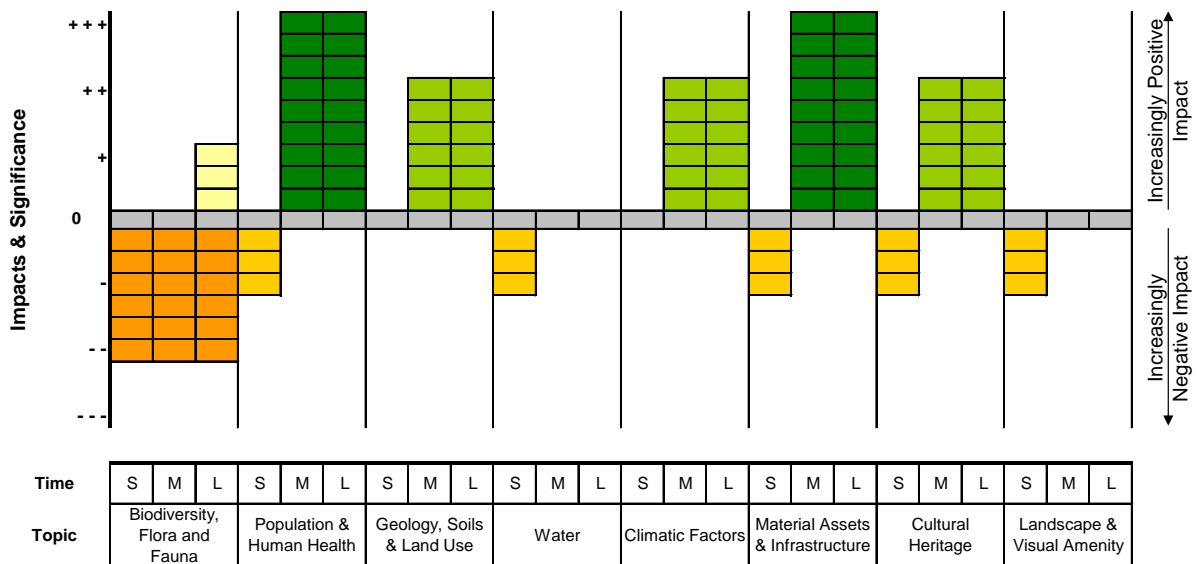
DO NOTHING

Not implementing the SMP, the Do Nothing Scenario, has the potential for medium and long term significant negative impacts on population & human health, climatic factors, material assets and archaeological, architectural & cultural heritage. There is also the potential for moderate negative impacts in the medium and long term on water quality and soils. These potential direct and indirect negative impacts are from the lack of coordinated and well planned protection of the shoreline from current and future predicted flood and erosion risk.



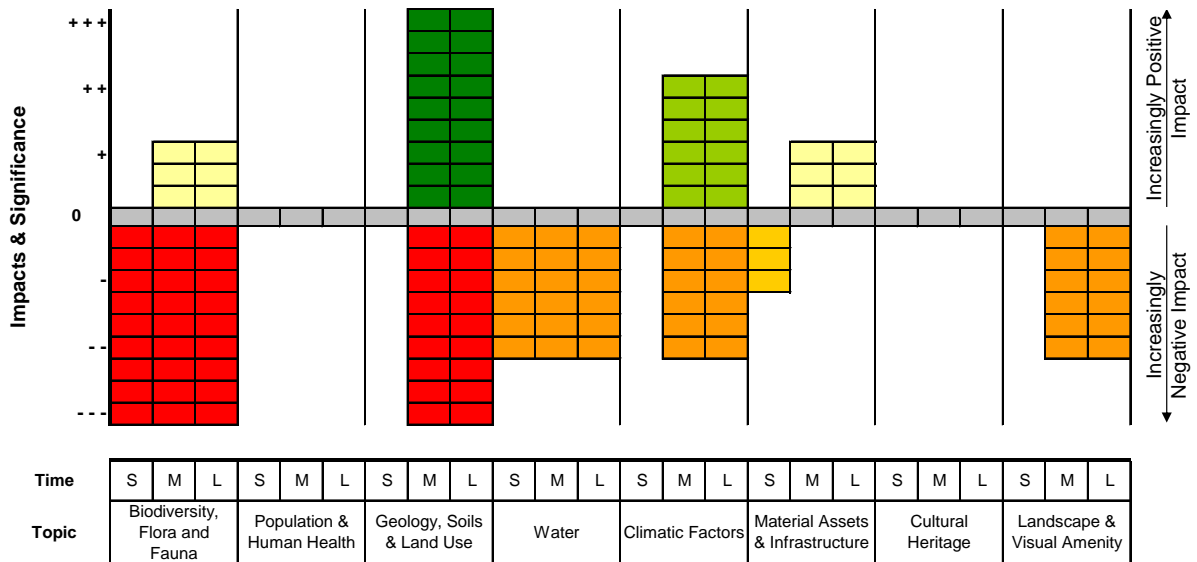
SUB-CELL 6B1

Implementing the Hold the Line policy within Sub-Cell 6B1, has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on a European site and local habitats and species. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, heritages features, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk.



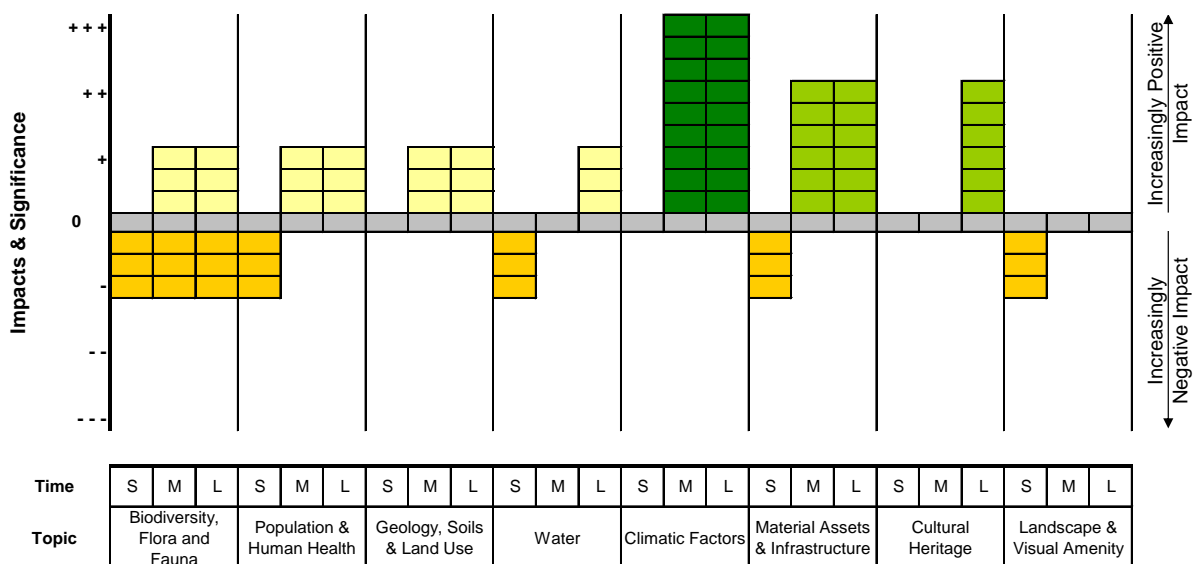
SUB-CELL 6B2

Implementing the Advance the Line and Hold the Line policies within Sub-Cell 6B2 has the potential for short to long term moderate to significant negative impacts on biodiversity, flora and fauna, due to potential impacts on the intertidal sandflats of the Southannan Sands SSSI, and on water quality from potentially increased sedimentation and contaminated sediment mobilisation. There is the potential for medium to long term significant negative impacts on coastal processes from alteration of the shoreline. There is also the potential for medium to long term moderate negative impacts on climatic factors and the local landscape from the permanent alteration of the shoreline and loss of GHG sequestering vegetation, from shoreline reclamation. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on material assets and infrastructure. There is the potential for medium to long term, slight to significant positive impacts on soils, land use, material assets and infrastructure, climatic factors and biodiversity, flora and fauna. These impacts are from creating new land resource and protecting features and assets from the current day flood and erosion risk and future predicted risk.



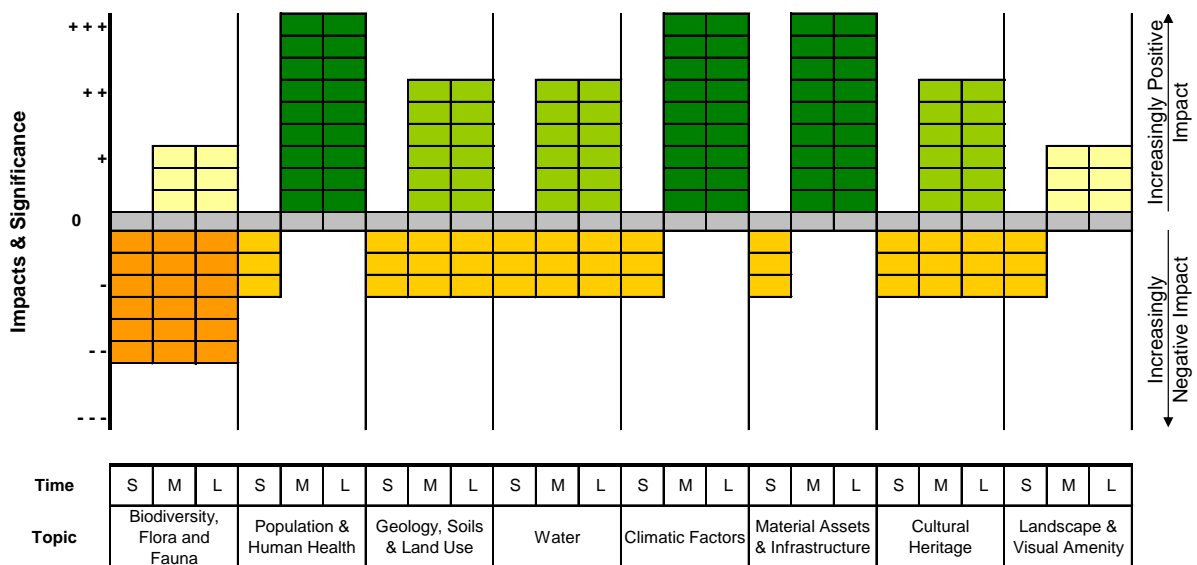
SUB-CELL 6C1

Implementing the Hold the Line policy within Sub-Cell 6C1, has the potential for short to long term slight negative impacts on local biodiversity, flora and fauna, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and potentially creating new areas for habitats to re-establish.



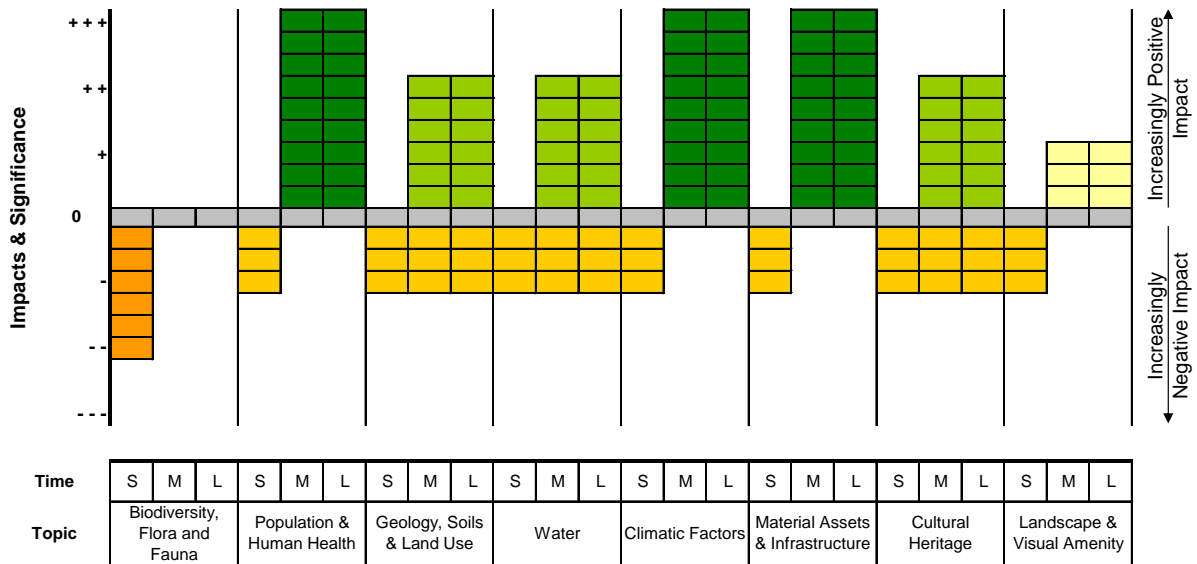
SUB-CELL 6C2

Implementing the Hold the Line policy within Sub-Cell 6C2, has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on the Bogside flats SSSI and the Western Gaiies SSSI. There is also the potential for short to long term slight negative impacts on soils and land use, water quality and heritage features, due to recurring shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, local landscape, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the habitats and aesthetics of the shoreline with soft engineering works.



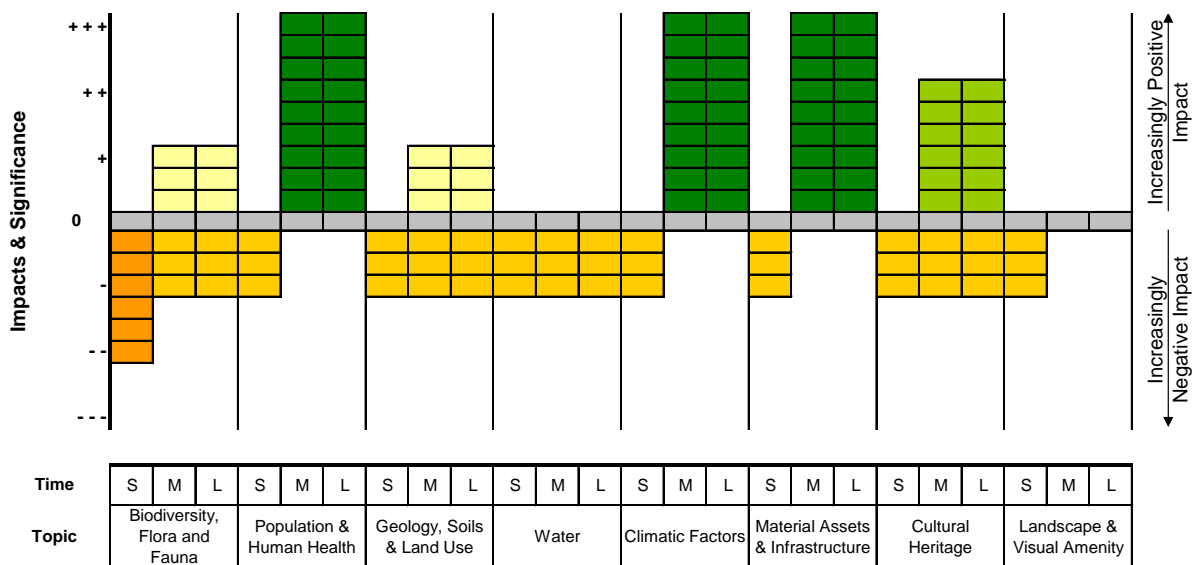
SUB-CELL 6C3

Implementing the Hold the Line policy within Sub-Cell 6C3, has the potential for short to long term slight negative impacts on soils, land use, water quality and heritage features, from recurring, localised shoreline management works. There is the potential for short term, moderate negative impacts on local biodiversity, flora and fauna, and on the sand dune systems of the Troon Golf Links and Foreshore SSSI. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, water quality, climatic factors, material assets and infrastructure, heritage and the local landscape. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the aesthetics of the shoreline with soft engineering works.



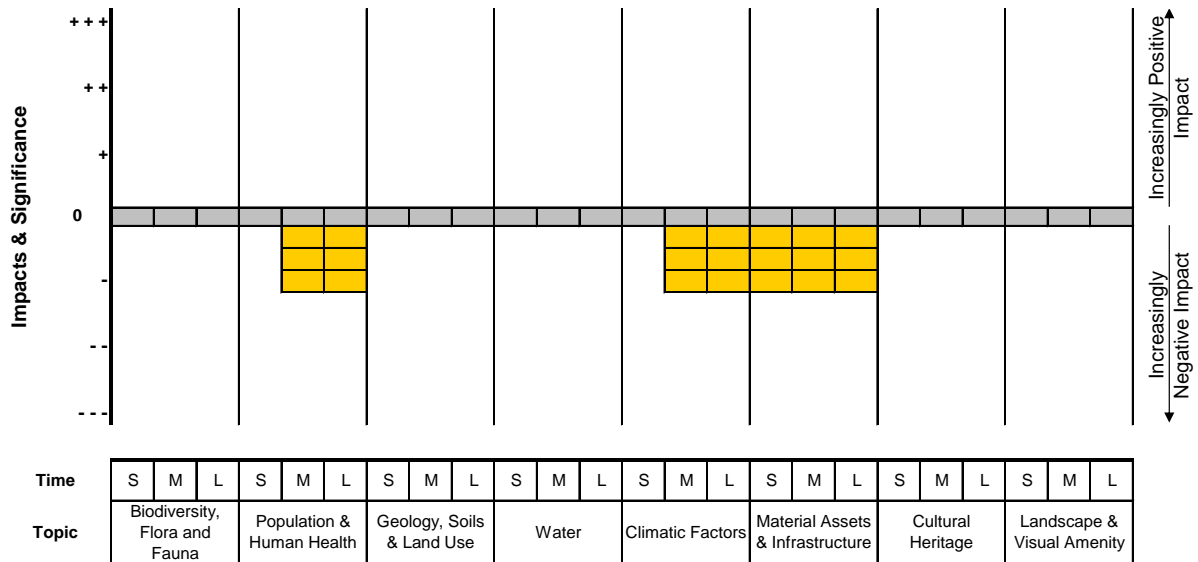
SUB-CELL 6C4

Implementing the Hold the Line and No Active Intervention policies within Sub-Cell 6C4 has the potential for short to long term, slight to moderate negative impacts on local biodiversity, flora and fauna, and on the vegetated shingle habitat of the Maidens to Doonfoot SSSI. There is the potential for short to long term, slight negative impacts on local soils, land use, water quality and heritage features, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, climatic factors, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk.



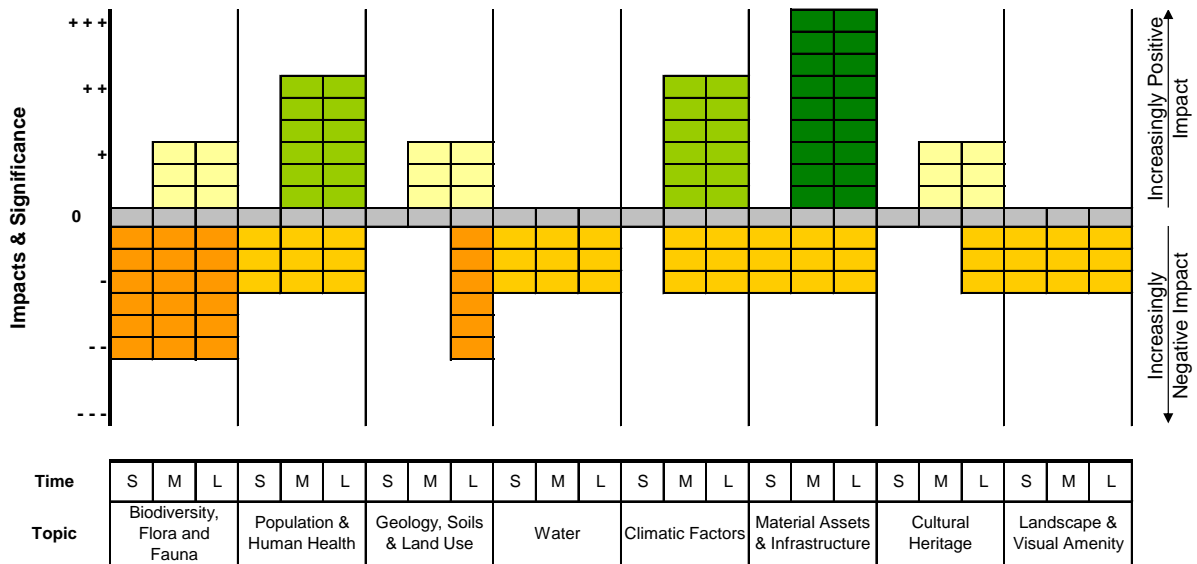
SUB-CELL 6C5

Implementing the No Active Intervention policy within Sub-Cell 6C5 has the potential for short to long term, slight negative impacts on people, climatic factors, and material assets and infrastructure. These impacts are due to the current day flood and erosion risk and future predicted risk to a small number of receptors not being managed by the policy. Individual property protection measures may however be employed to manage these risks on a case by case basis.



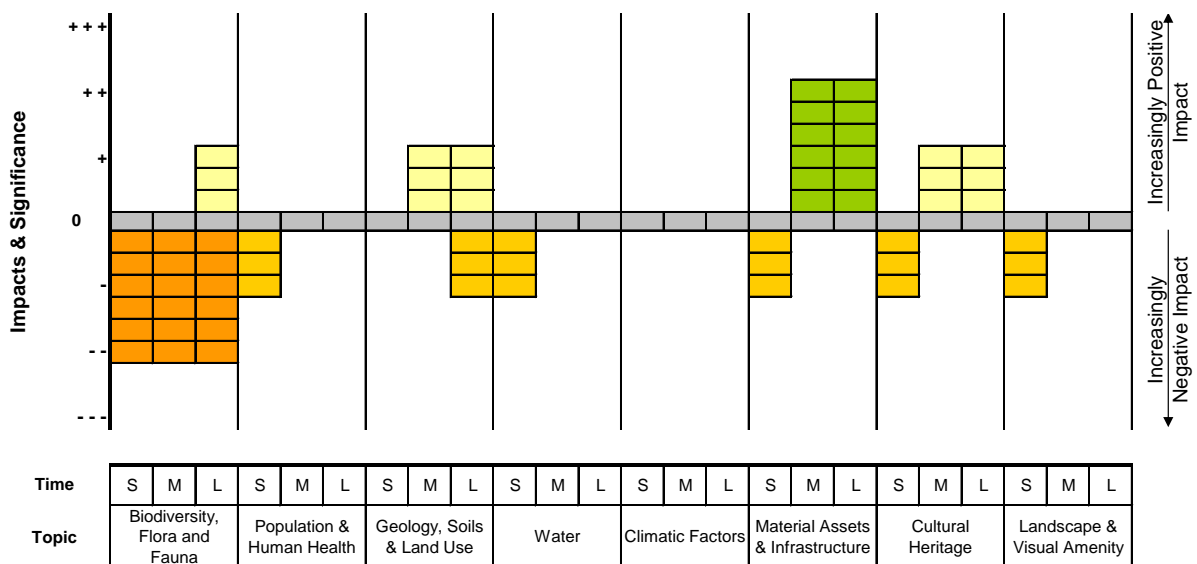
SUB-CELL 6C6

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within Sub-Cell 6C6 has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Ailsa Craig SPA that could be using the area where measures will be implemented. There is the potential for short to long term, slight negative impacts on people, water, material assets and infrastructure, and landscape and visual amenity from recurring, localised shoreline management works. There is also the potential for slight negative impacts in the medium to long term on climatic factors and heritage features from the No Active Intervention and Manged Realignment policies. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, climatic factors, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and from the potential for localised habitat creation.



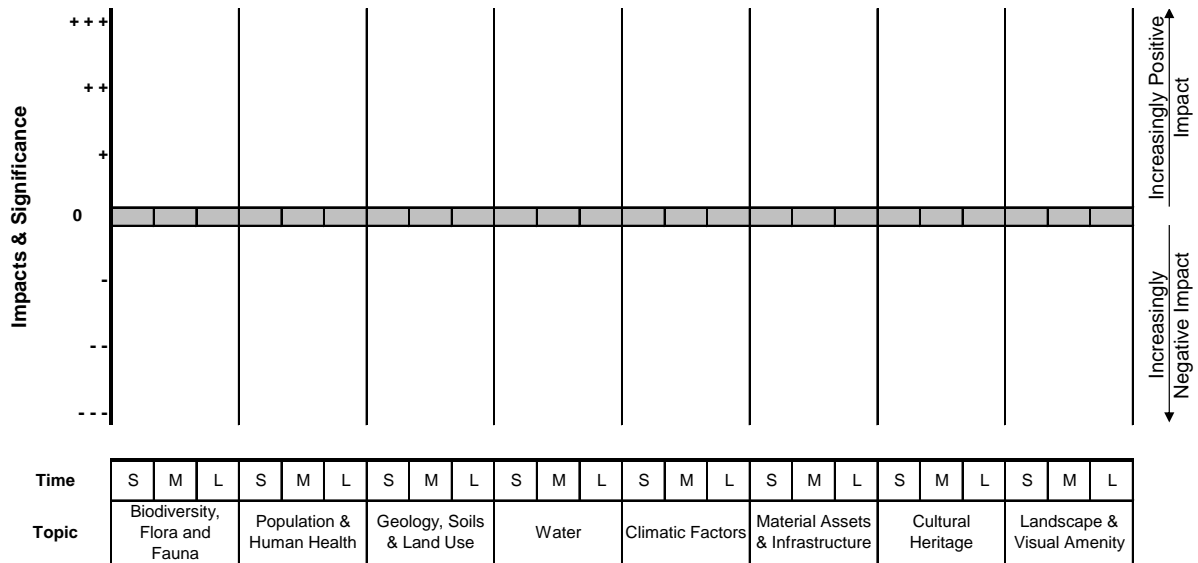
SUB-CELL 6D1

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within Sub-Cell 6D1 has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Ailsa Craig SPA that could be using the area where measures will be implemented. There is the potential for slight negative impacts on soils and land use in the long term from the potential realignment of the A77. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, heritage features, and landscape and visual amenity. There is the potential for medium to long term, slight to moderate positive impacts on soils, land use, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting features and assets from the current day flood and erosion risk and future predicted risk, and from the potential for localised habitat creation.



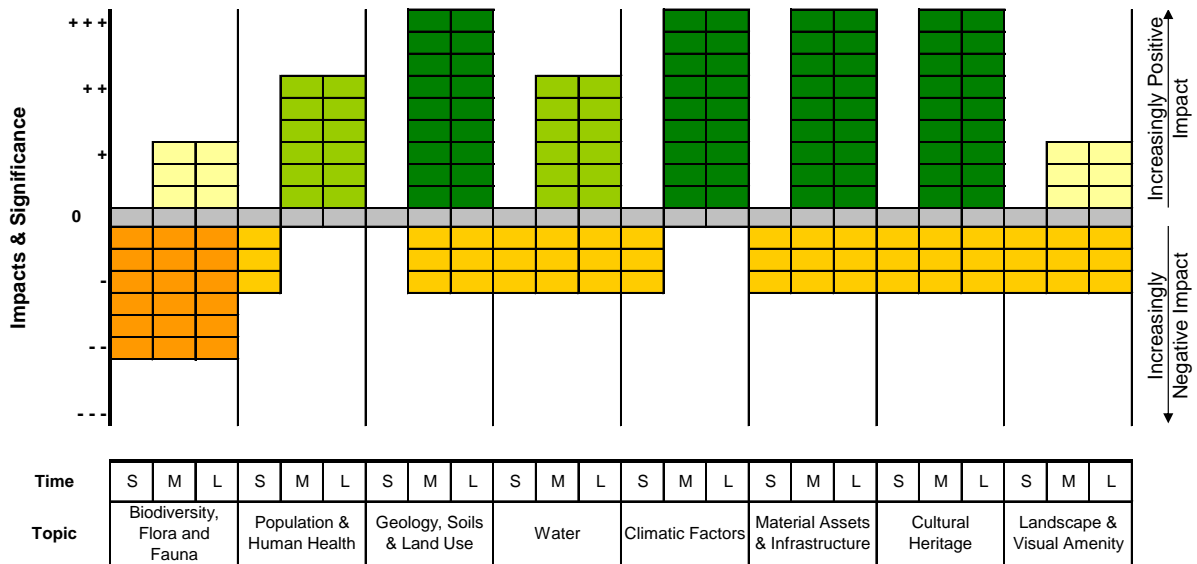
SUB-CELL 6D2

Implementing the No Active Intervention policy within Sub-Cell 6D2 is unlikely to have any impacts on any environmental topic areas in the short, medium and long term. No properties or assets are at risk of coastal flood risk or erosion in the sub-cell.



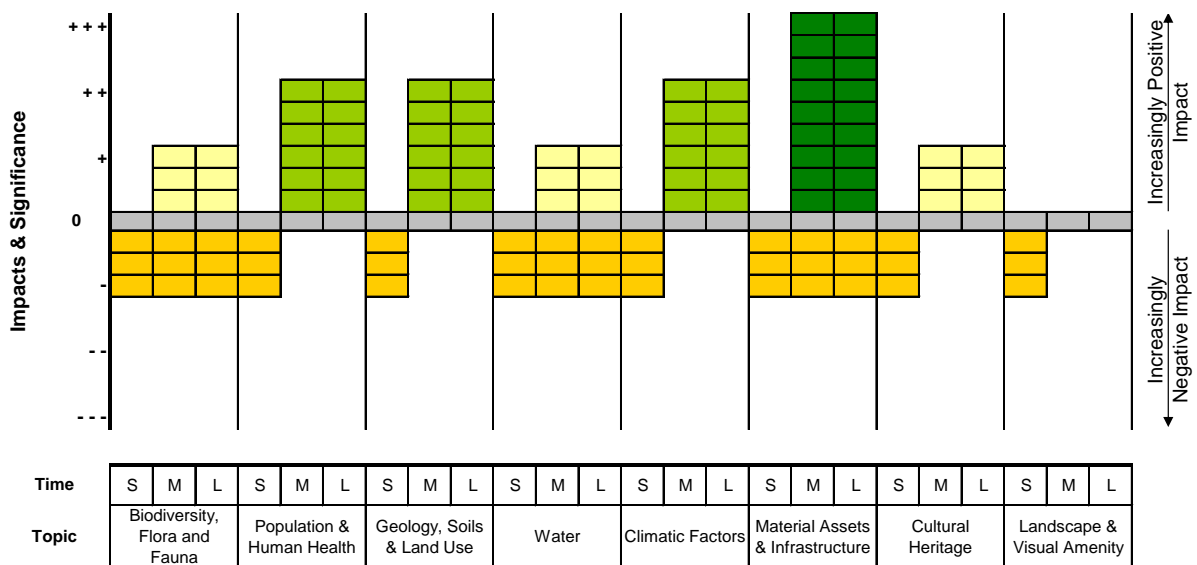
SUB-CELL A1

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within Sub-Cell A1 has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Arran Moors SSSI. There is the potential for short to long term, slight negative impacts on people, water, material assets and infrastructure, heritage features, and landscape and visual amenity from recurring, localised shoreline management works. There is the potential for slight negative impacts in the medium to long term on soils and land use from the Managed Realignment Policy, through loss of shoreline. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on the local population. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, climatic factors, water quality, climatic factors, material assets and infrastructure, heritage, local landscape, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the habitats and aesthetics of the shoreline with soft engineering works.



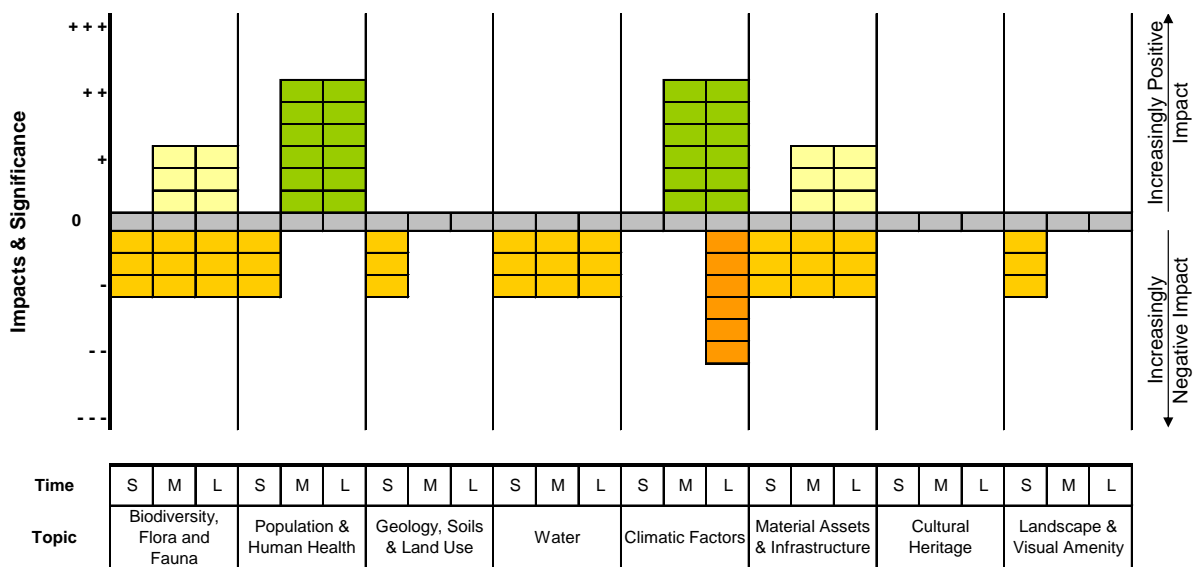
SUB-CELL A2

Implementing the Hold the Line and No Active Intervention policies within Sub-Cell A2 has the potential for short to long term, slight negative impacts on biodiversity, flora and fauna, water, and material assets and infrastructure, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, soils and land use, climatic factors, heritages features, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and potentially enhancing the habitats of the shoreline with soft engineering works.



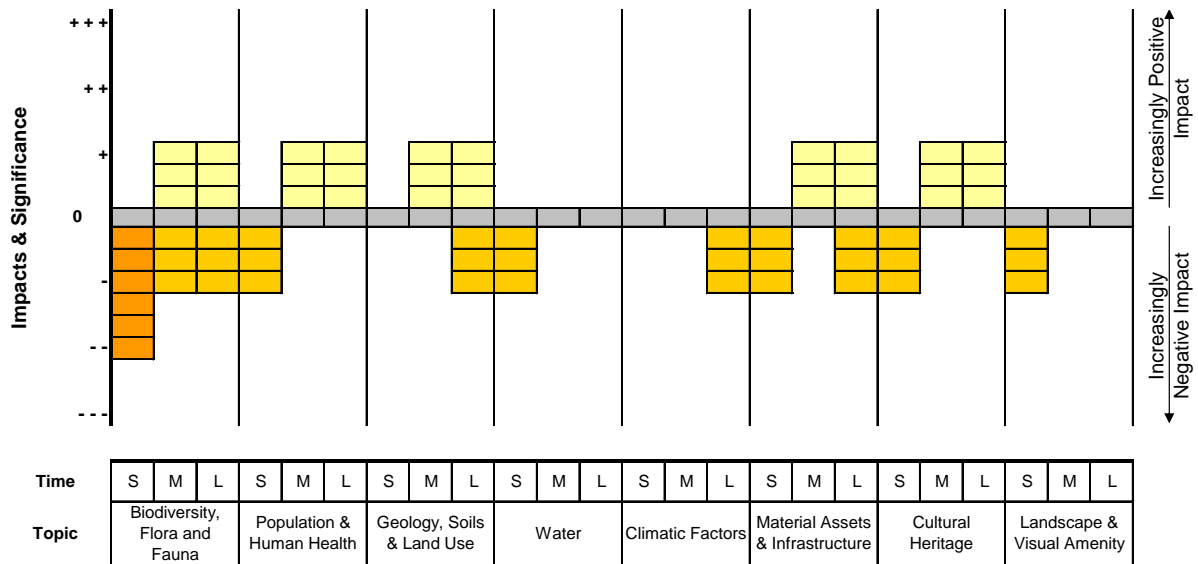
SUB-CELL A3

Implementing the Hold the Line and No Active Intervention policies within Sub-Cell A3 has the potential for short to long term, slight negative impacts on local biodiversity, flora and fauna, water quality, and material assets and infrastructure from recurring, localised shoreline management works or no protection from coastal flood risk. The No Active Intervention policy may provide long term moderate negative impacts on a few properties, from no management of climate change influenced flood risk. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, soils and land use, and landscape and visual amenity. There is the potential for medium to long term, slight to moderate positive impacts on people, climatic factors, material assets and infrastructure, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk, as well as potentially enhancing the habitats the shoreline with soft engineering works.



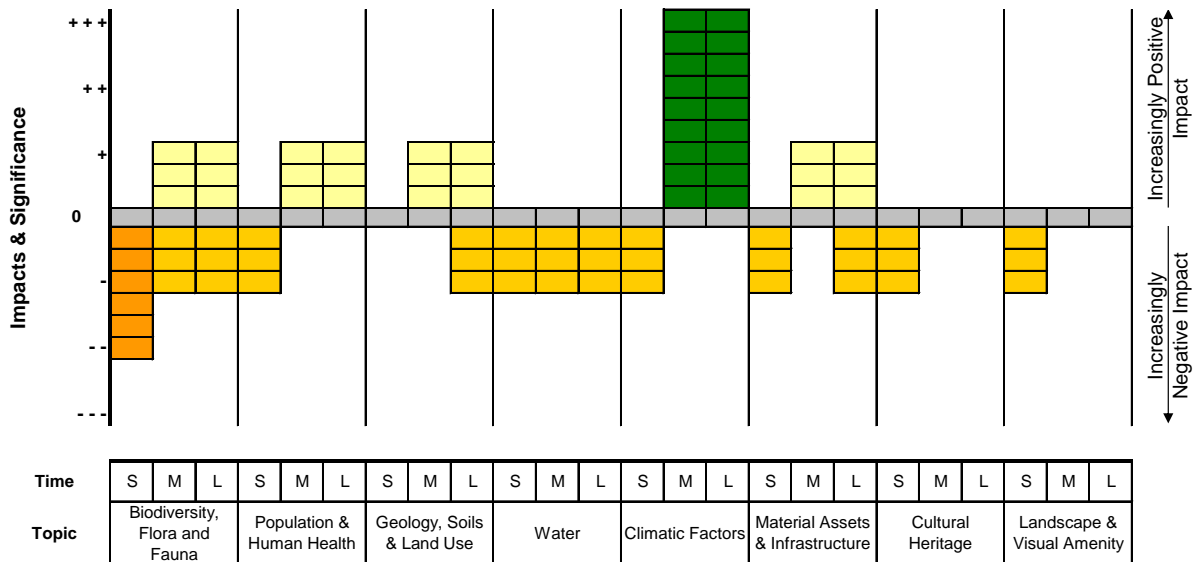
SUB-CELL A4

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within Sub-Cell A4 has the potential for short term construction phase, moderate negative impacts on the Arran Northern Mountains SSSI and medium to long term slight negative impacts on local biodiversity, flora and fauna. There is the potential for potential short term negative impacts due to construction phase disturbances on people, water quality, heritages features, and landscape and visual amenity. Then there is the potential for slight negative impacts in the long term on soils and landuse, and climatic factors from implementation of the Managed Realignment Policy, with loss of shoreline and GHG sequestering vegetation. There is the potential for medium to long term, slight positive impacts on people, soils and land use, material assets and infrastructure, heritage features, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and potentially enhancing the habitats of the shoreline with soft engineering works.



SUB-CELL GREAT CUMBRAE

Implementing the Hold the Line / Managed Realignment policy within the Great Cumbrae Sub-Cell has the potential for short term construction phase, moderate negative impacts, and recurring slight negative, medium to long term impacts on the Ballochmartin Bay SSSI and Kames Bay SSSI, along with the potential for short term construction disturbance to marine species in the Cumbraes MCA. There is the potential for short to long term, slight negative impacts on water quality from recurring, localised shoreline management works. There are the potential short term negative impacts due to construction phase disturbances on people, climatic factors, material assets and infrastructure, heritages features, and landscape and visual amenity. Then there is the potential for slight negative impacts in the long term on soils and landuse, and material assets and infrastructure from implementation of the Managed Realignment policy, with loss of shoreline and disturbance to infrastructure. There is the potential for medium to long term, slight to significant positive impacts on people, soils and land use, climatic factors, material assets and infrastructure, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk, and potentially enhancing the habitats of the shoreline with soft engineering works.



MITIGATION AND MONITORING

A number of mitigation measures for the potential impacts of implementing the Plan have been established for both the SEA and AA. Mitigation has also been proposed that can further enhance the proposed policies. This mitigation has been taken across into the SMP.

Article 10 of the SEA Directive requires that monitoring be carried out to identify at an early stage any unforeseen adverse effects due to the implementation of the Plan. Monitoring will focus on aspects of the environment that are likely to be impacted by the Plan. Where possible, indicators have been chosen based on the availability of the necessary information and the degree to which the data will allow the target to be linked directly with the implementation of the Plan. The proposed environmental monitoring is based on the Targets and Indicators established in the SEA Objectives.

NEXT STEPS

Consultation on the draft Strategy, SEA Environmental Report and AA Screening are anticipated to commence in January 2018 and run for 12 weeks. The consultation activities will take the form of Public Consultation Days, Elected Member briefings, documents made available for viewing at North Ayrshire Council and South Ayrshire Council premises, and the same documents made available digitally via their respective websites.

Following completion of the consultation period, all comments will be collated and the SMP, SEA Environmental Report and HRA will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the Plan, the final version of the SMP can be drafted and adopted. This is anticipated to be in April 2018. Following release of the adopted Ayrshire SMP, an SEA Statement will be drafted to summarise the process undertaken and identify how environmental considerations and consultations have been integrated into the Plan.

Please send all comments on the Ayrshire Shoreline Management Plan or this SEA Environmental Report of the Plan to:

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RPS Consulting Engineers
Ocean Point One,
4th Floor,
94 Ocean Drive,
Edinburgh.
Email: Danielle.King@rpsgroup.com

1 INTRODUCTION

1.1 BACKGROUND

The Strategic Environmental Assessment (SEA) Environmental Report has been prepared in accordance with the Environmental Assessment (Scotland) Act 2005, which implements European Union Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment.

The purpose of this Environmental Report is to provide a formal and transparent assessment of the likely significant impacts on the environment arising from the Ayrshire Shoreline Management Plan (SMP), including consideration of reasonable alternatives.

The Ayrshire SMP and the SEA of the Ayrshire SMP are being prepared on behalf of North Ayrshire Council and South Ayrshire Council.

1.2 STRATEGIC ENVIRONMENTAL ASSESSMENT

The SEA Directive requires that certain Plans and Programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, are subject to the SEA process. The SEA process is broadly comprised of the steps shown in **Figure 1.1**. These are given in a summary description in **Table 1.1**.

Table 1.1 Summary Descriptions of Main Stages in SEA Process

Stage	Description	Status
Screening	Determines whether SEA is required for a Plan, in consultation with the designated statutory consultees.	Completed January 2017
Scoping	Determines the scope and level of detail of the assessment for the SEA, in consultation with the designated statutory consultees.	Completed April 2017
Environmental Assessment	Formal and transparent assessment of the likely significant impacts on the environment arising from the Ayrshire SMP, including all reasonable alternatives. The output from this is an Environmental Report which must go on public display along with the draft Ayrshire SMP.	Completed November 2017
SEA Statement	Summarises the process undertaken and identifies how environmental considerations and consultations have been integrated into the final Ayrshire SMP.	Proposed for April 2018

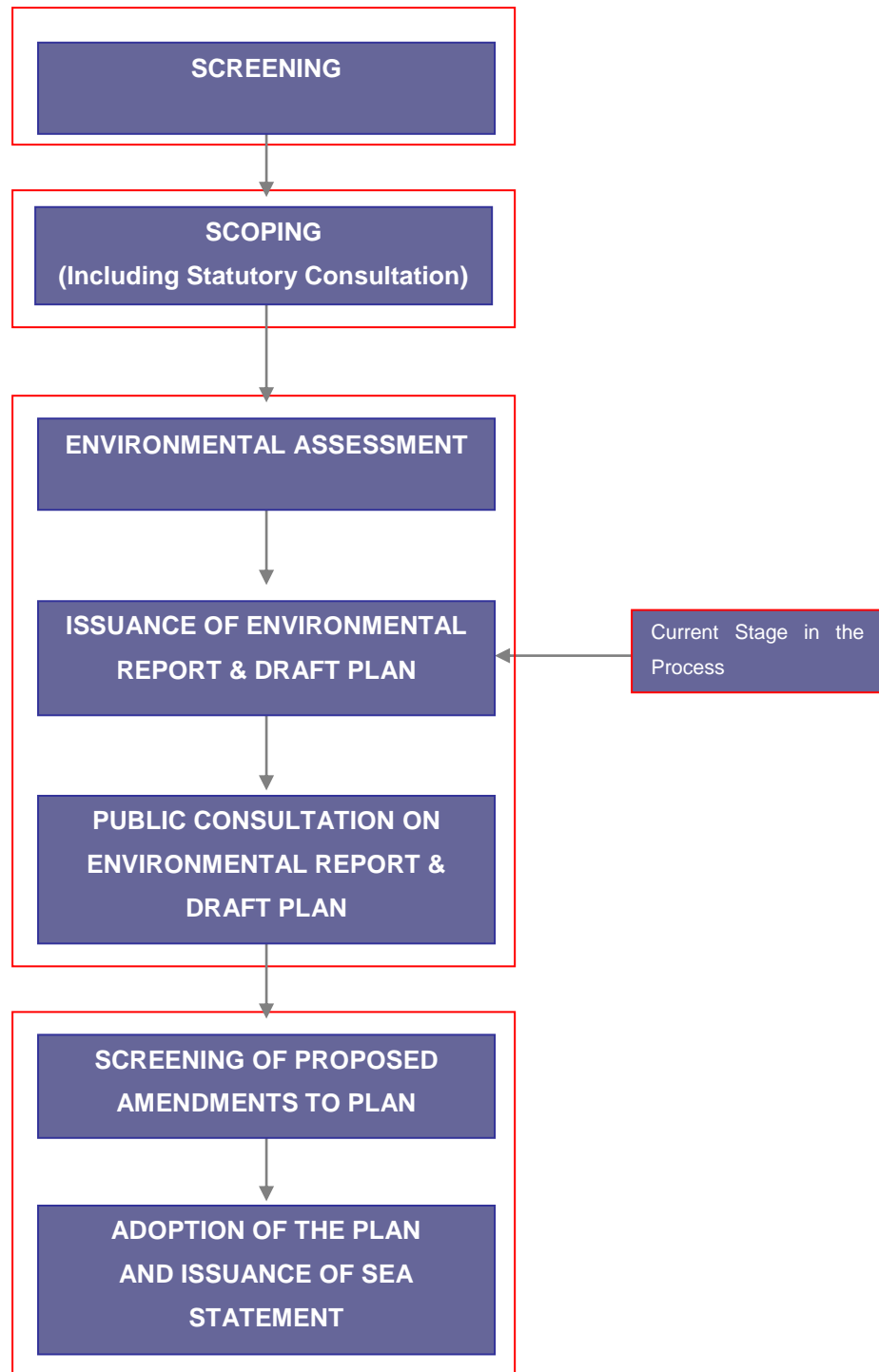


Figure 1.1 Overview of SEA Process

1.3 STUDY TEAM

The study team that developed and created the Ayrshire SMP, the SEA and the Appropriate Assessment (AA) for the Plan was made up of qualified and experienced engineers, scientists and planners. The SEA and AA professionals were involved throughout the Plan development process.

1.4 SCREENING FOR SEA

On behalf of North Ayrshire Council and South Ayrshire Council, RPS carried out an SEA Screening for the Ayrshire SMP in September 2016 to demonstrate how:

- North Ayrshire Council and South Ayrshire Council are together the Responsible Authority for the development and implementation of the Ayrshire Shoreline Management Plan.
- The Responsible Authority determined that the Ayrshire Shoreline Management Plan requires a Strategic Environmental Assessment (SEA), as the likelihood exists for significant environmental effects to arise as a result of the Plan. The Plan falls within Section 5(3) of the Environmental Assessment (Scotland) Act 2005.
- The Responsible Authority has identified that the Ayrshire Shoreline Management Plan sets the framework for future shoreline works along the Ayrshire coast, that there is the potential for significant impacts as a result of the scale and duration of effects and that sensitive receptors along the Ayrshire coast include SAC, SPA, SSSIs and LNRs.

Responses to the SEA Screening from the Scottish Environment Protection Agency (SEPA), Scottish Government, Scottish Natural Heritage and Historic Environment Scotland can be found in **Appendix A** of this report. The SEA Screening Determination was advertised in local papers and on the North Ayrshire Council and South Ayrshire Council websites. It was also provided to the environmental consultees in January 2017.

1.5 SCOPING FOR SEA

The SEA Scoping for the Plan took place from January 2017 to April 2017. The purpose of the Scoping Report was to provide sufficient information on the Plan to enable the consultees to form an opinion on the appropriateness of the scope, format, level of detail, methodology for assessment and the consultation period proposed for the Environmental Reports.

The issuing of a draft Scoping Report to consultees is recommended as good practice and can inform stakeholders about the key environmental issues and the key elements of the Plan. In addition, the Scoping Report can be used as a tool to generate comments from stakeholders on the scope and approach of the SEA.

Table 1.2 was created to generate discussion during the scoping process and consultation in relation to the SEA receptors, and was subsequently amended following scoping responses. Please note that given the limited potential for the Ayrshire SMP to impact upon, or be impacted upon by the Air topic, it was proposed to be scoped out of any further assessment.

Table 1.2 Potential Environmental Issues by SEA Topics

SEA Topics	Scoped In / Out	Environmental Awareness Issues
Biodiversity, Flora & Fauna	In	<ul style="list-style-type: none"> • Effects on protected areas: International (WHS, Ramsar), European (SACs, SPAs), National (NNRs, SSSIs), Local (LNR, Conservation Areas) • Effects on flora and fauna, (including migratory bird species etc.) • Effects on salmonids, other protected fish and shellfish species. • Effect on annex species in non-annex habitats • Effects on sensitive habitats (e.g. salt marshes) • Effects on wetlands • Effects and opportunities on refuge for fauna • Potential introduction of alien species and invasive species • Potential for habitat loss and fragmentation • Potential for habitat creation and enhancement • Potential for interaction with Habitats Directive, i.e. Article 6
Population & Human Health	In	<ul style="list-style-type: none"> • Recreational use of the area • Possible effects on tourism • Effects on connectivity of communities, both physical links and communications • Amenity value of natural environment e.g. coastal walks • Effects on disadvantaged communities • Health value of natural environment • Protection of people from flooding, erosion and wave overtopping risks
Geology, Soils and Landuse	In	<ul style="list-style-type: none"> • Land vulnerable to erosion • Land vulnerable to accretion • Erosion and soil function • Effects on coastal morphology • Effects on access to lands
Water	In	<ul style="list-style-type: none"> • Pressures and impacts on ecological status of water bodies • Morphological impacts on water bodies from engineering and other works • Water quality • Flood risk • Impacts on coastal processes
Air	Out	<ul style="list-style-type: none"> • Local impacts of construction phase plant emissions. • <i>Limited potential for significant impacts at the strategic level. Recommended to remove from future assessment.</i>
Climatic Factors	In	<ul style="list-style-type: none"> • Climate change mitigation and adaptation, including effects from severe weather events • Increased flood risk, magnitude and frequency • Increased risk of storm events and wave overtopping • Effect of carbon sinks • Effects on GHG emissions
Material Assets & Infrastructure	In	<ul style="list-style-type: none"> • Protection of assets from flooding and erosion • Residential and commercial properties • Effects on agriculture and crops • Effects on energy, transport and communications infrastructure • Effects on areas with development potential
Cultural, Architectural & Archaeological Heritage	In	<ul style="list-style-type: none"> • Nationally designated sites and monuments • Effects on water-based archaeological features • Effects on cultural heritage features in the vicinity of the shoreline • Effects on key national sites • Effects on historic and cultural landscapes

SEA Topics	Scoped In / Out	Environmental Awareness Issues
		<ul style="list-style-type: none"> • Effects on industrial and engineering archaeology • Potential for disturbance of previously undiscovered archaeological remains • Effects on areas of architectural significance • Effects on listed buildings • Effects on the setting of heritage features and areas
Landscape & Visual Amenity	In	<ul style="list-style-type: none"> • Effects on areas of designated landscape quality and scenic views • Effect on parks, gardens and amenity areas • Effects on the general landscape • Effects on historic landscapes

The responses received in relation to the Scoping for this SEA can be found in **Appendix C**.

1.6 SEA GUIDANCE

Key guidance documents that have been used in the SEA for the Plan are listed in **Appendix B** of this SEA Environmental Report.

1.7 STATUTORY CONSULTEES FOR SEA

Under Article 6 of the SEA Directive, the competent authority (in this case North Ayrshire Council and South Ayrshire Council) preparing the plan or programme is required to consult with specific 'environmental authorities' (statutory consultees) on the scope and level of detail of the information to be included in the Environmental Report.

The statutory consultees established within Scottish SEA legislation are:

- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Historic Environment Scotland

1.8 APPROPRIATE ASSESSMENT

The Habitats Directive (Council Directive 92/43/EEC) on the conservation of natural habitats and of wild fauna and flora obliges member states to designate, protect and conserve habitats and species of importance in a European Union context. Article 6(3) of the Habitats Directive requires that "*Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation*

objectives.” This Directive was initially transposed into Scottish Law through the Habitats Regulation 1994 as amended in 2004, 2007, 2008, 2011 and 2012. Any proposed plan or project that has the potential to result in a significant effect on a designated European site will require an Appropriate Assessment (AA). Case law has determined that the likelihood need not be great, merely possible, and that the precautionary principle must apply as set out in European Commission Guidance and as required by CJEU case law (i.e. C 127/02 ‘*Waddenzee*’).

An Appropriate Assessment for the Ayrshire SMP has been carried out in parallel with the SEA process. The output of this is a Habitats Regulations Appraisal (HRA), which has been prepared to influence the draft Plan and to provide Scottish Natural Heritage (SNH) with information on the draft Plan, the process undertaken for the HRA and to establish whether or not the Ayrshire SMP is likely to have a significant effect upon any European sites(s). The findings of the HRA have been integrated into this SEA Environmental Report and subsequently into the Plan.

2 AYRSHIRE SHORELINE MANAGEMENT PLAN DEVELOPMENT STRATEGY

2.1 BACKGROUND

A shoreline management plan is a large-scale assessment of the risks associated with coastal processes which identifies measures to manage these risks to people and the developed, historic and natural environment. North Ayrshire Council and South Ayrshire Council propose to develop an SMP which aims to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management; essentially providing an agreed high level approach, intent and framework for management. In addition, the Ayrshire SMP aims to 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 the sustainable use of the coastal zone to guide others in their own planning.

2.2 LOCATION AND EXTENT

The boundaries of the Ayrshire SMP are defined by the coastal extents of the North Ayrshire Council and South Ayrshire Council operational areas. The northern extent of the Ayrshire SMP is the town of Skelmorlie on the Ayrshire coast whilst the southern extent of the Ayrshire SMP is the Galloway Burn on the northern shore of Loch Ryan. The inland and offshore extents of the Ayrshire SMP will be within approximately 1km of the coastline. The Plan also includes the shorelines of Great Cumbrae and the Isle of Arran. Islands such as Little Cumbrae and Ailsa Craig are not included within the scope of the Plan owing to the absence of any permanent significant population which would be affected by coastal flood risk and/or erosion. The Ayrshire SMP will develop policies for management of the shoreline within these extents, which are illustrated in Figure 2.1

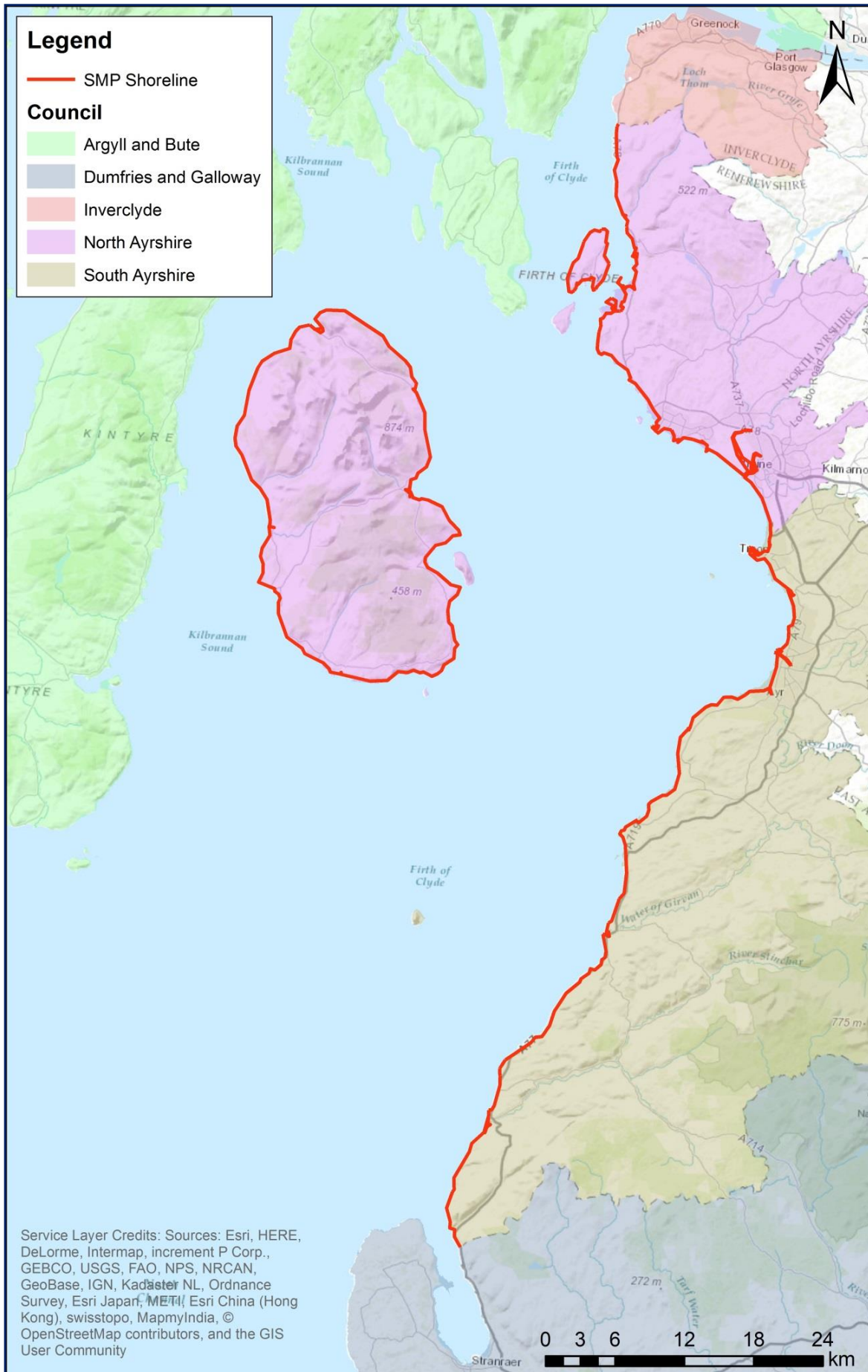


Figure 2.1 Proposed Shoreline Management Plan - Extent

2.3 OBJECTIVES

The general objectives of the Ayrshire SMP are as follows:

- Setting out the risks from flooding and erosion to people and the developed, historic and natural environment within the SMP area;
- Identifying opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion;
- Identifying the preferred policies for managing risks from floods and erosion over the next century;
- Identifying the consequences of putting the preferred policies into practice;
- Setting out procedures for monitoring how effective these policies are;
- Informing others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies;
- Discouraging inappropriate development in areas where the flood and erosion risks are high; and
- Ensuring compliance with international and national nature conservation legislation and aiming to achieve their biodiversity objectives.

The policies of the Ayrshire SMP to meet these objectives will be dependent upon the issues identified at various locations along the Ayrshire coastline. Such issues include the risk of flooding or coastal erosion to people, property and infrastructure. The objectives available to the Ayrshire SMP are summarised in **Table 2.1**.

Table 2.1 Summary of Ayrshire SMP Policies

Policy	Description
No Active Intervention / Do Nothing	No investment in coastal defences or operations and the shoreline is either allowed to remain in a natural state or to revert to a natural state.
Hold the Line	Maintaining or changing the standard of protection. In addition to covering situations where the existing defence structures need to be maintained, this policy also covers those situations where work or operations are carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on) to improve or maintain the standard of protection provided by the existing defence line. This policy also

	includes other policies that involve operations to the rear of existing defences (such as building secondary floodwalls) where they form an essential part of maintaining the current coastal defence system.
Advance the Line	Allows for building new defences on the seaward side of the original defences. Use of this policy is generally limited to those policy units where significant land reclamation is considered likely / desirable. It should be noted that setting this policy for a section of shoreline does not represent a requirement that actions must be taken to advance the defence line, rather it indicates that these actions are considered acceptable, however it is important to consider that actions which will hold the existing defence line are also acceptable.
Managed Realignment	Represents a policy of allowing the shoreline to move backwards or forwards, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).

It is not an objective of the Ayrshire SMP to develop detailed designs for individual shoreline management measures; however outline options and scenarios to meet the proposed objectives will be identified and assessed.

3 METHODOLOGY AND CONSULTATIONS

This SEA Environmental Report has been produced to assess the environmental impacts of the measures proposed as part of the Ayrshire SMP. It has further been produced so as to provide environmental guidance to ensure that the Plan is more sustainable. In conjunction with this, a Plan level AA has also been prepared to inform the decision making process, in terms of the potential for the proposed measures to impact upon the integrity of any European sites in view of their conservation objectives. Both environmental assessments have been central to the development of the draft Plan.

3.1 METHODOLOGY

The proposed measures have been assessed in terms of their potential positive and negative impacts and the significance of these impacts on the environment against the SEA objectives. The purpose of this is to predict and evaluate, as far as possible, the environmental effects of the Plan, highlighting any significant environmental problems and / or benefits that are likely to arise from the implementation of the Plan. Where possible, this assessment has been quantitative, with a graphical output to aid public appreciation and understanding of the implications of each proposed measure in the Plan.

The Ayrshire SMP has been assessed via a Baseline Led Assessment. This method involves the assessment of each option available in the enactment of the Ayrshire SMP against each of the following headings/subjects:

- Biodiversity, Flora & Fauna (BFF)
- Population & Human Health (PHH)
- Geology, Soils and Landuse (S)
- Water (W)
- Climatic Factors (C)
- Material Assets & Infrastructure (MA)
- Cultural, Architectural & Archaeological Heritage (H)
- Landscape & Visual Amenity (L)

Each alternative available in the Ayrshire SMP has been assessed in the short, medium and long term for likely effects, the significance of the effects, and whether they are positive or negative effects. Other impacts that have been assessed for significance are; secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects. The

scenario of “The Evolution of the Environment without the Ayrshire SMP” has also been assessed in the same format. This is considered the Do-Nothing Scenario.

The proposed scenarios for consideration have been assessed in the SEA against the Strategic Environmental Objectives (SEOs) to examine the likely significant environmental impacts of the Ayrshire SMP. All potential positive and negative impacts will be presented individually, with a text description, and then a summary graphic. In addition, a summary of the overall balanced potential effect will be presented for each environmental issue area.

The scores assigned to impacts will range from + 3 to -3, as demonstrated in **Table 3.1**. The purpose of adding numerical scores is to assist in the ranking of options and for the potential incorporation of the environmental and social criteria into future decision making by the Ayrshire SMP team, as this can provide for a multi-criteria analysis of alternatives if desired. Options may have both positive and negative impacts at the same time.

Table 3.1 Description of SEA Environmental Impact Scores

Score	Description
+ 3	Significant positive environmental impacts
+ 2	Moderate positive environmental impacts
+ 1	Slight positive environmental impacts
0	No environmental impacts
- 1	Slight negative environmental impacts
- 2	Moderate negative environmental impacts
- 3	Significant negative environmental impacts

3.2 SEA OBJECTIVES

The Strategic Environmental Objectives (SEOs) were developed and consulted on with the environmental consultees. This assessment is relatively strategic, with the aim of reporting likely impacts at the coastal cell and sub-cell level to reflect the scale at which the options are being planned. The SEA Objectives, Sub-Objectives, Indicators and Targets used are given in **Table 3.2**.

Table 3.2 Strategic Environmental Objectives

Criteria	Objective	Sub-Objective	Indicators	Minimum Requirement	Aspirational Target
Biodiversity, Flora & Fauna	1 Avoid damage to, and where possible enhance, the biodiversity, flora and fauna in the vicinity of the shoreline.	A Avoid detrimental effects to, and where possible enhance, International and European designations for protected species and their key habitats.	Areas of SAC, SPA, WHS and Ramsar designation. Numbers of protected species.	No loss of area of or negative impacts on International and European sites and protected species.	Potential enhancement of and increased protection for International and European sites and protected species.
		B Avoid damage to or loss of, and where possible enhance, national and local nature conservation sites and protected species, or other know species of conservation concern.	Areas of SSSI, LNRs, MCAs and local conservation designations. Numbers of protected species.	No loss of area of or negative impacts on national and local conservation sites and species.	Potential enhancement of and increased protection for national and local conservation sites and species.
Population & Human Health	2 Protect the public from risk of flooding and coastal erosion.	A Protect the public from risk of flooding and coastal erosion.	Population at risk of flooding and erosion.	No increase in population at risk of flooding and erosion.	No population at risk of flooding and erosion.
Geology, Soils and Landuse	3 Maintain or improve areas of existing functional soil and land resource.	A Maintain or improve areas of existing functional soil and land resource.	Areas of functional soil and land resource at risk of flooding and erosion.	Minimise the loss of functional soil and land resource, where not in conflict with natural processes.	Improvement of functional soil and land resource, where not in conflict with natural processes.
Water	4 Protect and enhance the state of the water environment.	A Protect and enhance the state of the water environment.	Coastal morphology and waterbody status.	No deterioration of status of coastal and transitional waterbodies.	Contribute to the improvement of status of coastal and transitional waterbodies.
Climatic Factors	5 Adaptation to potential climatic change.	A Adaptation of shoreline management to potential climatic change.	Interaction with potential climate change influenced flood extents / wave overtopping and severe weather events.	SMP actions to demonstrate adaptability to climatic change.	SMP actions to be planned for climatic change.

Criteria	Objective	Sub-Objective	Indicators	Minimum Requirement	Aspirational Target
Material Assets & Infrastructure	6 Protect material assets and infrastructure from risk of flooding and coastal erosion.	A Protect material assets and infrastructure from risk of flooding and coastal erosion.	Material assets and infrastructure at risk from flooding and erosion.	No increase in material assets and infrastructure at risk of flooding and erosion.	No material assets and infrastructure at risk of flooding and erosion.
Cultural, Architectural & Archaeological Heritage	7 Protect or enhance historic environment features and their settings.	A Avoid loss of, or damage to, heritage features.	International, National and local designated heritage structures, sites and monuments.	No loss or damage to heritage features, or their setting, from construction and operation of proposed measures.	Increased protection / preservation for heritage features and improvement of setting.
		B Minimise effects on the setting of heritage features.			
Landscape & Visual Amenity	8 Protect, and where possible enhance the landscape character and visual amenity of the Ayrshire shoreline.	A Protect, and where possible enhance the landscape character and visual amenity of the Ayrshire shoreline.	Landscape character assessments. Designated landscapes and views.	No significant negative impacts on landscape quality and amenity of the Ayrshire shoreline.	Enhancement of the landscape and visual amenity of the Ayrshire shoreline.

3.3 COMPATIBILITY OF OBJECTIVES

The compatibility of the Plan objectives with those of the SEA is demonstrated in **Table 3.3** below.

Table 3.3 Compatibility of Objectives

Plan Objective	Compatible SEOs
Setting out the risks from flooding and erosion to people and the developed, historic and natural environment within the SMP area	<ul style="list-style-type: none"> Population & Human Health Geology, Soils and Landuse Material Assets & Infrastructure Cultural, Architectural & Archaeological Heritage
Identifying opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion	<ul style="list-style-type: none"> Biodiversity, Flora & Fauna Geology, Soils and Landuse Water Landscape & Visual Amenity
Identifying the preferred policies for managing risks from floods and erosion over the next century	<ul style="list-style-type: none"> Population & Human Health Geology, Soils and Landuse Material Assets & Infrastructure Cultural, Architectural & Archaeological Heritage
Identifying the consequences of putting the preferred policies into practice	<ul style="list-style-type: none"> Population & Human Health Geology, Soils and Landuse Material Assets & Infrastructure
Setting out procedures for monitoring how effective these policies are	<ul style="list-style-type: none"> All
Informing others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies	<ul style="list-style-type: none"> Population & Human Health Geology, Soils and Landuse Material Assets & Infrastructure
Discouraging inappropriate development in areas where the flood and erosion risks are high	<ul style="list-style-type: none"> Population & Human Health Geology, Soils and Landuse Material Assets & Infrastructure
Ensuring compliance with international and national nature conservation legislation and aiming to achieve the biodiversity objectives	<ul style="list-style-type: none"> Biodiversity, Flora & Fauna Geology, Soils and Landuse Water Landscape & Visual Amenity

3.4 CONSULTATIONS

An SEA Scoping Report for the Plan was circulated on the 6th September 2016 to the following statutory consultees:

- Scottish Environment Protection Agency

- Scottish Natural Heritage
- Historic Environment Scotland

The Scoping Report was also made publically available via the North Ayrshire Council and South Ayrshire Council websites. The detailed responses received in the SEA Scoping consultations can be found in **Appendix C** of this SEA Environmental Report. All responses received from this consultation have been incorporated into the environmental assessments where feasible.

In addition to the scoping consultations, a stakeholder consultation report was produced in May 2017 to provide early engagement with non-statutory stakeholders from the Ayrshire coastline who may have an interest in the study. These stakeholders contacted with the report were:

- Firth of Clyde Forum
- Scottish Water
- Royal Society for the Protection of Birds
- Transport Scotland
- EDF Energy (Hunterston)
- Largs Golf Club
- Routenburn Golf Club
- West Kilbride Golf Course
- Auchendarvie Golf Course
- Irvine Bogside Golf Club
- Gables Link
- Western Gables Golf Club
- Dundonald Links
- Kilmarnock (Barassie) Golf Club
- Troon Yacht Havens
- Prestwick St Cuthbert
- Dalmling Golf Club
- Seafeld Golf Course
- Belle isle Golf Club
- Trump Turnberry Ailsa
- Girvan Golf Course
- Brodick Golf Club
- Futurescape
- Ayrshire River Trust
- Community of Arran Seabed Trust
- Darley Golf Course
- Fullarton Golf Course
- Lochgreen Golf Course
- Royal Troon Golf Club
- Prestwick Golf Club
- Prestwick St Nicholas Golf Club

The detailed responses received from this early stakeholder consultation can be found in **Appendix D** of this SEA Environmental Report and have been taken into consideration in the development of the Plan where feasible. The next stage of engagement with these stakeholders will be on the draft Plan.

3.4.1 Proposed Consultation on Draft Plan and SEA Environmental Report

Consultation on the draft Plan, SEA Environmental Report and the Habitats Regulation Appraisal will commence in January 2018 and run for 12 weeks. The consultation activities will take the form of Public Consultation Days and potentially Elected Member briefings. The documents made available at the North Ayrshire Council and South Ayrshire Council premises and available digitally via their websites.

Description of the Plan

3.5 INTRODUCTION

Table 3.4 below sets out the proposed elements of the Plan and identifies those to be assessed as part of the SEA and why. This information is provided to generate discussion during the consultation process and is subject to change based on the comments received.

Table 3.4 Proposed Elements of the Plan to be Assessed

	Draft Plan Section	Will this be <u>assessed</u> in the SEA?
1	Introduction to the Ayrshire SMP, its definition, purpose, structure, principles and objectives.	No – This provides factual information about the background to the Ayrshire SMP. However, the Plan's Strategic Objectives will be assessed within the environmental report to test its compatibility and completeness against the SEA Objectives.
2	Strategic Environmental Assessment , why it was undertaken and what was done in the SEA process.	No – This is a statement about the environmental assessments undertaken for the Ayrshire SMP. This should however include guarantees that the Plan will comply with recommendations from the environmental assessments.
3	Basis for Development of the Ayrshire SMP	No – This provides factual information about the baseline of the Ayrshire shoreline. This baseline information will however inform the environmental baseline in the SEA.
4	Options for Shoreline Management following assessment	No – This is general information on the options available for shoreline management.
5	Policy Statements	Yes – These are policies proposed for each policy unit within a coastal sub-cell and for the whole Ayrshire SMP area. These policies are to meet the Ayrshire SMP objectives. Policies should be selected following environmental assessment in the SEA and

	Draft Plan Section	Will this be <u>assessed</u> in the SEA?
		HRA.
6	Action Plan relating to the management activities proposed for the Ayrshire shoreline.	Yes – This is the proposed action plan of the policies proposed. This action planning should be influenced by the environmental assessment in the SEA and HRA.
7	Mitigation and Monitoring.	No – These are mitigation and monitoring proposals recommended by the SEA and AA, which should be incorporated into the Ayrshire SMP and implemented in future implementation of the Ayrshire SMP.
8	Next Steps. Details how the Ayrshire SMP will be implemented in relation to spatial planning and proposes further action to facilitate medium and long term planning.	No – This is a statement about future implementation and management of the Ayrshire SMP.

3.6 GEOGRAPHIC SCOPE

The Ayrshire SMP covers the Ayrshire shoreline from the northern boundary of North Ayrshire Council at Skelmorlie, to the southern limit of South Ayrshire Council at the Galloway Burn on the north eastern edge of Loch Ryan. It also includes the shorelines of Great Cumbrae and the Isle of Arran. Islands such as Little Cumbrae and Ailsa Craig are not included within the scope of the Plan owing to the absence of any permanent significant population which would be affected by coastal flood risk and/or erosion. As part of the technical development of the Ayrshire SMP, coastal process modelling of the shoreline was undertaken to determine sediment movement patterns and identify appropriate coastal sub-cells. Eleven coastal cells for the Scottish coastline were originally identified by H R Wallingford in 1997 in a study for Scottish Natural Heritage. These coastal cells were identified on the basis that sediment movement between cells is relatively limited i.e. the sediment dynamics of each cell is relatively independent of that of adjoining cells. The coastal process modelling completed for the Ayrshire SMP has enabled the coastal sub-cells to be further sub-divided. These sub-cell boundaries were defined by points across which there is limited sediment movement potential even during storm conditions. The boundary locations of the 15 sub-cells identified for the Ayrshire coast are shown in **Figure 3.1** and defined in **Table 3.5**. The original coastal cell numbering convention adopted by Scottish Natural Heritage was maintained, with further divisions within an existing sub-cell defined by appending a number to the existing cell name e.g. 6b1, 6b2 etc. The definition of these coastal sub-cells is critical in terms of the development of a sustainable SMP for the Ayrshire coast, as these sub-

cells define the areas within which various measures can be applied without affecting adjoining sections of the coast. Thus, the sub-cells will define the geographic boundaries for future studies associated with the detailed design of a wide range of coastal management measures with potential to impact on coastal sediment dynamics.

Table 3.5 Coastal Sub-Cell Extents

Sub-cell	Extents
6b1	Cloch Point – Hunterston Ore Terminal
6b2	Hunterston Ore Terminal – Farland Head
6c1	Farland Head – Ardrossan
6c2	Ardrossan – Troon
6c3	Troon – Ayr
6c4	Ayr - Dunure
6c5	Dunure - Turnberry
6c6	Turnberry – Bennane Head
6d1	Bennane Head – Currarie Port
6d2	Currarie Port – Milleur Point
A1	Lochranza – Clauchlands Point
A2	Clauchlands Point – Kingscross Point
A3	Kingscross Point – Drumadoon Point
A4	Drumadoon Point – Lochranza
Great Cumbrae	Great Cumbrae

None of the sub-cells identified as part of the analysis for the Ayrshire SMP interact with the shoreline within the Argyll and Bute Council area. Sub-cell 6b1, located between Cloch Point and Hunterston Ore Terminal, extends north of the North Ayrshire Council area to include part of the Inverclyde Council area. Objectives for shoreline management of this sub-cell will therefore need to be prepared in coordination with Inverclyde Council.

The shoreline of sub-cell 6d2, is composed mainly of rock to the south of Currarie Port as far as Cairnryan, with no significant sediment movement. Softer sediments are present within Loch Ryan, to the South of Cairnryan, however this is within the Dumfries and Galloway Council area and therefore outside of the scope of the Ayrshire SMP. It should be noted that Dumfries and Galloway are understood to be scoping a shoreline management plan at the time of writing.

The SEA study area cannot be defined as a fixed extent and may extend beyond the limits of the North and South Ayrshire Council areas where necessary, dependent on the potential for impacts on the wider environment. Given that the coastal process modelling has indicated that any modification to the shoreline should only have impacts within the coastal sub-cells it is anticipated that the majority of effects and assessment will remain within the North and South Ayrshire Council areas. With that being said the potential for impacts on the wider environment, such as to migratory species still remains, and will be assessed on a case by case basis. Thus, the assessment boundary will extend as far as necessary from the Ayrshire coastline, dependent on potential impacts. The study extent for the HRA of the Ayrshire SMP is likely to also extend beyond the limits of the Ayrshire SMP so that the potential for impacts on European sites can be fully assessed under the Habitats Directive. A summary of the findings of the HRA will be incorporated into the SEA Environmental Report.

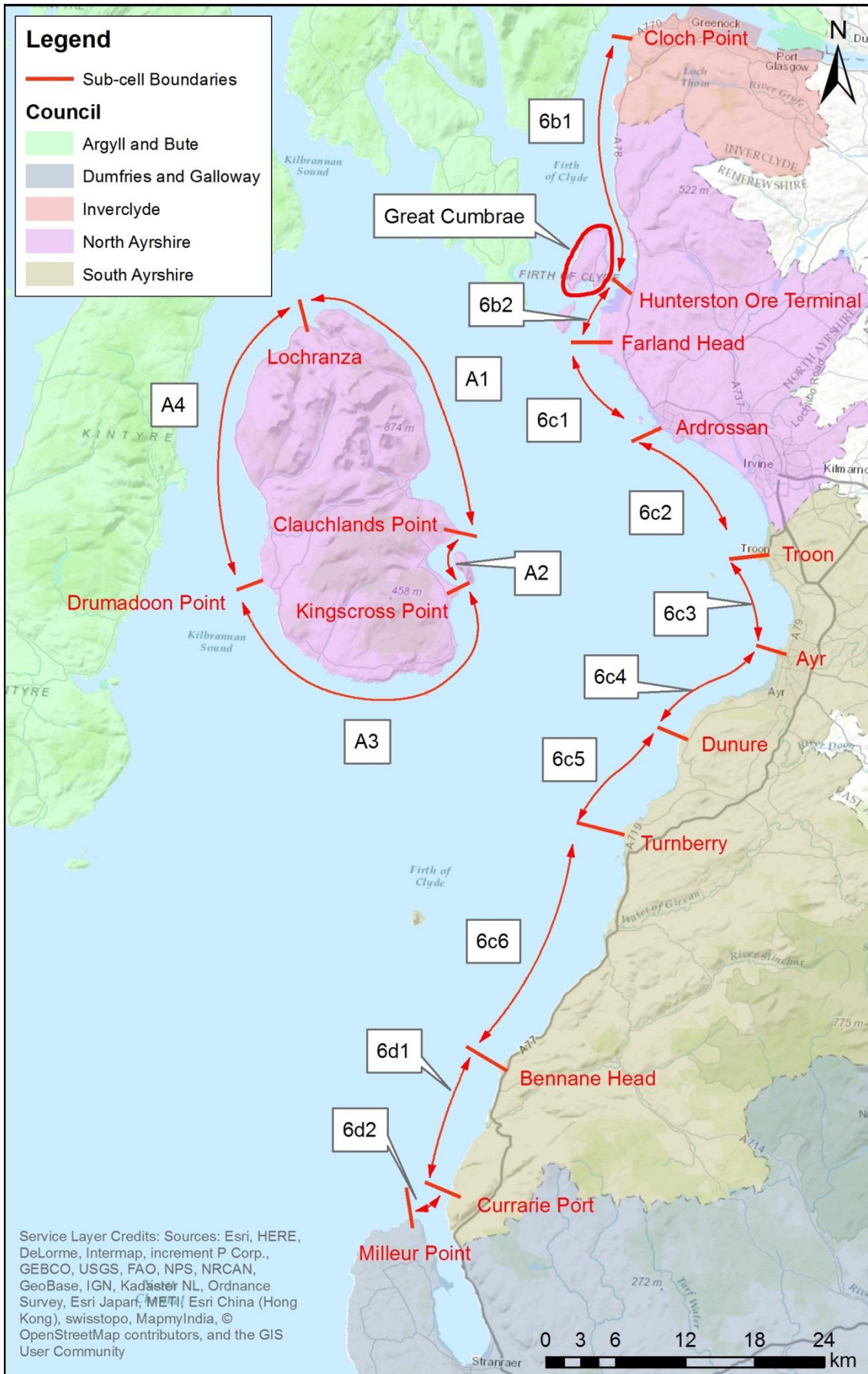


Figure 3.1 Coastal sub-cell boundaries for the Ayrshire and Arran coastlines

3.7 TEMPORAL SCOPE

The Ayrshire SMP is likely to cover the period from 2017 to 2117, split into 3 epochs of short term 0 - 25 years, medium term 25 – 50 years and long term 50 – 100 years. The Ayrshire SMP will be reviewed periodically for updates and to monitor progress and impacts. In line with the SEA Directive; short, medium and long-term impacts (including reference to secondary, cumulative, synergistic, permanent and temporary, positive or negative effects) will be considered during the environmental assessments of the Ayrshire SMP. Within the assessment, the short, medium and long term may have a slightly different definition than the Ayrshire SMP timescales. The short term defines the construction/implementation of a shoreline management action, the medium term will be the immediate operational years (e.g. 0 – 10 years) following the construction/implementation of a shoreline management action, while the long term will be the long term operation of a shoreline management action (e.g. 10 years onwards). The SEA takes this different temporal scope to demonstrate the potential impact of an action from its construction/implementation, through operation to the medium and long term of the SMP.

4 BASELINE AND RELEVANT ENVIRONMENTAL ISSUES

4.1 INTRODUCTION

Included in the following section is a discussion of the environmental baseline for the Plan area. The baseline has been divided by topic into the issues requiring assessment under the SEA legislation. The purpose of the following section is to demonstrate the level of baseline environmental information used in the assessment of the potential impacts of the SMP policies and actions. This baseline information will form the indicators which the policies will have the potential to impact upon. Future variations in these indicators due to the Plan will be monitored as part of the Plan and SEA review. Unless otherwise stated, the environmental issues discussed in the following section are generally transected by or within 1km of the coastal sub-cells.

4.2 BIODIVERSITY, FLORA & FAUNA

There are a wide variety of protected natural habitats within the overall Plan area. There are 10 Special Areas of Conservation (SAC) within 15km of the Ayrshire shoreline. These are designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species, and include the likes of Bankhead Moss, the Lendalfoot Hills Complex and Tarbert Woods. Special Protection Areas (SPAs) are designated under The EU Directive on the Conservation of Wild Birds (EC/79/409), as amended by Directive 2009/147/EC. "The Birds Directive" identifies areas that are important for rare and vulnerable bird species as they use them for breeding, feeding, wintering or migration. There are seven SPAs within 15km of the Ayrshire shoreline. These include the likes of Renfrewshire Heights, Alisa Craig and Arran Moors. Together these European sites form part of the Natura 2000 Network. Any development with the potential to impact upon a Natura 2000 designated site (SACs or SPAs) is likely to require an Appropriate Assessment (AA) under the Habitats Directive 92/43/EEC. These sites are protected by the Habitats Regulations 1994 (as amended in Scotland).

Under the Convention on Wetlands of International Importance especially as Waterfowl Habitat, Contracting Parties are required to designate suitable wetlands within their territory for inclusion on a List of Wetlands of International Importance. Within the Plan area, there is one such designated 'Ramsar' site (Loch of Inch and Torrs Warren) located in Dumfries and Galloway. This is outside of the scope of the Ayrshire SMP. The European Sites within the vicinity of the Ayrshire shoreline are shown in **Figure 4.1**.

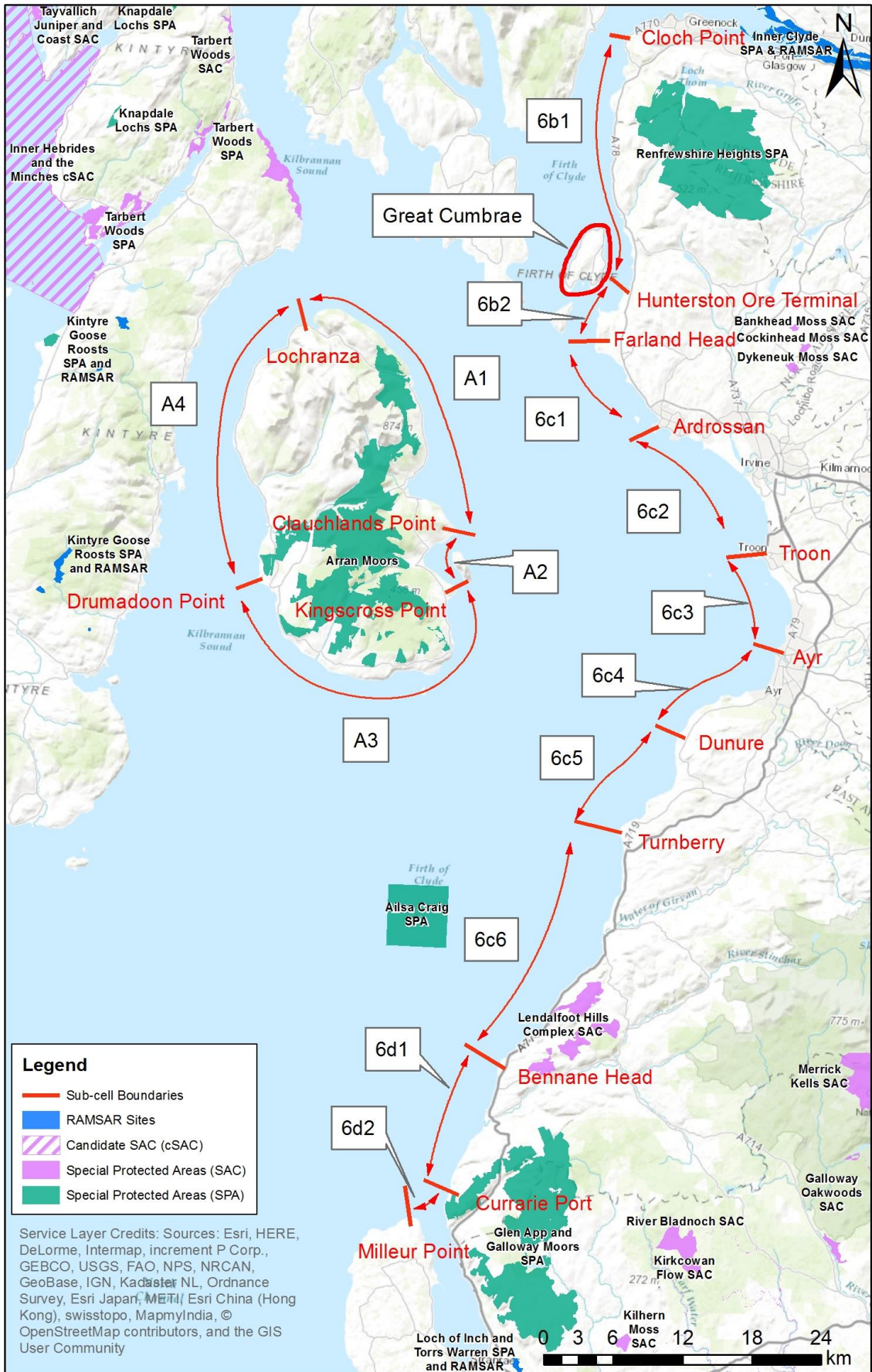


Figure 4.1 European sites within the vicinity of the Ayrshire shoreline

Sites of Special Scientific Interest (SSSI) are protected under the Nature Conservation (Scotland) Act 2004. These are areas of land and water which SNH considers to best represent Scotland's natural heritage – its diversity of plants, animals and habitats, rocks and landforms, or a combination of such natural features. There are a large number of SSSI within the Plan area. These include the likes of the Portencross Woods, Milleur Point and Arran Northern Mountains.

Marine Protected Areas are designated under the Marine (Scotland) Act 2010 and the UK Marine and Coastal Access Act for the purpose of protecting Scotland's marine wildlife, habitats, geology and undersea landforms. The South Arran MPA is the only MPA within this Plan area. Marine Consultation Areas (MCAs) are identified by SNH as deserving particular distinction in respect of the quality and sensitivity of the marine environment within them. There are two MCAs within the Plan area; these are Loch Ryan and the Cumbraes.

There are also three Local Nature Reserves (LNRs) in the vicinity of the Ayrshire shoreline. These are sites which have been declared under the Countryside Act 1949. They are managed for conservation purposes and provide opportunities for research and education as well as public enjoyment. The SSSIs within the vicinity of the Ayrshire shoreline are shown in **Figure 4.2** whilst LNRs, MCAs and MPAs within the vicinity of the Ayrshire shoreline are shown in **Figure 4.3**.

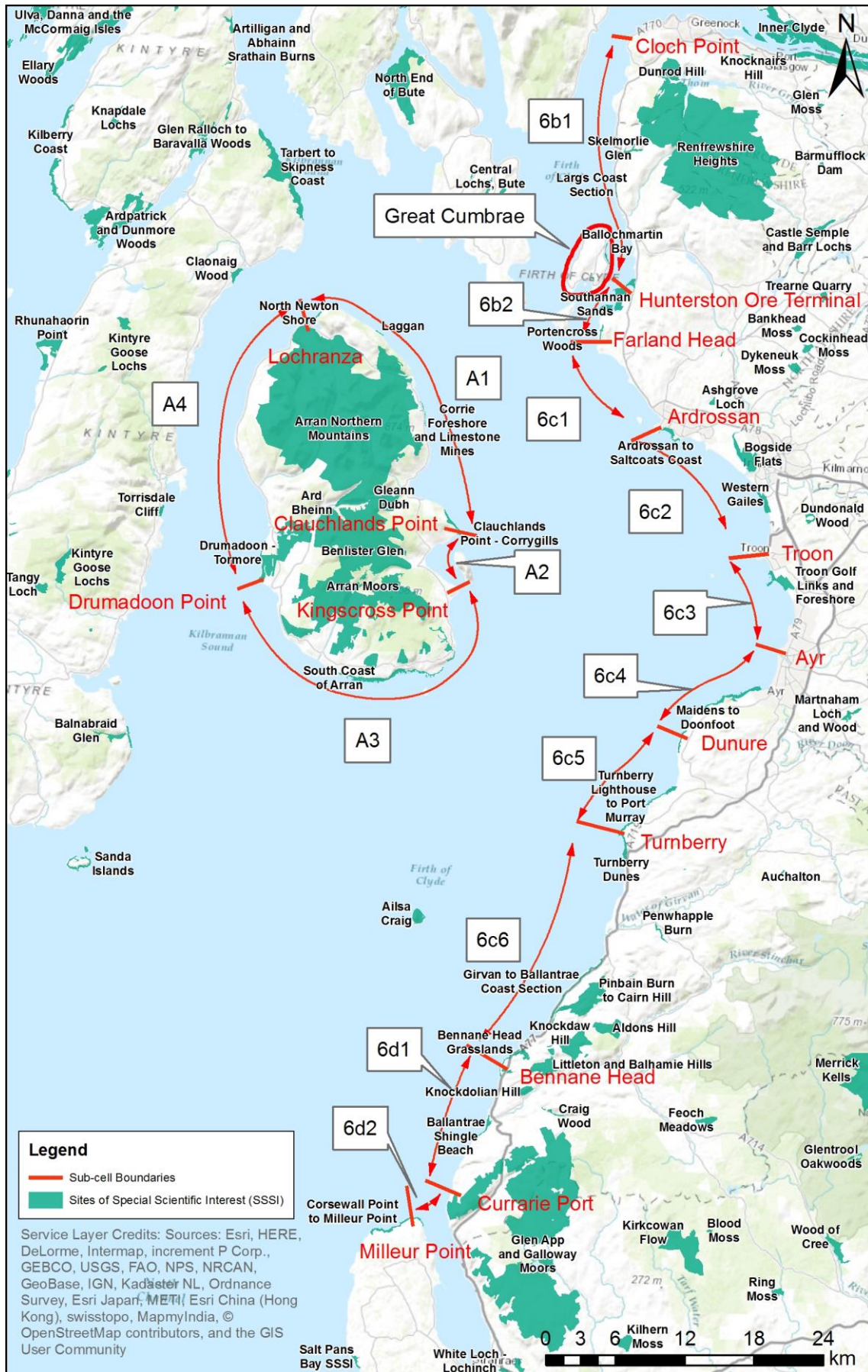


Figure 4.2 SSSIs within the vicinity of the Ayrshire shoreline

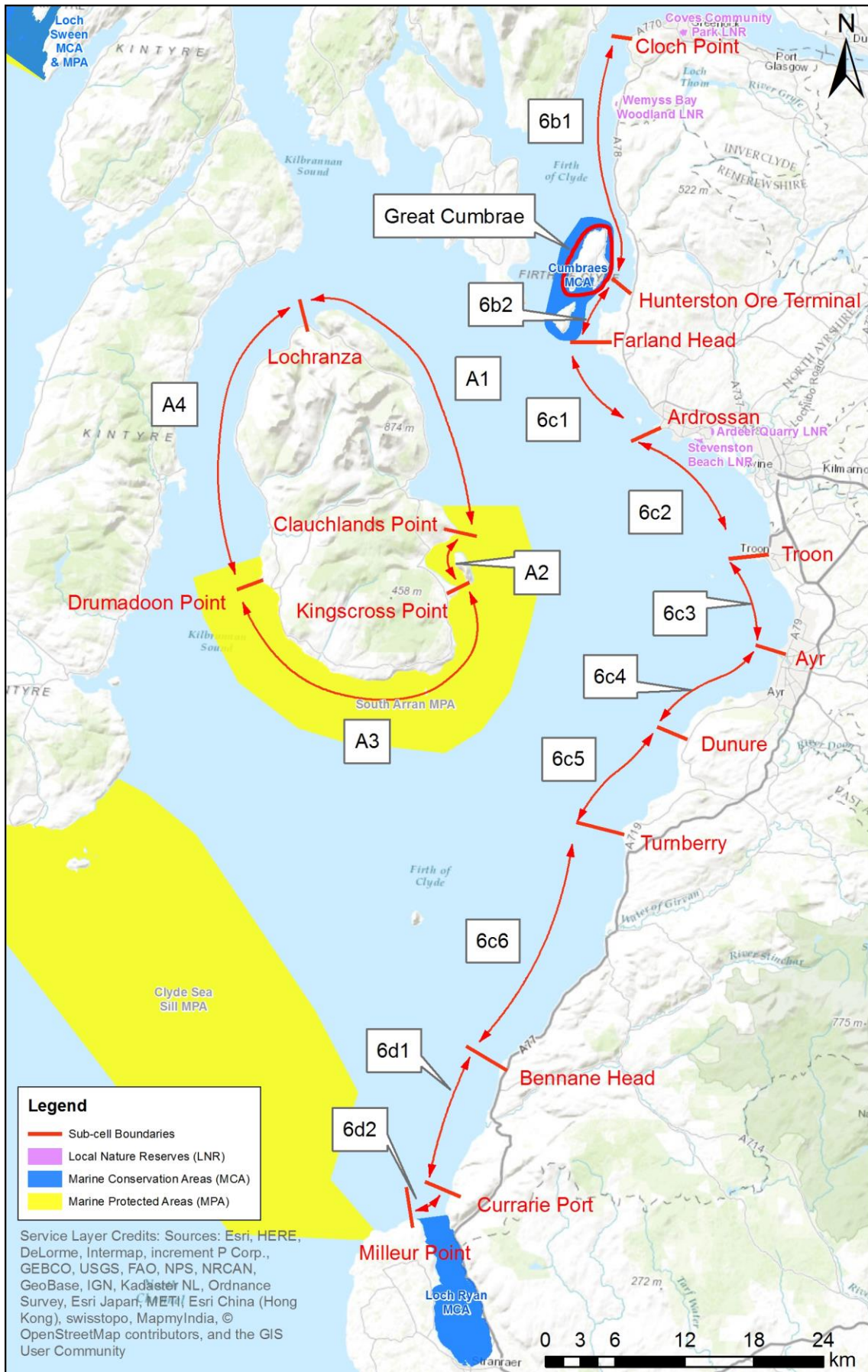


Figure 4.3 LNRs, MCAs and MPAs within the vicinity of the Ayrshire shoreline.

In addition to these designated areas there are also a wide variety of valued species within the Plan area. Fish species such as sole, anglerfish, blue whiting and cod are common along the Ayrshire coast; as are haddock, hake, herring and a variety of mackerel species. This region also hosts populations of cetaceans, such as harbour porpoise, minke whale and various dolphin species; as well as populations of sharks and rays.

Seal haul-outs are designated by Scottish Ministers under the Marine (Scotland) Act 2010. These are locations on land where seals come ashore to rest, moult or breed. There are two haul-out sites within the Plan area; in Kildonan and on Lady Isle.

Non-native, invasive species could be a threat to the native flora and fauna in the area. Non-native brown alga *Sargassum* was first found in Scotland in 2004 in Loch Ryan; it has since spread up the west coast of Scotland and is present within several of the sub-cells within the Plan area.

Where active management and construction is proposed as a means of managing the Ayrshire shoreline it is likely that there will be resultant interference with natural coastal processes and a loss of local habitats and their dependant species due to direct and indirect construction impacts and coastal squeeze. However, the adoption of the SMP can also provide the opportunity for habitat creation and enhancement, along with increasing public awareness of local biodiversity, flora and fauna issues, which could give greater protection and appreciation in the long term.

4.3 POPULATION & HUMAN HEALTH

The census undertaken in 2011 found there to be approximately 138,150 people living within North Ayrshire. This represents a population increase of 1.7% since 2001. Of this number 17.7% are below the age of 16 with a further 18.7% being over 65 years old. These figures are broadly similar to those of South Ayrshire where, according to the 2011 census, approximately 112,800 people live; 0.6% more than in 2001. The proportion of this population that are young inhabitants (below 16 years of age) within this area is relatively low at approximately 16.3%, whilst the proportion of inhabitants over 65 years old is relatively high at 21.5%. The elderly and the very young would be considered to be of higher vulnerability from flood risk.

When considering the entirety of the Ayrshire coastline, the northern aspect of the region is more densely populated comparative to that of the south. Residents along the coast are predominantly concentrated within settlements such as Largs, Ardrossan, Irvine, Troon, Ayr and Girvan. On the Isle of Arran, the majority of the local population resides within coastal valley settlements such as Brodick and Lamlash on the east of the island.

The health of the population of Ayrshire is not dissimilar to that of the nation's health. In North Ayrshire, the average age of the population, at 42 years old, is slightly higher than the national average. Of this population, 79% consider their health to be either 'good' or 'very good'. In South Ayrshire, the average age of the population is 44 years old. Of this population 81% consider their health to be either 'good' or 'very good'; just slightly below the national average of 82%.

The risk to people of coastal flooding is present within all sub-cells within the scope of the SMP. With that being said, the extent to which such risk is present varies significantly. For example, there is no risk to properties from coastal flooding within policy area A2.3 (Lamlash to Kingscross). Conversely, there is significant risk to properties from coastal flooding within policy areas such as 6B1.2 (Largs to Hunterston Ore Terminal) and 6C3.1 (Troon to Ayr). In the 200 year scenario there are approximately 1,080 residential properties at risk of coastal flooding within the scope of the SMP. The average number of persons per household within both North and South Ayrshire is approximately 2.2. Given this information, it can be estimated that approximately 2,380 people within Ayrshire are at risk from coastal flooding from a 1: 200 year event. This differs from the number of people at risk of coastal erosion in this area, insofar as there are no residential properties which are directly at risk of coastal erosion within the Plan area and therefore no persons believed to be directly at risk from coastal erosion. With that being said, coastal erosion is not all together absent from the Plan area, as such does take place within the vicinity of a small number of residential properties.

Where active management and construction is proposed as a means of managing the Ayrshire shoreline it is likely that associated construction activities may lead to short term disturbances to local communities. However the implementation of measures to regulate water flow and reduce flood risk will serve to protect human health. Sustainable management of the coastline can also lead to greater recreational potential, which in turn can provide health benefits to the local population.

4.4 GEOLOGY, SOILS & LANDUSE

Within those sub-cells which are found on the mainland, the soil is largely made up of brown soils with some regosols, alluvial soils and mineral gleys. On the Isle of Arran, the soil is largely comprised of mineral gleys with some brown soils. Often, these are derived of raised beach sand and gravel, old red sandstone and arenaceous/metamorphosed argillaceous schists which overlie the strong and gentle slopes of the uplands, lowlands and raised beaches which characterise the local landscape.

Coastal farmland within the Study Area is largely classified as being 'Land capable of supporting Arable Agriculture', 'Land capable of supporting Mixed Agriculture' and 'Land capable of supporting Improved Grassland'. To the south of the Study Area, the Western Southern Uplands Environmentally Sensitive Area (ESA) has been identified and designated 'for the purpose of conserving, protecting and enhancing environmental features of the area by the maintenance or adoption of particular agricultural methods'¹.

The coastal bedrock geology of the area is, for the most part, made up of interbedded sandstone and conglomerate with breccia, siltstone and mudstone also. The seabed is largely comprised of deep circalittoral mud, sponge communities and deep circalittoral rock, and both deep and shallow circalittoral coarse sediment.

¹ <http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=19046&id=19048>

The coastal hinterland within the study area has a wide variety of uses including industry, retail, housing and leisure tourism.

Where the continuation of natural coastal process is deemed to be the most viable and sustainable option available to the Plan, it is unlikely that there will be any form of significant impact upon local geology, soil and/or land use, apart from the natural erosion / accretion processes. Where active management or construction is preferred in the Plan, coastal morphology and sediment dynamics may be impacted upon.

4.5 WATER

The EU Water Framework Directive (WFD) (2000/60/EC) established a new legal framework for the protection, improvement and sustainable use of rivers, lochs, transitional waters, coastal waters and groundwater across Europe. This was undertaken in order to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution. As a result of this legislation, the Ayrshire coastline is split up into River Basin Districts (RBD): the Scottish RBD and the Solway Tweed RBD.

Making up these RBDs are a number of coastal and transitional waterbodies, along with other waterbodies, including the Ayr Bay Coastal Waterbody and the Girvan Estuary Coastal Waterbody. For the most part, coastal waterbodies within Ayrshire have an overall status of Good or Moderate. Transitional waterbodies within Ayrshire are largely given an overall status of Good, however some transitional waterbodies, the Ayr and Girvan Estuaries in particular, have been awarded an ecological status of Bad or Poor.

The Designated Bathing Waters within Ayrshire mainly have an overall status of Poor, with the exception of the Troon (South Beach) Bathing Water which has an overall status of Good.

The risk of coastal flooding is present throughout the Plan area (in the majority of sub-cells); as is the risk of coastal erosion and/or accretion. The rate of erosion and accretion, where present, varies throughout the sub-cells. Coastal flood risk within the SMP and in the Environmental Report has been established from the SEPA Indicative Flood Maps from the first cycle Flood risk Management Plans in Scotland.

Actions from the SMP have the potential for indirect impacts on coastal and transitional waterbodies from sedimentation and release of contaminants in runoff from construction activities. Actions from the SMP are unlikely to cause or exacerbate flood risk or erosion, and are proposed to manage these issues; however it is important that the Plan ensures that it is not transferring risk onto other receptors.

4.6 CLIMATE

The climate of Western Scotland is relatively mild with its annual mean temperature of around 9.7°C. This is due, in part, to the strong maritime influence of the prevailing winds which come in from across

the sea. The Ayrshire coast is exposed to such winds and has between five and 25 days of gale force winds each year.

Annual average rainfall within Ayrshire is estimated to be less than 1000mm along the coast. Autumn and winter, and October and January in particular, are the wettest seasons of each year, during which time Ayrshire experiences approximately 45 wet days and fewer than five days of snow. The spring and summer months, particularly from April to June, are the driest months of the year, with May and June being the sunniest. The average annual sunshine total along the Ayrshire coast is approximately 135 hours.

In 2016, the annual mean summer temperature in Ayrshire was 13.6°C. The Met Office anticipates that this figure is likely to increase by approximately 2.5°C by 2050 as determined by the published medium emissions scenario. The annual mean winter temperature in Ayrshire in 2016 was 4.5°C. This is expected to increase by 1.1°C under the same scenario. In line with this, it is anticipated that precipitation will increase during the winter months and decrease during the summer months by 1% in both instances.

With regard to the Ayrshire marine environment, the annual mean near-bed temperature between West Kilbride and Dunure is 9.59°C. Between Dunure and Stranraer (including the Isle of Arran) the annual mean near bed temperature is 9.64°C. It is anticipated that sea bed temperatures will have risen by approximately 2 to 2.5°C by 2085. Sea surface temperature throughout the study area is approximately 9.85°C. This too is predicted to rise by between 2 and 2.5°C by 2085.

Medium scenario estimates of relative sea-level change with respect to Millport, Great Cumbrae, suggest that sea levels will rise by approximately 12.4cm by 2050 and by 28cm by 2095.

Waves which approach the Ayrshire shoreline are mostly generated across the fetch of the north Irish Sea and the Firth of Clyde, with south to westerly directions being the most common. With that being said, westerly long period swell waves from the North Atlantic can also propagate towards the southern extent of the Ayrshire shoreline (sub-cells 6D1 and 6D2) through the North Channel. Wave transformation modelling was carried out as part of the Ayrshire SMP and the maximum significant wave height (H_m0) incident on the Ayrshire shoreline during a force 8 storm was estimated to be approximately 2.0m, with the largest waves occurring between Ardrossan and Currarie Port.

4.7 MATERIAL ASSETS

Development along the Ayrshire coastline varies between rural areas of low density development and built up urban settlements. Such settlements are connected by a variety of transport routes including roads, such as the A77 and the A841, which run along the Ayrshire coastline. These roads are accompanied by several active railway lines which also run in close proximity to the mainland shoreline. These include the Ayrshire Coast Line which connects Ayrshire coastal settlements, such as Largs, Ardrossan and Ayr, to Glasgow Central. Harbours can be found situated in the likes of Ardrossan, Brodick, Largs, and Troon.

Sub-sea infrastructure such as power and telecommunications cables, both active and residual, are situated within many of the Plan area's sub-cells. These work so as to connect the Isle of Arran (and Holy Isle), Great Cumbrae and Northern Ireland to the Scottish mainland.

On the mainland and on the Isle of Arran also, there are a number of Industrial Emissions Directive (IED) Sites. These are concerned with a variety of sectors including the food and beverage sector, the chemical industry, and paper and wood production and processing; to give just a few examples. There is also a variety of energy-related infrastructure along the Ayrshire coastline; the likes of which include a number of onshore windfarms, hydropower stations, the Caledonian Paper Mill biomass plant and the Hunterston power station sites.

The risk to material assets of coastal flooding is present within all sub-cells within the scope of the SMP. With that being said, the extent to which such risk is present varies significantly. For example, there is no risk to material assets of coastal flooding within policy area 6B1.1 (Skelmorlie to Largs). Conversely, there is significant risk to material assets of coastal flooding within policy areas such as 6C2.3 (Irvine Bay to Gales Bay). In the 200 year scenario there are approximately 576 non-residential properties at risk of coastal flooding and a risk of A roads, B roads and minor roads which amounts to a total cost of £274,924.00 in damages. The risk presented to non-residential properties by coastal erosion in the 200 year scenario is minimal as no non-residential properties are affected directly by coastal erosion. With that being said, a small number of properties are within the zone of influence (10m) and/or within the vicinity (60m) of coastal erosion and may therefore be subject to its affects to some small extent.

Where active management and construction is proposed as the preferred policy, it will need to be planned appropriately at the detailed design phase in order to work with existing and proposed material assets.

4.8 CULTURAL, ARCHAEOLOGICAL & ARCHITECTURAL HERITAGE

There are a large number of cultural, archaeological and architectural heritage features within the Plan area. These include the 1,784 listed buildings, the 117 scheduled monuments and the 21 Conservation Areas situated throughout many of the area's sub-cells. There are also 21 designated gardens and landscapes within the area; many of which are lands associated with historic assets such as Brodick Castle or Culzean Castle. Features such as Culzean Castle are also designated National Trust of Scotland Sites; of which there are many within the Plan area. There are also multiple Canmore Sites such as Arran High School and Greenan Castle to name just a few. Coastal built heritage can also be found here in all sub-cells.

Within the waters of the Plan area there are a large number of vessels which are presumed to have been lost. There are also a number of wrecks, such as the HMS/M Vandal, which have been found along the coastline.

Construction of shoreline management activities as a result of the Plan may have short to long term impacts upon historic environment assets and their setting.

4.9 LANDSCAPE & VISUAL AMENITY

The mainland aspect of the study area is largely defined by its raised beaches and coastal lowland. The use of these areas of land varies but they are often farmed; producing some of the more productive agricultural land in Ayrshire. The steep escarpment of the beaches is invariably clothed in rich, broadleaf woodland with dramatically wind sheared canopies.

Compared with surrounding areas, the northern aspect of the mainland coast is heavily populated; with many of the local settlements having expanded beyond their original sites. They often now take the form of ribbon settlements along coastal roads which has the effect of extending the influence of the urban area thereby weakening the distinctive character of the raised beach landscape.

The landscape on the Isle of Arran and Great Cumbrae is defined by its lowland fringe which incorporates areas of raised beach which broaden where valleys reach the coast. Such valleys provide a focus for larger settlements such as Brodick, Lamlash and Millport whilst the raised areas are characterised by narrow, linear villages such as Corrie and Pirmill.

The contraction of the farming industry along the Arran coastline is evident in the abandonment of higher enclosures, the presence of outgrown beech hedges or their replacement with post and wire fences. The Forestry Commission holds the deeds to a number of wooded areas along the Arran coastline.²

Designated landscapes within Ayrshire include North Arran, the North Ayrshire Hills, most of the mainland coastal margin, the principal river valleys, the Heads of Ayr and much of south west Carrick³.

Any construction activity which may be the result of the Ayrshire SMP has the potential for temporary, negative impacts upon landscape and visual amenity. The implementation of policies and actions to manage the shoreline may have short to long term, negative effects by way of disrupting the setting and view of the coast.

4.10 EVOLUTION OF THE ENVIRONMENT IN THE ABSENCE OF THE PLAN

In the absence of the Plan i.e. the Do-Nothing Scenario, the Ayrshire shoreline will remain managed with the existing measures and current maintenance practices. The shoreline management will not be planned in a forward thinking, integrated and holistic manner, which could make it ill-adapted for the anticipated impacts of climatic change.

² Land Use Consultants. (1998) Ayrshire Landscape Assessment. Perth. Scottish Natural Heritage. Available online at: <http://www.snh.org.uk/pdfs/publications/review/111.pdf>. Last Accessed: 15/08/2017

³ Land Use Consultants. (1998) Ayrshire Landscape Assessment. Perth. Scottish Natural Heritage. Available online at: <http://www.snh.org.uk/pdfs/publications/review/111.pdf>. Last Accessed: 15/08/2017

The local biodiversity, flora and fauna, is likely to remain as the status quo in areas of agricultural development, as the species present are kept in check by the farming practices of the land. The semi-natural and natural land areas of the Plan area are likely to either be taken over by agriculture or human development at some point or another, or to go through the natural succession procedure whereby the flora and fauna assemblages will alter over time until dominant stable conditions are achieved. In net terms there is likely to be a loss of local biodiversity, flora and fauna, with agriculture or urban/rural development being the most probable outcomes for much of the area. With regard to marine biodiversity, flora and fauna, it is likely to remain the same; altering only due to climatic change over time or as a result of national and/or international legislation affecting the marine environment and/or dependant industries.

Population levels within the area are likely to remain stable in the short term future, with, for the most part, slightly greater net migration taking place into South Ayrshire than North Ayrshire⁴. In both instances, trends suggest that those aged 16 to 29 are the most likely to migrate both in and out of North and South Ayrshire. Not implementing the SMP is unlikely to have a significant impact upon migration within the Ayrshire region, however may impact the geographical distribution of the population along the coastline, as the population is forced to live further from the coast due to the risk of flooding and erosion. In general, population levels locally, nationally and internationally are anticipated to rise.

There is unlikely to be significant changes to geology, soil and land use in the Plan area in the future. There may be pockets of improvement of soil and land for agricultural purposes, and therefore loss of more natural land, and also the loss of natural and agricultural lands due to urban creep; however these would not be due to the absence of the Plan. Without the Plan there is not the potential for the protection of existing soil and land resources from flooding and erosion. In the long term this is likely to lead to the loss of usable soil resources due to salt water inundation, and the loss of land for development due to coastal flood risk and erosion.

Water quality in the region is likely to improve in the future with the introduction and improvement of European water legislation such as The Water Framework Directive (WFD). Under this existing legislation, the water status objectives for the majority of coastal waterbodies within the Plan area are to be restored to Good by 2027. The water status objectives for the majority of transitional waterbodies within the Plan area are to be restored to Good or High by 2027. Not implementing the SMP is unlikely to affect this trend.

⁴ National Records of Scotland (2016) North Ayrshire Council Area – Demographic Factsheet. [Online] [Accessed 17 August 2017]. Available at: <https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/north-ayrshire-factsheet.pdf>

National Records of Scotland (2016) South Ayrshire Council Area – Demographic Factsheet. [Online] [Accessed 17 August 2017]. Available at: <https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/south-ayrshire-factsheet.pdf>

With the introduction of new flood protection legislation, such as the EU Floods Directive, and subsequent flood risk management plans, future flood risk should be better managed, however only if the Plans are implemented. The aim of the EU Flood Directive is to reduce and manage the risks that floods pose to human health, the environment, infrastructure and property. The SMP is developing and implementing the flood risk management proposals for the Ayrshire coastline and therefore without the Plan the people, property and infrastructure along the Ayrshire coast will remain at risk of flooding. This future flood risk is likely to be exacerbated by climate change impacts and by increasing development and settlement along the coastline, if it is not guided and managed by a shoreline management plan.

Water resource and supply for household and business purposes in the area would rely on available existing supply capability and infrastructure. With future population growth and development pressure there will be additional demands on the local water supply system within the study area. This will need to be further developed. The absence of the Plan is unlikely to have any significant impacts on this water supply and resource in the future; however any existing or future water resource infrastructure along the Ayrshire coastline which is at risk of flooding and/or erosion will remain at risk and will not be managed for future risk.

Current climate change predictions anticipate sea level rises, changes in rainfall patterns and temperatures, as well as changes in the frequency of droughts and extreme weather events. The absence of the Plan reduced the capacity for effective and sustainable management of the many impacts of climate change and thus is likely to result in a situation whereby there is a higher degree of risk associated with these factors.

Infrastructure and material asset maintenance and development along the Ayrshire coastline are likely to continue in reaction to the requirements of the growing population. In the absence of the Plan the infrastructure and material assets may remain at risk of significant flood events, climate change exacerbated flooding and future coastal erosion. A lack of management and preparedness for this risk could have significant implications on these assets, causing significant damages and disruption. Also without the SMP the future planning and development of infrastructure and material assets may happen with no knowledge of the flooding and erosion risks along parts of the coastline.

In the future the heritage features associated with the Ayrshire coast will continue to degrade and may be lost to nature or to development if not designated and protected. Where heritages features are at risk of erosion or flooding there is the potential for their accelerated loss if the shoreline is not sustainably managed. In the absence of the Plan there is a higher risk of loss or damage to these features and their settings.

In the absence of the Plan, the landscape value of the area is unlikely to change significantly. It is probable that development, particularly around the main urban settlements, will continue to take place in efforts to generate and sustain investment within the area. Development is likely however to be pushed back from the coastline in the absence of the Plan, as the future flood risk is not managed. Erosion and accretion will continue to shape the coastal landscape to a considerable extent.

5 REVIEW OF RELEVANT, PLANS, PROGRAMMES AND POLICIES

5.1 INTERACTION WITH OTHER RELEVANT PLANS AND PROGRAMMES

As part of the SEA process, the context of the Plan must be established with regard to other Plans and Programmes that have been adopted at International, European and National levels. In particular, the interaction of the SMP with the environmental protection objectives and standards included within these Plans and Programmes requires consideration.

Table 5.1 identifies the main significant environmental plans, programmes and legislation, adopted at international, European Community or Member State level, which would be expected to influence, or be influenced by, the Plan. While it is recognised that there are many Plans, Programmes and legislation that could relate to the Plan it is considered appropriate to only deal with those significant texts so as to keep the assessment at a strategic level. More information on these Plans, Programmes and legislation, along with their potential interaction with the Plan is given in **Appendix E**.

Table 5.1 Summary of Key Plans and Programmes Relevant to the Ayrshire SMP

Level	Plan / Programme
EU Level	<ul style="list-style-type: none"> • Birds Directive [2009/147/EC] • Bonn Convention [L210, 19/07/1982 (1983)] • Convention of Wetlands of International Importance especially as Waterfowl Habitat (1971) [UN Treaty Series No. 14583] • EIA Directive [85/337/EEC] [2014/52/EU] • Environmental Liability Directive [2004/35/EC] • Environmental Quality Standards Directive [2008/105/EC] • EU Biodiversity Strategy to 2020 [COM(2011)244] • EU Floods Directive [2007/60/EC] • EU Marine Strategy Framework Directive [2008/56/EC] • European Landscape Convention [ETS No. 176] • EU Thematic Strategy for Soil Protection [COM(2012) 46] • Habitats Directive [92/43/EEC] • SEA Directive [2001/42/EC] • Water Framework Directive [2000/60/EC] • World Heritage Convention [WHC-2005/WS/02]
National Level	<ul style="list-style-type: none"> • A Guide to Managing Coastal Erosion in Beach/Dune Systems 2000 • Climate Change (Scotland) Act 2009 • Equally Well 2008 • Good Places, Better Health: A New Approach to Environment and Health in Scotland, 2008 • Flood Risk Management (Scotland) Act 2009 • Historic Environment Scotland, Policy Statement 2016 • Land Use Strategy 2016-2021

Level	Plan / Programme
	<ul style="list-style-type: none"> • Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027 • National Marine Plan 2015 • National Planning Framework 2015 • Natural Flood Management Handbook, 2015 • Our Place in Time: The historic environment strategy for Scotland 2014 • Planning Advice Notes and Circulars • Scotland's Biodiversity: It's in your hands 2004 • Scotland's Climate Change Adaptation Framework 2009 • Scottish Planning Policy, 2014 • The Environmental Impact Assessment (Scotland) Regulations 1999 • The Environmental Impact Assessment (Scotland) Act 2005 • The Wildlife and Natural Environment (Scotland) Act 2011 • The Nature Conservation (Scotland) Act 2004 • The Habitats Regulations 1994 • The Marine (Scotland) Act 2010 • The Planning etc. (Scotland) Act 2006 • The Land Reform (Scotland) Bill 2015 • The Scottish Soil Framework 2009 • The Climate Change (Annual Targets) (Scotland) Order 2010 • The River Basin Management Plan for Scotland River Basin, 2015 -2027 • The 2020 Challenge • The Nature Conservation Act 2004 • Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) • Water Environment and Water Services (Scotland) Act 2003
Regional Level	<ul style="list-style-type: none"> • Ayrshire Flood Risk Management Plan, 2016 • Ayrshire Local Flood Risk Management Plan 2009 • Draft Ayrshire Shoreline Management Plan
Sub-Regional	<ul style="list-style-type: none"> • South Ayrshire Council, Supplementary Guidance: Historic Environment 2017 • North Ayrshire Council Local Development Plan 2014 • South Ayrshire Council Local Development Plan 2014 • South Ayrshire Town Centre and Retail Local Development Plan 2017 • Local Biodiversity Action Plan for North Ayrshire 2015-2018 • Draft Local Biodiversity Action Plan for North Ayrshire 2015-2018 • Ayrshire Biodiversity Action Plan: The Conservation and Enhancement of Ayrshire's Biodiversity 2007-2010 • North Ayrshire Environmental Sustainability and Climate Change Strategy 2017-2017

6 PROPOSED MANAGEMENT POLICIES / ACTIONS

6.1 DEVELOPMENT OF SHORELINE MANAGEMENT POLICIES

The Plan and environmental teams for the Ayrshire SMP held Objectives workshops with North Ayrshire Council and South Ayrshire Council in December 2016. These workshops were to agree the proposed management policy for each coastal sub-cell based on the known or anticipated risks of coastal flooding and coastal erosion, along with the existing and proposed development pressures and sensitivities along the coastline. As discussed in **Section 2.3**, these policies were either:

- No Active Intervention / Do Nothing;
- Hold the Line;
- Advance the Line, or
- Managed Realignment.

As there could be several policies, asset owners and administrative boundaries within the one coastal sub-cell, these areas were split down into smaller discrete areas called policy units. The policy units defined following these workshops are shown in **Figure 6.1** and summarised in **Table 6.1**. Each policy unit is assigned its own policy for future management of the shoreline. In total there were 32 policy units defined across 15 sub-cells. Each policy unit is being assessed individually and also cumulatively as part of a coastal sub-cell.

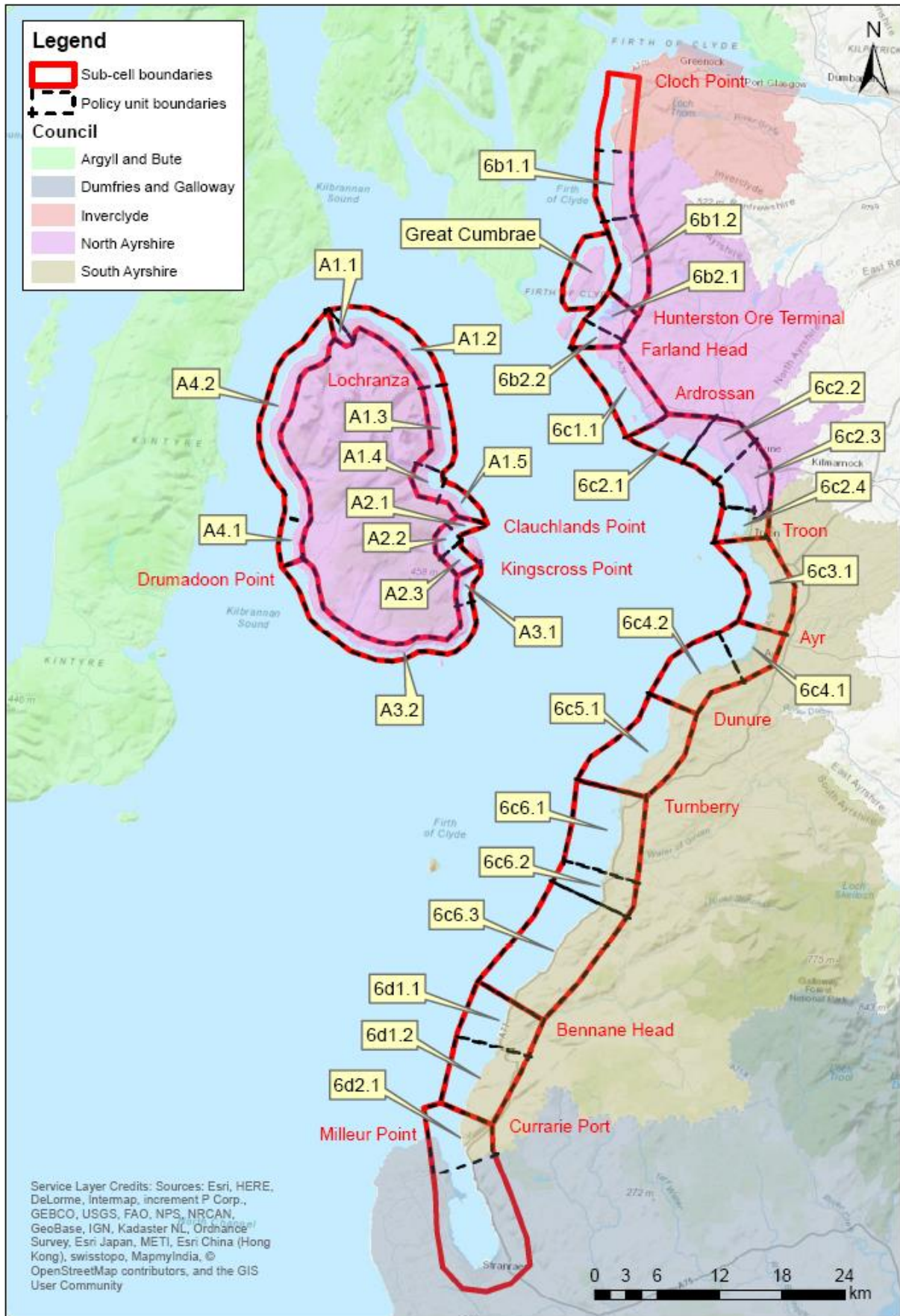


Figure 6.1: Ayrshire SMP Policy Units

Table 6.1 Ayrshire SMP Policy Units and Policy

Coastal Sub-Cell	Policy Unit	Policy
6B1 - Cloch Point - Hunterston Ore Terminal	6B1.1 - Skelmorlie to Largs	Hold the line
	6B1.2 - Largs and Fairlie	Hold the line
6B2 – Hunterston Ore Terminal – Farland Head	6B2.1 - Hunterston	Advance the line
	6B2.2 – Hunterston to Farland Head	Hold the line
6C1 – Farland Head - Ardrossan	6C1.1 – Farland Head to Ardrossan	Hold the line
6C2 – Ardrossan – Troon	6C2.1 – Ardrossan to Stevenston	Hold the line
	6C2.2 – Stevenston to Irvine Bay	Hold the line
	6C2.3 – Irvine Bay to Gales Burn	Hold the line
	6C2.4 – Gales Burn to Troon	Hold the line
6C3 – Troon – Ayr	6C3.1 – Troon to Ayr	Hold the line
6C4 – Ayr - Dunure	6C4.1 – Ayr to Greenan Castle	Hold the line
	6C4.2 – Greenan Castle to Dunure	No active intervention
6C5 – Dunure - Turnberry	6C5.1 – Dunure to Turnberry	No active intervention
6C6 – Turnberry – Bennane Head	6C6.1 – Turnberry to Girvan	No active intervention
	6C6.2 – Girvan	Hold the line
	6C6.3 – South Girvan to Bennane Head	Hold the line / Managed Realignment
6D1 – Bennane Head – Currarie Point	6D1.1 – Bennane Head to Ballantrae	Hold the line / Managed Realignment

	6D1.2 – South Ballantrae to Currarie Port	No active intervention
6D2 – Currarie Port – Milleur Point	6D2.1 – Currarie Port to Milleur Point	No active intervention
A1 – Lochranza – Clauchlands Point	A1.1 - Lochranza	Hold the line
	A1.2 – Lochranza to Sannox	No active intervention
	A1.3 – Sannox to Brodick	Hold the line / Managed Realignment
	A1.4 – Brodick	Hold the line
	A1.5 – Brodick to Clauchlands Point	No active intervention
A2 – Claughlands Point – Kingscross Point	A2.1 – Clauchlands Point to Lamlash	No active intervention
	A2.2 – Lamlash	Hold the line
	A2.3 – Lamlash to Kingscross Point	No active intervention
A3 – Kingscross Point – Drumadoon Point	A3.1 Whiting Bay	Hold the line
	A3.2 Largymore to Drumadoon Point	No active intervention
A4 – Drumadoon Point – Lochranza	A4.1 Drumadoon Point to Tormore	No active intervention
	A4.2 Machrie Bay to Lochranza	Hold the line/Managed Realignment
Great Cumbrae	Great Cumbrae	Hold the line / Managed Realignment

6.2 POTENTIAL ACTIONS TO ACHIEVE POLICIES

To achieve the proposed policies there may be actions required for future management of the shoreline. A long list of potential actions considered for shoreline management is presented in **Table**

6.2. These are the basic alternatives available to the SMP that were screened in Actions Workshops with North Ayrshire Council and South Ayrshire Council in July 2017. These workshops were to screen in and out the actions that may be technically and socially acceptable within the policy unit to meet the selected policy, based on the known or anticipated risks of coastal flooding and coastal erosion, along with the existing and proposed development pressures and sensitivities along the coastline.

Table 6.2 Long List of Potential Actions to Manage Shoreline

Action	Engineering Type	Description
Seawalls	Hard	These are typically of concrete, masonry or gabion construction. They are typically sloped but can also be near-vertical. The face can be smooth, stepped or curved. Seawalls protect against both erosion and flooding.
Revetments		A sloping structure with a facing of typically stone, concrete units or cobble. Revetments protect against erosion; however do not normally protect against flooding.
Embankments		A sloping sea defence structure of typically earthen/sand construction. These structures protect the coast from flooding; however they do not normally provide erosion protection.
Groynes	Mixed	These are normally straight structures perpendicular to the shoreline. They block part of the littoral drift and trap sand on their upstream side.
Detached breakwaters		These are straight shore-parallel structures which partly provide direct coastal protection as the shoreline in the lee of the structure is sheltered. Littoral transport in the lee of the structure is also reduced, trapping sand.
Headlands		These are smooth structures which extend out on the shoreface from the coastline. They block part of the littoral transport and have similar effects on the shoreline as groynes and detached breakwaters; however some of the disadvantages of groynes and detached breakwaters are minimised such as leeside erosion.
Perched beaches		These are natural or nourished beaches at locations with a steep shoreface where a submerged structure supports the lower part of the beach.
Cove		This is a semi-protected sandy bay. Two curved breakwaters which connect to the shore are used to form a cove.
Maintenance		In areas where coastal defences are currently in place, a maintenance regime can ensure that these structures continue to provide the required standard of protection.

Dune stabilisation	Soft	<p>Dunes are natural coastal feature formed by sand which blows inland from the beach and is deposited behind the coastline. Dunes act as a flexible buffer zone, moving backwards with an eroding coastline as long as there is space for this to occur. This process protects the hinterland from erosion and flooding. The ability of dunes to recover after a storm event can be affected if the dune vegetation is damaged. Planting marram grass and setting up spruce fascines or similar to trap sand can stabilise the dune encouraging accretion and build up. This needs to be carried out in a sensitive manner, as over-use of this technique may completely stabilise the dune, interrupting the natural cycle of dune initiation and sediment redistribution.</p>
Managed realignment		<p>In areas where significant coastal defence works have been undertaken, relaxing the requirements for fixing the coastline position to allow Managed Realignment may be feasible. If housing or infrastructure facilities are very close to the coastline this option will only be feasible if these can be abandoned or moved landward. Where Managed Realignment is implemented, the coast is given back to natural processes, thereby enhancing the environmental and recreational quality of the area. The rate of realignment can be managed by combining this measure with nourishment if required. If implemented successfully, Managed Realignment can be effective against both erosion and flooding.</p>
Nourishment		<p>This is a very natural way of combating erosion as sediment is added to artificially replace a deficit in the sediment budget. This measure does not remove the cause of erosion, so erosion will continue to occur along the nourished section, Continual maintenance is required as the nourished sand is gradually sacrificed. This measure generally does not prevent flooding, except in the case of dune nourishment which can offer additional flood protection.</p>
Breach drain		<p>In this system a drain is installed running parallel to the beach in the wave up-rush zone. The drain lowers the groundwater table in this localised area. This decreases the strength of the down-rush of the waves and increases the strength of the beach sand, thereby reducing erosion. This measure does not protect against flooding.</p>

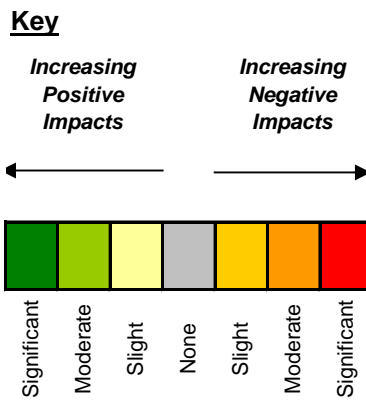
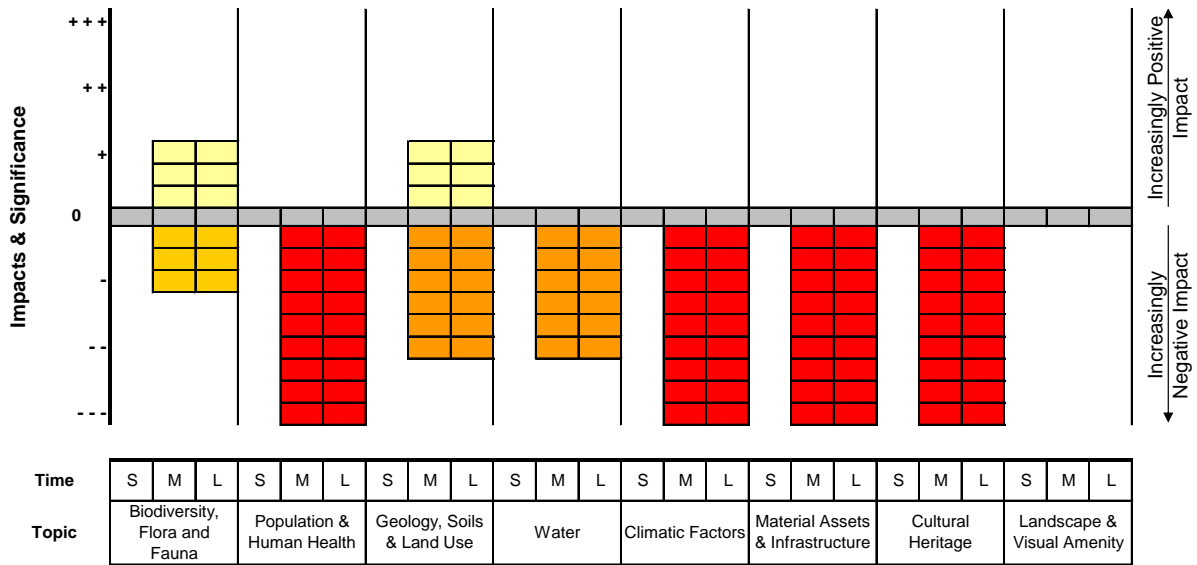
7 ASSESSMENT

The following section provides an assessment of the policies and potential actions proposed as part of the Ayrshire SMP for the sustainable management of the Ayrshire shoreline. The assessment uses the potential types of actions that may be implemented to meet the shoreline management policy and assesses them against the Strategic Environmental Objectives (SEO) provided in **Section 3.2**. A guide to the scorings used for this assessment is given in **Appendix F** of this report. Following the scoring of the proposed measures against these SEOs there is a wider commentary on the potential impacts by environmental topic area.

7.1 DO NOTHING

Sub-cell	All Ayrshire Coastline
Local Authorities	North Ayrshire Council and South Ayrshire Council
Sub-cell Information	
The northern boundary of the Plan area is the town of Skelmorlie on the Ayrshire coast. The southern boundary is the Galloway Burn on the northern shore of Loch Ryan. The far northern aspect of the Plan is situated within the Inverclyde Council area whilst the far southern aspect is within the Dumfries and Galloway Council area. There are 15 sub-cells within the Plan area.	
Key Plan Issues	
Risk to people, property and infrastructure from coastal flooding and erosion throughout the area.	
Key Environmental Issues	
The existing key environmental issues for the area of the Ayrshire Shoreline Management Plan can be found in Section 5 – Baseline and Relevant Environmental Issues .	

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	0	-1 / 1	-1 / 1
Population & Human Health (PHH)	0	-3	-3
Geology, Soils and Landuse (S)	0	-2 / 1	-2 / 1
Water (W)	0	-2	-2
Climatic Factors (C)	0	-3	-3
Material Assets & Infrastructure (MA)	0	-3	-3
Cultural, Architectural & Archaeological Heritage (H)	0	-3	-3
Landscape & Visual Amenity (L)	0	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - There are unlikely to be any significant positive or negative, short term impacts upon local biodiversity, flora and fauna as a result of not implementing the Ayrshire SMP. Biodiversity, flora and fauna will exist in the short term as it does now; kept in check by existing human activity. With that being said, there will be no form of shoreline management. Thus, in the medium to long term there is the potential for slight, negative impacts from localised species displacement and loss of habitats within flooded and eroded areas. In areas of accretion, the creation of new habitats may also occur, providing slight, positive impacts.

Population & Human Health - In the short term, there are unlikely to be any significant positive or negative impacts upon population and human health as a result of not implementing the Ayrshire SMP. In the medium and long term however, the risk presented to local populations by coastal flooding and erosion is likely to increase; in some cases to a significant extent. The total number of residential properties at risk within the Plan area for the 1:200 year event is over 940. Given that the average number of persons per household within both North and South Ayrshire is 2.2; this dictates that over 2,000 people are likely to be at risk from coastal flooding during a 5% AEP event. There would be the potential for significant negative impacts on population and human health from this risk of flooding and erosion.

Geology, Soils & Landuse - Not implementing the Ayrshire SMP is unlikely to have any positive or negative impacts upon geology in the short term. In the medium to long term however, local geology is likely to be subject to natural coastal erosion and accretion.

There are unlikely to be any short term impacts due to a lack of implementation of the SMP upon soil and landuse also. Nevertheless, in the medium and long term, the loss of land and usable soil resource as a result of coastal flooding and erosion is likely to occur. There is the potential for moderate negative impacts from increased loss of soil or land resource from coastal flooding and erosion in the medium to long term, however not impacting on natural coastal processes. There is also the potential for slight positive impacts from sediment gains in some areas from accretion in the medium and long term.

Water - Not implementing the Ayrshire SMP is unlikely to have any significant, direct, positive or negative impacts upon water quality, quantity or resource in the short, medium and long term. However, there are reported to be several areas of fill material, of unknown quality, along the Ayrshire shoreline that may be at risk of being mobilised into the coastal and transitional waterbodies as a result of erosion or storm events. With no management plan for the shoreline these areas may not be adequately protected into the future thereby putting the shoreline water quality at risk of moderate negative environmental impacts in the medium and long term.

Climatic Factors - Not implementing the Ayrshire SMP is unlikely to have any significant positive or negative impacts upon climatic factors; however the shoreline management will not be adaptable to climatic change, which could lead to significant negative environmental impacts from climate change exacerbated flooding and erosion.

Material Assets & Infrastructure - Not implementing the Ayrshire SMP is unlikely to have any significant positive or negative impacts upon material assets and infrastructure in the short term. In the medium and long term however, the risk presented to local assets and infrastructure by coastal flooding and erosion is likely to increase; in some cases to a significant extent. There are over 540 non-residential properties within North and South Ayrshire which are likely to be at risk of a 1:200 year coastal flood event if the SMP is not implemented. There is therefore the potential for significant negative impacts on material assets and infrastructure in the medium and long term.

Cultural, Architectural & Archaeological Heritage - Not implementing the Ayrshire SMP is unlikely to have any positive or negative impacts upon cultural, architectural and archaeological heritage features in the short term. In the medium and long term however, the risk presented to local heritage features by coastal flooding and erosion is likely to increase, in some cases to a significant extent, thereby dictating that known features may be lost, or may fall into disrepair. Unknown features will remain inaccessible to the public and are likely to remain unrestored and unpreserved. There is therefore the potential for significant negative impacts on cultural, architectural and archaeological heritage in the medium and long term from the loss or damage of features.

Landscape & Visual Amenity - Not implementing the Ayrshire SMP is unlikely to have any positive or negative impacts upon the landscape / seascape or visual amenity along the Ayrshire coastline in the short term, medium or long term. These are natural processes which have played their part in forming the landscapes/seascapes and views over time.

Potential sources of in-combination effects identified as part of this assessment include:

- Not implementing the Ayrshire SMP is unlikely to have any direct in-combination or cumulative impacts with other Plans or activities as there will be no new, planned shoreline management measures.

Key Conclusions:

Not implementing the SMP, the Do Nothing scenario, has the potential for medium and long term significant, negative impacts on population & human health, climatic factors, material assets and archaeological, architectural & cultural heritage. There is also the potential for moderate, negative impacts in the medium and long term on water quality and soils. These potential direct and indirect negative impacts are from the lack of coordinated and well planned protection of the shoreline from current and future predicted flood and erosion risk.

7.2 SUB-CELL 6B1

Sub-cell	6B1 - Cloch Point - Hunterston Ore Terminal
Local Authorities	North Ayrshire Council/Inverclyde Council
Sub-cell Information	
Sub-cell 6B1 extends from Cloch Point to Hunterston Ore Terminal. This sub-cell covers approximately 35km of shoreline, of which approximately 22km lie within the North Ayrshire Council area. The remainder of the shoreline in this sub-cell is located within Inverclyde Council area. There are two policy units within the sub-cell.	
6B1.1 – Skelmorlie to Largs – Hold the line.	

6B1.2 – Largs and Fairlie - Hold the line.

Key Plan Issues

6B1.1 - Transport Scotland asset (A78) at risk of coastal flooding.

6B1.2 - Significant coastal flood risk around the ferry terminal at Largs, the mouth of the Noddsdale Water and Allanton Park Terrace. There are other small pockets of coastal flood risk throughout the policy unit. A number of properties are also at risk due to erosion in the vicinity of Mackerston Place.

Key Environmental Issues

Biodiversity, Flora and Fauna – There are three SACs and two SPAs located in the vicinity of this sub-cell. Bankhead Moss SAC, Cockinhead Moss SAC and Dykeneuk Moss SAC are located inland from the coastline (all >5km) and are designated for the presence of raised bog habitats. The Inner Clyde SPA and Ramsar site (designated for the presence of non-breeding Redshank) is located along the coastline to the north of this sub-cell, at a distance of almost 15km at its closest point. Renfrewshire Heights SPA (designated for the presence of breeding hen harrier) is located immediately inland of the northern section of this sub-cell.

Four Sites of Special Scientific Interest (SSSIs) are located within or adjacent to this sub-cell. These are Largs Coast Section (designated for geological formations), Southannan Sands (designated for sandflats), Skelmorlie Glen (designated for upland mixed ash woodland) and Renfrewshire Heights (designated for breeding hen harrier).

The Wemyss Bay Woodland local nature reserve is situated within this sub-cell.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Two salmonid rivers are situated in this sub-cell, in the vicinity of Largs.

Population & Human Health – Within this sub-cell the areas of highest population density are Skelmorlie, Largs and Fairlie. In Skelmorlie (6B1.1), there are approximately 1990 residents at 20 people / hectare. In Largs (6B1.2), there are approximately 11,340 residents at 33 people / hectare. In Fairlie (6B1.2), the population is made up of about 1440 people at 19 people / hectare.

The coastal flood risk to people varies within this sub-cell. In policy unit 6B1.1 there is no risk to residential properties. In policy unit 6B1.2 there is significant risk to residential properties, with 249 residential properties (around 550 people) at risk of coastal flooding from the 1:200 year event. There are no persons or residential properties at risk due to coastal erosion.

In North Ayrshire, 49% of residents are considered to be in 'very good' health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in 'very bad' health, which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – The soil in policy unit 6B1.1 is largely comprised of blanket peats of organic parent material. For the most part, this overlies the strong and gentle slopes of the uplands and northern lowlands. In policy unit 6B1.2, brown soils derived from upper red sandstone overlie the lowlands with their strong and steep, slightly rocky, slopes. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Improved Grassland'.

The coastal bedrock is predominantly made up of interbedded sandstone and conglomerate whilst the seabed itself is comprised of deep circalittoral mud, sponge communities and deep circalittoral rock, and both deep and shallow circalittoral coarse sediment.

Developed land, and land within the coastal area, is largely divided between Fairlie, Largs and Skelmorlie where it is used for business, retail, housing and open space.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of 6B1 is made up of three Coastal Water Bodies, which are the Dunoon and Wemyss Bay, the Firth of Clyde Inner and the Largs Channel. The former and the latter of these have an overall status of Good with High confidence. They have Good ecological status and their overall chemical status is rated as Pass. The remaining waterbody, the Firth of Clyde Inner, has an overall status of Moderate with High Confidence. Its ecological status is of Moderate whilst its overall chemical status is a Pass.

Within this sub-cell, there is a risk of coastal flooding in Fairlie and at the Hunterston Ore Coal Terminal at Cloch Point. The risk of coastal erosion within this area is observed at Largs, whilst accretion is believed to take place at intervals between Skelmorlie Castle and the Pencil Monument.

Climatic Factors – There are over 400 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is almost 890 people; over 300 more people than are at risk from the current day 1:200 year event. There are also almost 140 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A78, the A770 and the A760. There are also 14 sections of standard track gauge and two railway tunnels which make up part of the Ayrshire Coast Line connecting coastal settlements such as Largs to Glasgow Central. At the sub-sea level, the BT-HIE Seg1.1 telecoms cable runs from Largs to Down Craig (Great Cumbrae) whilst residual sub-sea cable infrastructure is also present within this sub-cell. The Kelburn onshore wind farm is situated within 6B1.2; as is Largs Ferry Terminal, Largs Yacht Haven and Fairlie Quay Marina.

The risk of coastal flooding to material assets is present within this sub-cell. There are approximately 78 non-residential properties at risk from the 1:200 year coastal event. There is also risk to A roads, B roads and minor roads. There are no non-residential properties likely to be directly affected by coastal erosion within the sub-cell. With that being said, a small number of properties are within the vicinity (60m) of coastal erosion and may therefore be subject to its affects to some small extent. There are no roads directly affected by coastal erosion; however a small proportion of B roads and minor roads run within the influence and/or vicinity or such erosion.

Cultural, Architectural & Archaeological Heritage – Within this sub-cell there are a large number of heritage features including 158 listed buildings, eight scheduled monuments, two designated gardens and two Conservation Areas. There is only one Property in Care; the Skelmorlie Aisle and Largs Old Parish Church. There are also a number of Canmore Sites including the Shore Road Beach House Nursing Home, Skelmorlie Castle and Largs Harbour.

A number of vessels are presumed to have been lost within the vicinity of this sub-cell, along with a number of wrecks which have been found. A number of coastal built heritage features are also nearby; including the Widgeon and the Rose found in the Inner Clyde estuary.

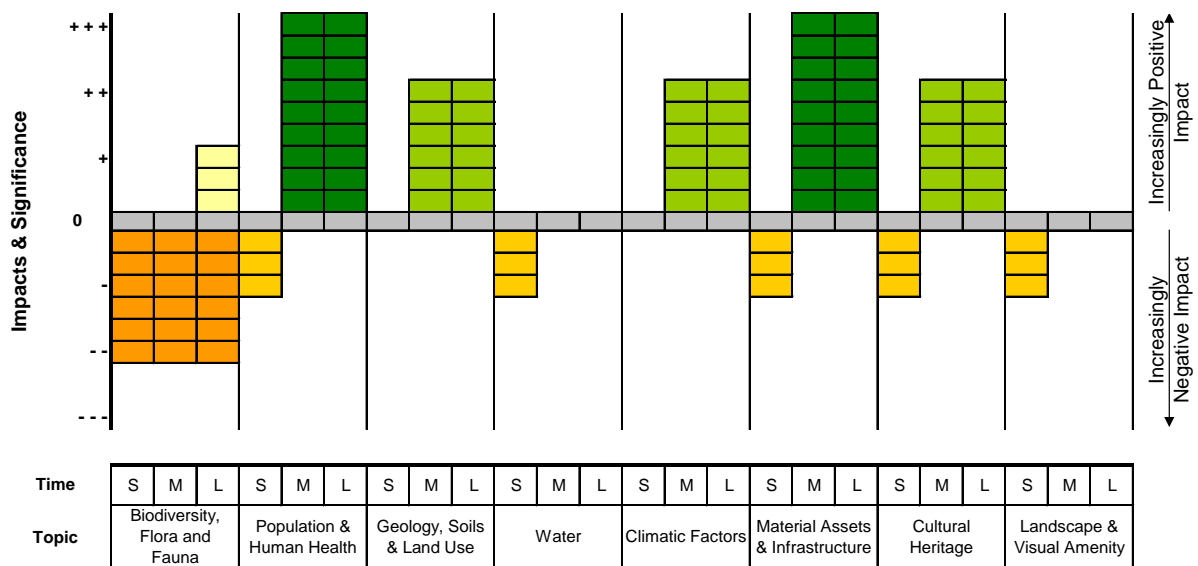
Landscape & Visual Amenity Baseline – This aspect of the Ayrshire coastline is defined by its raised beaches. These occur where areas of higher ground reach the shore but where changes in sea or land level have dictated that the land is elevated beyond the water's reaches. The result of this process is often a steep, sometimes craggy escarpment, representing the former cliff-line. For the most part, the raised beach has been carved into comparatively soft red sandstone. Amongst the most

dramatic of these are the steep hills situated near Largs in policy unit 6B1.2. This wall of hills forms an escarpment which provides a dramatic setting for Largs as well as designed landscapes such as Kelburn. These raised beaches vary in land use but are often farmed; producing some of the more productive agricultural land in Ayrshire. The steep escarpment of the beaches is invariably clothed in rich, broadleaf woodland with dramatically wind sheared canopies.

Local settlements such as Largs have expanded beyond their original sites and have spread along the narrow sections of raised beach. The buildings of these settlements reflect the geology of the region. This is the case in Largs, where tenement buildings and grander structures such as churches are composed of red sandstone. Despite the elevated nature of the raised cliff-line, tall structures such as masts are relatively few.

There are significant areas of greenspace situated near the coast within the vicinity of Largs. The Mainland Special Landscape Area is situated within this sub-cell, however is generally inland from the coastline.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-2	-2 / 1
Population & Human Health (PHH)	-1	3	3
Geology, Soils and Landuse (S)	0	2	2
Water (W)	-1	0	0
Climatic Factors (C)	0	2	2
Material Assets & Infrastructure (MA)	-1	3	3
Cultural, Architectural & Archaeological Heritage (H)	-1	2	2
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in this sub-cell has the potential for short to long term, moderate, negative impacts on a European site and for short term, slight, negative impacts on local habitats and species. In addition, there is potential for long term, slight, positive impacts on local habitats and species from habitat creation.

There is no potential for impacts on the three SACs designated for raised bog habitats (Bankhead Moss, Cockinhead Moss and Dykeneuk Moss), as there is no pathway by which impacts could occur on the designated raised bog habitats from implementation of shoreline management measures. Hen harrier, the designated species of Renfrewshire Heights SPA, will not be affected as they do not use intertidal or shoreline habitats and any shoreline management measures will be at a greater distance than the maximum indicated for disturbance of the species. There is some potential for short to long term, moderate, negative impacts on the Inner Clyde SPA and Ramsar site from construction or rehabilitation of hard defences, should protected Redshank populations of the SPA be utilising the area where these measures will be implemented. A previous wader and wildfowl survey of Portencross Coast SSSI by SNH in 2006 (now covered, in part, by Southannan Sands SSSI) indicated that Redshank populations were using this area. There is potential for short term construction-phase disturbance of this species, and potential for a long term loss of some intertidal habitat through coastal squeeze. It should be possible to mitigate for disturbance with good timing of works, and for coastal squeeze impacts with careful planning and design of shoreline protection measures.

No significant impacts are expected on Skelmorlie Glen SSSI (designated for upland mixed ash woodland), Renfrewshire Heights SSSI (designated for hen harrier), or Largs Coast Section (designated for the geological formation of intertidal rock exposure, with no encroachment currently anticipated to the site). Southannan Sands SSSI is designated for intertidal sandflats; there is potential for short to long term, moderate, negative impacts on this site from construction or rehabilitation of hard defences, including disturbance of species using the habitat and disturbance or damage to habitat such as dwarf eelgrass *Zostera noltei*. It should be possible to mitigate for any significant impacts with careful planning and good construction practice.

There is potential for short term, slight, negative impacts through a direct temporary local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long term, slight, positive impacts, through creation of habitat for local flora and fauna.

Population & Human Health - During the rehabilitation/construction phase of this proposed policy measure there is the potential for temporary, direct and indirect, slight, negative impacts upon local population and human health due to disturbance, such as from noise, vibration, pollution, dust and traffic etc. There is also the potential for these impacts to be re-occurring in the future due to maintenance works; however these re-occurring impacts are likely to be negligible. These disturbance impacts should be taken into account during detailed design and construction planning so as to prevent, reduce and as fully as possible offset all such impacts. Nevertheless, the result of such works is the medium and long term protection of local populations within policy unit 6B1.2. Approximately 250 residential properties would directly benefit from the implementation of this policy in the sub-cell, which equates to almost 550 people. This would provide significant positive impacts in the medium to long term.

Geology, Soils & Landuse - Implementation of the proposed policy will have direct, moderate positive impacts on local soil and land resources in the medium to long term, as will continue to protect these resources from increased flood and erosion risk in the future. Coastal geology will also be protected in the medium to long term with this policy.

Water - There is the potential for short term, direct and indirect, slight negative impacts upon water quality as a result of augmentation and extension of shoreline management measures. These potential negative impacts on water quality can most likely be mitigated for with good timing and planning and good construction practices. Following any required construction there is the potential for impacts in the medium and long term from maintenance activities on the shoreline reinforcement, however these activities are only likely to occur infrequently and provided the maintenance is adequately planned and executed, any impacts on water quality should be localised and negligible.

Climatic Factors – The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 153 residential properties and 60 non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, moderate positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses, road and rail infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works. Consideration will need to be given during construction to the sub-sea telecommunications cable within this sub-cell.

In the medium to long term, several roads, including the A78, will directly benefit from the implementation of the proposed policy within this sub-cell. In addition to this, a total of 78 non-residential properties, including the Largs Ferry Terminal, Largs Yacht Haven and Fairlie Quay Marina, are likely to be protected from coastal flood risk and erosion. The positive impacts upon these assets and infrastructure in the medium and long term is therefore likely to be significant.

Following any required construction there is the potential for further disturbance impacts in the medium and long term from maintenance activities on the shoreline reinforcement, however these activities are only likely to occur infrequently and provided the maintenance is adequately planned and executed, any impacts on material assets and infrastructure should be localised and negligible.

Cultural, Architectural & Archaeological Heritage – The policy of holding the line along the shoreline of this sub-cell has the potential for direct, positive impacts on several listed buildings in the medium and long term by protecting them from coastal flooding and potentially from climate change influenced coastal flooding. Many of these heritage features are within Largs. There is also the potential for the shoreline reinforcement works in this area to have negative impacts on the setting of several listed buildings in the short term during construction; however these impacts could be mitigated for in the medium to long term with sensitive design that fits with the area.

Landscape & Visual Amenity - The augmentation of existing shoreline management measures to Hold the Line in this sub-cell is likely to cause short term, direct, slight, negative impacts to local receptors along the shoreline. Works are likely to be localised to the main risk areas, which should not have medium or long term impacts on the overall landscape and seascape of the sub-cell. All works should be adequately screened to minimise any potential construction phase visual impacts. Shoreline management measures at Largs and Fairlie will need to be well designed to minimise medium and long term impacts to the local views from the many receptors along the seafront in these areas.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the marina south of Largs, and river channels at Skelmorlie and Largs. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line policy within sub-cell 6B1, has the potential for short to long term, moderate, negative impacts on biodiversity, flora and fauna, due to potential impacts on a European site and local habitats and species. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, heritages features, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk.

7.3 SUB-CELL 6B2

Sub-cell	6B2
Local Authorities	North Ayrshire Council
Sub-cell Information	
<p>Sub-cell 6B2 extends from Hunterston Ore Terminal to Farland Head (Portencross). This section of shoreline is approximately 11.5km in length and is located entirely within the North Ayrshire Council area. Hunterston Power Station is located within this sub-cell. There are two policy units within this sub-cell.</p>	
6B2.1 – Hunterston – Advance the line.	
6B2.2 – Hunterston to Farland Head – Hold the line.	
Key Plan Issues	
<p>6B2.1 – One non-residential property at risk of coastal flooding at Hunterston construction yard. A localised area of minor road is at risk due to coastal erosion close to the power station.</p> <p>6B2.2 – No assets have been identified as being at risk due to coastal flooding or erosion within this policy unit.</p>	
Key Environmental Issues	
<p>Biodiversity, Flora and Fauna – There are three SACs and one SPA located in the vicinity of this sub-cell. Bankhead Moss SAC, Cockinhead Moss SAC and Dykeneuk Moss SAC are located inland from the coastline (all >5km) and are designated for the presence of raised bog habitats. Renfrewshire Heights SPA is located to the north of this sub-cell, and is designated for the presence of breeding hen harrier.</p> <p>Two Sites of Special Scientific Interest (SSSIs) are located within or adjacent to this sub-cell. These are Southannan Sands (designated for sandflats) and Portencross Woods (designated for upland mixed ash woodland).</p> <p>The Cumbraes Marine Consultaiton Area (MCA) is located within this sub-cell and supports populations of porbeagle shark, spiny dogfish, sandy ray and blue shark.</p>	
<p>Population & Human Health – This sub-cell is relatively sparsely populated, with the nearest town being Fairlie in policy unit 6B1.2. There is no direct risk to people as a result of coastal flooding or erosion within this sub-cell.</p>	
<p>Geology, Soils and Landuse – The brown soils found in this sub-cell are predominantly derived from basaltic rocks and overlie the slightly rocky hills and valley sides which make up the landform of this area. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Mixed Agriculture'; however the land along the shoreline in this area is largely used for industry.</p> <p>The coastal bedrock is composed of interbedded sandstone and conglomerate with siltstone and mudstone. The seabed is comprised of circalittoral fine and sandy mud and infralittoral mud and sand.</p>	
<p>Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell is made</p>	

up of the Largs Channel and the Seamill and Ardrossan Coastal Water Bodies. The former has an overall status of Good with High confidence. Its overall ecological status is of Good and its chemical status is of Pass. The latter has an overall status of Moderate with High confidence. It has a Moderate ecological status and its chemical status is of Pass. The Ayrshire Coast and Fairlie designated Shellfish Waters are within this sub-cell.

Climatic Factors – There are no residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell and no additional non-residential properties at risk over the current day 1:200 year scenario. Although climate change influenced flooding may inundate the sub-cell in certain areas there are very few receptors.

Material Assets & Infrastructure – The A78 is the only principle road within this sub-cell. There are also seven sections of standard track gauge which make up the two railway lines within this area; one of which constitutes part of the Ayrshire Coast Line connecting the likes of West Kilbride and Fairlie to Glasgow Central. There are two Industrial Emissions Directive Sites within this sub-cell; these are the Hunterston A and Hunterston B sites. There are also two onshore wind farms; the Milour Hill Community Windfarm and the Wardlaw Wood windfarm. The Western HVDC Link power cable is proposed for the sub-cell.

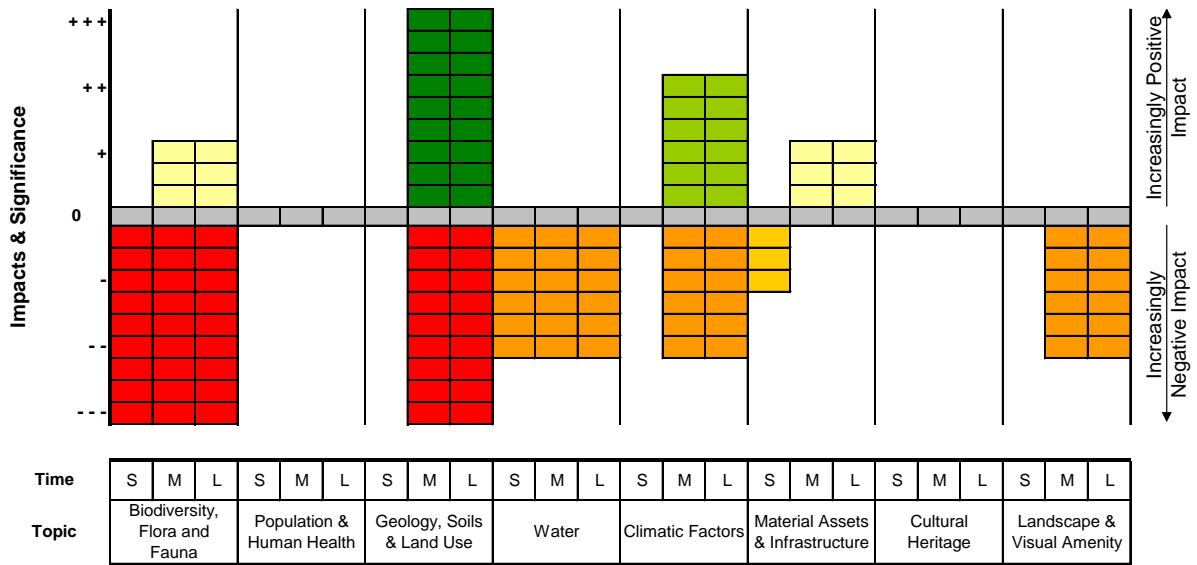
For the 1:200 year coastal flooding current day scenario there is only one non-residential property at risk of flooding. There is no risk to non-residential properties due to coastal erosion; however a small stretch of minor road may be affected by it.

Cultural, Architectural & Archaeological Heritage – There are six listed buildings and two scheduled monuments situated within this sub-cell. There are also a number of Canmore Sites including Hunterston Sands, Stoney Port and Hunterston Mill.

A number of vessels have been presumed lost and a number of wrecks found within this sub-cell. Coastal built heritage features such as the Carronade are also located along this section of the coast.

Landscape & Visual Amenity Baseline – This aspect of the Ayrshire coastline is defined by its raised beaches. Along the shoreline to the south of Hunterston the raised beach widens. This forms an area of coastal lowland between the main area of upland to the east and Goldenberry Hill to the west. Despite the elevated nature of the raised cliff-line, tall structures such as masts are relatively few. The principle exception to this rule is at Hunterston, where structures associated with the coal terminal, and the pylons serving the power station, are prominent features. Considerable landscaping and screening dictate that the visual impact of the facility is limited locally. The Mainland Special Landscape Area is inland from the shoreline of this sub-cell, in the hills overlooking the coastline.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-3	-3 / 1	-3 / 1
Population & Human Health (PHH)	0	0	0
Geology, Soils and Landuse (S)	0	-3 / 3	-3 / 3
Water (W)	-2	-2	-2
Climatic Factors (C)	0	-2 / 2	-2 / 2
Material Assets & Infrastructure (MA)	-1	1	1
Cultural, Architectural & Archaeological Heritage (H)	0	0	0
Landscape & Visual Amenity (L)	0	-2	-2

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policies of Advance the Line and Hold the Line in this sub-cell have the potential for short term, slight, negative impacts on local habitats and species from construction of hard defences, as well as potential for slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on the three SACs designated for raised bog habitats (Bankhead Moss, Cockinhead Moss and Dykeneuk Moss), as there is no pathway by which impacts could occur on the designated raised bog habitats from implementation of shoreline management measures. Hen harrier, the designated species of Renfrewshire Heights SPA, will not be affected as they do not use intertidal or shoreline habitats, and any shoreline management measures will be at a greater distance than the maximum indicated for disturbance of the species.

Southannan Sands SSSI is designated for intertidal sandflats; there is potential for short to long term, significant, negative impacts on this site from construction or rehabilitation of hard defences and the potential reclamation of land, including disturbance of species using the habitat and disturbance or damage to habitat such as dwarf eelgrass *Zostera noltei*. It should be possible to mitigate for significant impacts with good construction practice to ensure that shoreline protection measures do not encroach upon the designated site boundary.

There is potential for short term, slight, negative impacts through direct, temporary, local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark in the Cumbraes Marine Conservation Area. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze, and in the location of proposed land reclamation at Hunterston.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for slight, positive, impacts through creation of habitat for local flora and fauna.

Population & Human Health – There are unlikely to be any significant, positive or negative impacts upon local population and human health as a result of proposed policies within this sub-cell, as there are no residential properties within the vicinity of the shoreline that could be affected.

Geology, Soils & Landuse – If the shoreline were to be advanced at Hunterston there would be the medium and long term gain of new land resource that would be protected from flooding and erosion, which is likely to be used for industrial purposes. There is no significant soil or geological resource within the sub-cell.

Alteration of the shoreline by advancing the line however, has the potential to impact on the natural coastal processes and may impact sediment transport within sub-cell 6B2, including potentially the habitats and species of the Southannan Sands SSSI. Detailed coastal process modelling in combination with ecological assessment of any proposals would need to be thoroughly investigated to gain a full appreciation of impacts.

Water – Advancing the shoreline at Hunterston is likely to give short term, slight, negative impacts on the water quality in the area, with the potential for increased sedimentation and contaminated sediment mobilisation. Construction works for advancing the line will need to be well planned and timed to minimise potential impacts on water quality. In the medium and long term there is the increased potential for impediment of waterbody objectives under the WFD with more man-made structures impacting the coastal morphology. The area is however significantly impacted already with industrial infrastructure. There is the potential for advancing the line to have cumulative impacts with the impacts of the existing infrastructure and industrial activity.

Climatic Factors - The proposed policy of advancing the line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. There are however, no additional properties at risk from the 1:200 year climate change scenario flooding event. In the medium to long term, the implementation of the proposed policy may have direct, moderate, positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell. However, advancing the line and increased industrialisation may also cause the permanent loss of GHG sequestering natural cover along the shoreline of the sub-cell.

Material Assets & Infrastructure - During the construction phase of proposed policy measures there is potential for temporary, slight, negative disturbance impacts upon local road infrastructure, however given the industrial nature of this area, any short term construction impacts on local industry are likely to be insignificant in the setting.

The Western HVDC Link power cable is proposed for this sub-cell and consideration should be given to the potential cumulative impacts of Ayrshire SMP and Western HVDC Link works. Good construction planning and timing of works should be able to mitigate for potential cumulative impacts.

In the medium to long term, as a result of proposed policy within unit 6B2.1, one non-residential property will be protected from coastal flood risk and one minor road will be protected from coastal erosion, which will provide for direct, slight, positive impacts.

Cultural, Architectural & Archaeological Heritage – Advancing the line in the sub-cell will have no impacts on any know heritage features in the short, medium or long term. There is the potential for shoreline advancement works in the sub-cell to discover previously unknown heritage features, including shipwrecks. Archaeological investigations and monitoring are likely to be required prior to and during construction works.

Landscape & Visual Amenity - Given the highly industrial nature of the sub-cell and the lack of local receptors, the local landscape in the area for advancing the line would be considered to be robust. This policy is likely to result in temporary and permanent, moderate, negative impacts on the landscape in the short, medium and long term. If planned and designed well, the shoreline management measures may have limited impacts on the already impacted area; however any infrastructure that sits on the reclaimed areas may be more intrusive.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence, however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the area around Hunterston terminal, the pier at Goldenberry and the pier north of Farland Head. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Advance the Line and Hold the Line policies within sub-cell 6B2 have the potential for short to long term, moderate to significant, negative impacts on biodiversity, flora and fauna, due to potential impacts on the intertidal sandflats of the Southannan Sands SSSI, and on water quality from potentially increased sedimentation and contaminated sediment mobilisation. There is the potential for medium to long term, significant, negative impacts on coastal processes from alteration of the shoreline. There is also the potential for medium to long term, moderate, negative impacts on climatic factors and the local landscape from the permanent alteration of the shoreline and loss of GHG sequestering vegetation, from shoreline reclamation. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on material assets and infrastructure. There is the potential for medium to long term, slight to significant, positive impacts on soils, land use, material assets and infrastructure, climatic factors and biodiversity, flora and fauna. These impacts are from creating new land resource and protecting features and assets from the current day flood and erosion risk and future predicted risk.

7.4 SUB-CELL 6C1

Sub-cell	6C1
Local Authorities	North Ayrshire Council
Sub-cell Information	
Sub-cell 6C1 extends from Farland Head to Ardrossan Harbour. This section of shoreline is approximately 14.5km in length and is located entirely within the North Ayrshire Council area. West Kilbride and part of Ardrossan are located within this sub-cell. There is only one policy unit within this sub-cell.	
6C1.1 – Farland Head to Ardrossan – Hold the line.	
Key Plan Issues	
6C1.1 – A number of properties are at risk of coastal flooding in the vicinity of Portencross Castle, along Eglinton Road and at Ardrossan Marina. No assets were found to be at risk due to coastal erosion. There is risk to Scottish Water assets.	
Key Environmental Issues	
Biodiversity, Flora and Fauna – There are three SACs and one SPA located in the vicinity of this sub-cell. Bankhead Moss SAC, Cockinhead Moss SAC and Dykeneuk Moss SAC are located inland from the coastline (all >5km) and are designated for the presence of raised bog habitats. Renfrewshire Heights SPA is located to the north of this sub-cell, and is designated for the presence	

of breeding hen harrier.

Portencross Woods SSSI is situated directly to the north of this sub-cell, and is designated for upland mixed ash woodland.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area.

The invasive non-native brown alga Sargassum is known to occur in this area of the Ayrshire coastline.

Shellfish growing waters are present within this sub-cell.

Population & Human Health – There are two main settlements within this sub-cell, West Kilbride and Ardrossan. West Kilbride has a population of approximately 4,760 people, with a population density of 24 people / ha, while the harbour town of Ardrossan has a population of 10,930, with a population density of 34 people / ha.

For the current day scenario 1:200 year flood event in the sub cell there is only one residential property at risk, which is very low. There are no properties at risk of coastal erosion within this sub-cell. There is a known risk from wave overtopping at Ardrossan.

Geology, Soils and Landuse – The brown soils which dominate this area are largely derived of raised beach sands and gravels of carboniferous rocks. They overlie the raised beach terraces which characterise the area. To the south of the sub-cell, the brown soils are predominantly derived of upper red sandstone and overlie the non-rocky undulating lowlands of the area. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Mixed Agriculture’.

The coastal bedrock is made up of interbedded sandstone and conglomerate whilst the seabed is comprised of infralittoral rock, and mixed and coarse sediment with some shallow circalittoral rock and other hard strata.

The area around West Kilbride is used for housing, retail and as open space. In Ardrossan, where it is susceptible to coastal flood risk, land is used for housing, retailing, industry and open space.

There is a risk of coastal erosion within this sub-cell to the north of Ardrossan, on the mainland facing Horse Isle. Accretion is found throughout the length of this sub-cell; from Farland Head to Ardrossan Harbour.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Seamill and Ardrossan Coastal Water Body. It has an overall status of Moderate with High confidence, with an overall ecological status of Moderate and a chemical status of Pass.

Climatic Factors – There are almost 330 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is over 700 people; over 300 more people than are at risk from the current day 1:200 year event. There are also 75 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, over 70 more than are at risk from the current day 1:200 year event.

Material Assets & Infrastructure – There are two principle roads within this sub-cell; these are the A738 and A78. There are also two sections of railway within this area; both of which constitute part of the Ayrshire Coast Line connecting the likes of West Kilbride and Ardrossan to Glasgow Central, and two sub-sea telecommunications cables which run from Ardneil to Corrie and from Ardrossan to Carrickfergus (Northern Ireland). The Kintyre to Hunterston 1 North active power line is also within this area, connecting to the mainland at Ardneil Bay. There is residual sub-sea cable infrastructure present within this sub-cell and the Ardrossan Extension windfarm exists within this area. Ardrossan harbour, which hosts the Caledonian MacBrayne ferry fleet servicing Brodick and Campbeltown, is situated within this sub-cell; as is Clyde Marina.

The risk to material assets of coastal flooding is present within this sub-cell. In the 200 year scenario there are approximately five non-residential properties at risk of coastal flooding. There is also risk to a portion of B road and minor road. There is no direct risk from coastal erosion to non-residential properties or roads in this sub-cell.

Cultural, Architectural & Archaeological Heritage – Within this sub-cell there are a large number of heritage features. These include 42 listed buildings and six scheduled monuments. The West Kilbride Conservation Area is also within this sub-cell; as are a number of Canmore Sites including Ardneil Bay, Boydston and Montfode Braes. Coastal built heritage features in the sub-cell include the Marion and the Phoenix situated off the coast of Portencross. A number of vessels have also been presumed lost within the vicinity of this sub-cell and a number of wrecks have been found. Between this sub-cell and sub-cell A1 (approximately half way along the Ardrossan - Brodick Caledonian MacBrayne ferry route) lies the HMS Dasher. This is a Control Site designated under the Protection of Military Remains Act 1986.

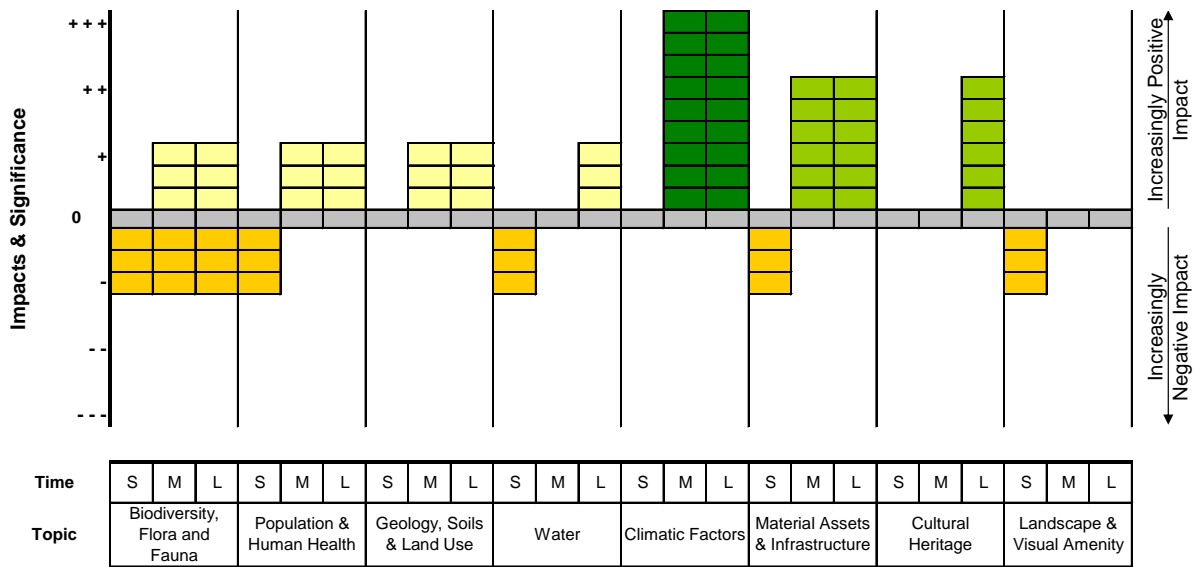
Landscape & Visual Amenity – This aspect of the Ayrshire coastline is defined by its raised beaches which are particularly evident at Portencross.

These raised beaches vary in land use but are often farmed; producing some of the more productive agricultural land in Ayrshire. The steep escarpment of the beaches is invariably clothed in rich, broadleaf woodland with dramatically wind sheared canopies.

Settlements such as Portencross sit comfortably against the steep former cliff line whilst more recent settlements have taken the form of ribbon developments along the coastal roads. This has the effect of extending the influence of the urban area along the coast thereby weakening the distinctive character of the raised beach landscape.

The Horse Isle Special Landscape Area is situated offshore of this sub-cell near Ardrossan.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1 / 1	-1 / 1	-1 / 1
Population & Human Health (PHH)	-1	1	1
Geology, Soils and Landuse (S)	0	1	1
Water (W)	-1	0	1
Climatic Factors (C)	0	3	3
Material Assets & Infrastructure (MA)	-1	2	2
Cultural, Architectural & Archaeological Heritage (H)	0	0	2
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in this sub-cell has the potential for short term, slight, negative impacts on local habitats and species from construction or rehabilitation of hard defences, as well as potential for long term slight positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on the three SACs designated for raised bog habitats (Bankhead Moss, Cockinhead Moss and Dykeneuk Moss), as there is no pathway by which impacts could occur on the designated raised bog habitats from implementation of shoreline management measures. Hen harrier, the designated species of Renfrewshire Heights SPA, will not be affected as they do not use intertidal or shoreline habitats and any shoreline management measures will be at a greater distance than the maximum indicated for disturbance of the species.

Portencross Woods SSSI is situated directly to the north of this sub-cell, and is designated for upland

mixed ash woodland; there is no pathway by which impacts could occur on the designated habitat as a result of the proposed shoreline management measures.

There is potential for short term, slight, negative impacts through direct temporary local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

There is potential for spread of the invasive alga *Sargassum* during construction however this could be mitigated for with strict site practice and adherence to best practice protocols.

Should soft shoreline protection measures such as dune stabilisation or nourishment be used in certain locations, these have the potential for long term slight positive impacts, through restoration and/or creation of habitat for local flora and fauna.

Population & Human Health - During the rehabilitation/construction phase of this proposed policy measure there is the potential for temporary, direct and indirect, slight negative impacts upon local population and human health due to disturbance, such as from noise, vibration, pollution, dust and traffic etc., particularly around Ardrossan. There is also the potential for these impacts to be re-occurring in the future due to maintenance works; however these re-occurring impacts are likely to be negligible. These disturbance impacts should be taken into account during detailed design and construction planning so as to prevent, reduce and as fully as possible offset all such impacts.

The result of policy related works is the slight positive impacts in the medium and long term from protection of the local population within this sub-cell, even though for the current day scenario 1:200 year event this is only benefitting one residential property.

Geology, Soils & Landuse – With this policy there are unlikely to be significant impacts upon local soils, geology and land use in the short, medium or long term. There is no agricultural soil resource that is likely to benefit from or be impacted by this policy, however recreational areas like the West Kilbride Golf Club may have some slight benefits in the medium and long term from integrated shoreline management helping to maintain the land resource. Future land use in the Ardrossan area at risk of climate change influenced flooding is planned for housing, however coastal flooding protection is included as part of the works, which should minimise or avoid the potential for negative impacts. Scottish water assets that need managed for erosion risk within the sub-cell will need to do so in line with the natural coastal processes of the sub-cell.

Water - There is the potential for short term, direct and indirect, slight negative environmental impacts upon water quality as a result of augmentation and extension of shoreline management measures. These potential negative impacts on water quality can most likely be mitigated for with good timing and planning and good construction practices. Following any required construction there is the potential for impacts in the medium and long term from maintenance activities on the shoreline reinforcement, however these activities are only likely to occur infrequently and provided the maintenance is adequately planned and executed, any impacts on water quality should be localised and negligible. The management of erosion risk to Scottish Water assets along the shoreline has the potential for slight, positive impacts in the long term, by avoiding the potential for asset failure and spills to the Seamill and Ardrossan Coastal Water Body. There are no sensitive or protected waterbodies within this sub-cell.

Climatic Factors - The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could

provide protection to an additional 325 residential properties and 70 non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell is unlikely to have any significant impacts on GHG sequestering vegetation.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works.

In the medium to long term, five non-residential properties, including West Kilbride Golf Club, will directly benefit from the implementation of this policy option. So too will a small portion of B road and minor road, and Scottish Water assets. This represents a direct, moderate, positive impact of the implementation of proposed policy in the medium and long term for the small number of assets at risk.

Cultural, Architectural & Archaeological Heritage - The policy of holding the line along the shoreline of this sub-cell has the potential for direct, positive impacts on several listed buildings in the medium and long term by protecting them from climate change influenced coastal flooding. Most of these heritage features that will benefit are within Ardrossan. Shoreline reinforcement and management works in this area are unlikely to have negative impacts on the setting of these listed buildings during construction or in the medium and long term.

Landscape & Visual Amenity – The augmentation of existing shoreline management measures and construction of new measures in Ardrossan, to Hold the Line in this sub-cell is likely to cause short term, direct, slight, negative impacts to local receptors along the shoreline. Works are likely to be localised to the main risk areas, which should not have medium or long term impacts on the overall landscape and seascape of the sub-cell. Although the Special Landscape Area of Horse Isle is across North Bay from Ardrossan, there are no receptors to be impacted and this area is unlikely to be negatively affected by shoreline management works at Ardrossan. All works should be adequately screened to minimise any potential construction phase visual impacts. Shoreline management measures at Ardrossan will need to be well designed to minimise medium and long term impacts to the local views from the future receptors along the seafront in these areas.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation

Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the marina and harbour at Ardrossan, and river channels at Ardrossan and West Kilbride. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line policy within sub-cell 6C1, has the potential for short to long term, slight, negative impacts on local biodiversity, flora and fauna, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and potentially creating new areas for habitats to re-establish.

7.5 SUB-CELL 6C2

Sub-cell	6C2
Local Authorities	North Ayrshire Council/South Ayrshire Council
Sub-cell Information	
Sub-cell 6C2 extends from Ardrossan Harbour to Troon. The section of coastline is approximately 42.5km in length (including the inlet at the mouth of the River Irvine). This sub-cell is mostly located within the North Ayrshire Council area, however approximately 8km of the shoreline from the outskirts of Troon south are located in the South Ayrshire Council area. There are four policy units within this sub-cell.	
6C2.1 – Ardrossan to Stevenston – Hold the line.	
6C2.2 – Stevenston to Irvine Bay – Hold the line.	

6C2.3 – Irvine Bay to Gailles Burn – Hold the line.

6C2.4 – Gailles Burn to Troon – Hold the line.

Key Plan Issues

6C2.1 – Significant coastal flood risk adjacent at Canal Crescent (Stevenston). Potential flood risk to rail line at Saltcoats. Significant additional coastal flood risk at Saltcoats and Stevenston during climate change scenario. No non-residential properties at risk due to coastal erosion at Stevenston beach.

6C2.2 – Isolated areas of coastal flood risk adjacent to the River Irvine affecting three non-residential properties. No assets have been identified to be at risk due to coastal erosion, however unknown materials are present along the shoreline and there is potential for contamination if future erosion was to occur.

6C2.3 – Significant coastal flood risk adjacent to the River Irvine. No assets were identified as being at risk due to coastal erosion; however Local Authorities indicate that there is significant loss of sand dune at Barassie.

6C2.4 – Significant coastal flood risk in the vicinity of Portland St (Troon). No assets have been identified to be at risk due to coastal erosion in this policy unit.

Key Environmental Issues

Biodiversity, Flora & Fauna - There are three SACs located in the vicinity of this sub-cell. Bankhead Bankhead Moss SAC, Cockinhead Moss SAC and Dykeneuk Moss SAC are located inland from the coastline (all >5km) and are designated for the presence of raised bog habitats.

Four SSSIs are located within or adjacent to this sub-cell; Ardrossan to Saltcoats Coast (designated for geological formations), Bogside Flats (designated for mudflats and saltmarsh), Dundonald Woods (designated for upland mixed ash woodland and beetle assemblages) and Western Gailies (designated for sand dunes and invertebrate assemblages).

Two local nature reserves (LNR) are located in this area; Stevenston Beach and Ardeer Quarry. Four wildlife nature reserves are also situated in this area; Gailles Marsh, Shewalton Sandpits, Oldhall Ponds and Shewalton Wood (all within policy unit 6C2.3).

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Several salmonid rivers occur within this sub-cell.

Population & Human Health – In policy unit 6C2.1, the town of Saltcoats has a population of approximately 12,800 (37 people / ha) and Stevenston has a population of around 9,300 people (25 people / ha). Irvine, spanning policy units 6C2.2 and 6C2.3, is the town with the greatest population in this sub-cell at about 33,740 people, (21 people / ha).

Within this coastal sub-cell there are over 130 properties and over 280 people at risk from a 1:200 year coastal flood. There are no residential properties or people at risk of coastal erosion in the sub-cell.

In North Ayrshire, 49% of residents are considered to be in 'very good' health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in 'very bad' health which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – The bay of this sub-cell is largely defined by its soft sediment and the regosols of windblown sand parent material. To the south, brown soils define the area; forming, in part, the raised beach terraces and mounds which characterise the southern aspect of this sub-cell. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Arable Agriculture’ as well as ‘Land capable of supporting Improved Grassland’.

Sedimentary rock cycles form the bedrock to the north of the sub-cell whilst mudstone, siltstone, sandstone, coal, ironstone and ferricrete make up that of the south. The seabed is composed of circalittoral sand, rock and mixed sediment.

Land-use within this sub-cell is varied. The land uses in the main settlements of Irvine, Saltcoats and Stevenston is predominantly used for industry, housing, retail and open space. Each of these towns is susceptible to a degree of coastal flood risk.

Water – This sub-cell is within the Scottish River Basin District. This sub-cell forms part of two Coastal WFD Management Units; the Garnock/Irvine Estuary Unit and the North Ayrshire Coastal Unit. The former – a designated transitional waterbody - has an overall status of Good with Medium confidence, an overall ecological status of Good and an overall chemical status of Pass. The latter has an overall status of Moderate with Medium confidence. It also has an overall ecological status of Moderate and an overall chemical status of Pass. There are two designated bathing waters within this sub-cell, the Ardrossan and Saltcoats Bathing Waters and the Irvine Bathing Waters; both have an overall status of Poor.

The main risk of coastal erosion is observed at Saltcoats and on the Western Gales Golf Course at a rate of 3.2m and 0.7m per annum respectively. Accretion is observed between Ardrossan and Saltcoats and from Irvine southwards along Irvine Bay. Wave overtopping is only a problem in the sub-cell from Gales Burn to Troon.

Climatic Factors – There are over 700 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is over 1500 people; over 1250 more people than are at risk from the current day 1:200 year event. There are also almost 200 additional non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell over the current day 1:200 year scenario event.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A71, the A736, the A737, the A378, the A759 and the A78. There is also the Ayrshire Coast Line which connects the likes of Ardrossan, Saltcoats, Irvine and Barassie to Glasgow Central. There are several IED Sites within the sub-cell that relate to the food and beverage sector, the chemical industry, mineral industry, paper and wood production and processing, and water and waste-water management. There are six waste and/or waste water management sites within this sub-cell; though none of which are at risk of erosion. The Caledonian Papermill biomass plant is situated within this sub-cell, as are the GlaxoSmithKline Wind Project onshore wind farms.

The risk to material assets of coastal flooding is present within this sub-cell. In the 200 year scenario there are approximately 118 non-residential properties at risk. There is also a risk to A roads, B roads and minor roads. The risk posed to non-residential properties by coastal erosion is minimal, with no non-residential properties thought to be directly at risk of coastal erosion. One non-residential property is however within the vicinity (60m) of predicted coastal erosion and may therefore be subject to its affects to some small extent. No roads are anticipated to be at risk of coastal erosion within this sub-cell.

Cultural, Architectural & Archaeological Heritage – There are 276 listed buildings within this sub-cell. There are also four scheduled monuments, two Conservation Areas and one designated garden. A number of Canmore Sites can also be found here. These include the Saltcoats railway

station, Preen Hull and Gales Landing Point.

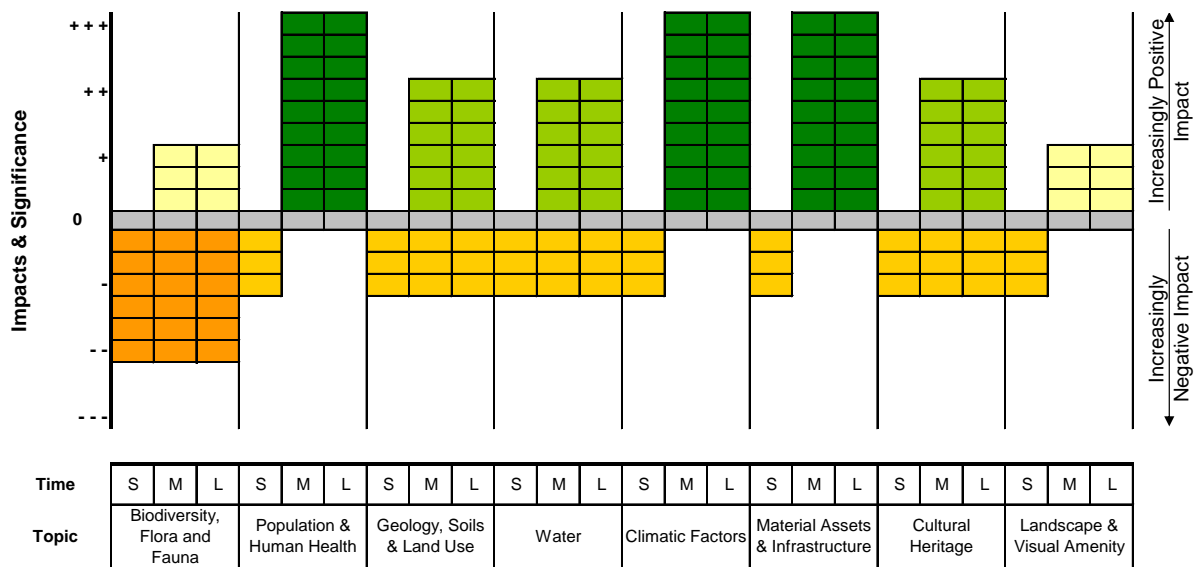
A number of vessels are presumed to have been lost within the vicinity of this sub-cell whilst a number of wrecks have also been found.

Landscape & Visual Amenity – The coastline within this sub-cell is marked by an area of lowland; much of which is comprised of windblown sand. This bay is defined by its sandy beach, sand dunes and low headlands. It is also, in part, defined by the complex estuarine landscape which is found at the meeting of the Irvine and Garnock rivers.

Much of the coastal lowland within this sub-cell has been lost due to the growth of settlements such as Irvine and Saltcoats. What is left is influenced by the presence of roads and railways and has been further modified by recreational developments, such as golf courses, and industrial and commercial developments also.

There are significant areas of greenspace situated along the coast throughout the majority of this sub-cell. The greatest areas of greenspace are situated near Ardrossan, Saltcoats and Irvine.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-2 / 1	-2 / 1
Population & Human Health (PHH)	-1	3	3
Geology, Soils and Landuse (S)	-1	-1 / 2	-1 / 2
Water (W)	-1	-1 / 2	-1 / 2
Climatic Factors (C)	-1	3	3
Material Assets & Infrastructure (MA)	-1	3	3
Cultural, Architectural & Archaeological Heritage (H)	-1	-1 / 2	-1 / 2

Landscape & Visual Amenity (L)	-1	1	1
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Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in this sub-cell has the potential for short term, moderate, negative impacts on nationally protected sites and short term, slight, negative impacts on local habitats and species. There is also potential for long term, slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on the three SACs designated for raised bog habitats (Bankhead Moss, Cockinhead Moss and Dykeneuk Moss), as there is no pathway by which impacts could occur on the designated raised bog habitats from implementation of shoreline management measures.

Dundonald Woods SSSI is situated several kilometres inland from Barassie and is designated for upland mixed ash woodland and associated beetle assemblages. Ardrossan to Saltcoats Coast SSSI is designated for its geological features of intrusive igneous rocks. No impacts are expected on these sites from the proposed shoreline management measures owing to a lack of any identifiable impact pathway, as the area of risk that would require management is at Stevenston Beach. Bogside flats SSSI is situated around the common estuary of the Rivers Irvine and Garnock at Irvine, and is designated for mudflats and saltmarsh. There is potential for short term, moderate, negative impacts on this site from construction or rehabilitation of hard defences. Western Gailes SSSI is situated along the coastline 1km south of Irvine. It is designated for the presence of nationally important invertebrate assemblages (particularly beetles and flies) and sand dunes. Flood defence/coastal defence works are listed as current pressures on these features, and there is potential for short to long term, moderate, negative impacts from construction or rehabilitation of hard defences. It should be possible to mitigate for any significant impacts on these sites with careful planning and good construction practice to ensure that shoreline protection measures do not encroach upon the designated site boundaries and do not increase sedimentation on SSSI rock outcrops. If soft engineering is installed adjacent to an SSSI, it needs to be sensitively designed so that the SSSI's sediment budget and wave regime is not adversely affected

There is potential for short-term, slight, negative impacts through direct temporary local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as dune stabilisation or nourishment be used in certain locations, these have the potential for slight, positive impacts, through restoration and/or creation of habitat for local flora and fauna. The introduction or rehabilitation of hard and soft shoreline protection measures in this sub-cell is anticipated to prevent erosion at Ardeer, Stevenston, the Barassie coast and North Sands, resulting in a reduced mobilisation of fill material into the sea, and thereby reducing negative impacts on aquatic habitats and species.

Population & Human Health - During the implementation / rehabilitation phase of potentially hard and soft engineering measures, there is the potential for slight, temporary, direct and indirect, negative impacts upon local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc., particularly in the more built up areas of Irvine, Troon and Stevenston. There is also the potential for these impacts to be re-occurring in the future due to maintenance works; however these re-occurring impacts are likely to be negligible. These disturbance impacts should be taken into account during detailed design and construction

planning so as to prevent, reduce and as fully as possible offset all such impacts.

The result of works is the medium to long term protection of local populations within the sub-cell. Over 130 residential properties will benefit from the implementation of policy; equating to over 290 people protected from coastal flood and erosion risk. This constitutes direct, significant positive impacts of implementing the policies proposed for this sub-cell.

Geology, Soils & Landuse – With the implementation of this policy there is the potential for disturbance to local soils, land use and potential sediment transport in the short term construction phase with potentially soft engineering works at Stevenston and Barassie/Irvine beach park, then potentially hard engineering works at the Stevenston Site, Troon and the River Irvine. In the medium and long term there is the potential for the management of significant areas of coastal erosion, including management of potential erosion of contaminated sediments and materials. This could lead to direct, moderate, positive impacts in the medium and long term with the application of a Hold the Line policy within this sub-cell.

With soft engineering measures such as beach re-nourishment and dune management there may be the continual loss of material in the medium and long term from natural erosion. These measures will likely require long term maintenance and may therefore again have the potential for some slight disturbance impacts to local soils, land use and sediment transport. Good planning and design of soft engineering measures is required to minimise the potential for these impacts.

There is unlikely to be any significant impacts on local geology with these policies in this sub-cell.

Water - There is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts are likely to occur intermittently as maintenance of the measures continues into the medium and long term. There are no sensitive or protected waterbodies within this sub-cell. Management of coastal erosion at the Stevenston Site has the potential for moderate positive impacts in the medium and long term by managing and containing the unknown and potentially contaminated materials that are at risk of erosion. Without this management of erosion these materials could be mobilised into the coastal waterbody.

Climatic Factors – The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 570 residential properties and 190 non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation. However, the soft engineering measures that could be implemented at Stevenston, Barassie and Troon North Sands could lead to the colonisation and establishment of more GHG sequestering vegetation.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road and rail infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works.

In the medium and long term, almost 120 non-residential properties, many of which are situated along Portland Street in Troon, are at risk of coastal flooding from the 1:200 year event. So too, are a number of A roads, B roads, minor roads and the railway line situated at Saltcoats. All of these assets will directly benefit from the implementation of the proposed policies insofar as they will be protected from the risk of coastal flooding and erosion. These are direct, significant, positive impacts in the medium and long term.

Cultural, Architectural & Archaeological Heritage - The policy of holding the line along the shoreline of this sub-cell has the potential for direct, positive impacts on a small number of listed buildings in the medium and long term by protecting them from current day and climate change influenced coastal flooding. Most of the heritage features that will benefit are within Troon and Irvine. Shoreline reinforcement and management works in this area have the potential for slight, negative impacts on the setting of heritage buildings and conservation areas in the short, medium and long term; particularly if defences are required along Harbour Street in Irvine. The visual or physical impacts of these flood defence measures may be reduced through good design and sensitive construction practices that are complimentary to the heritage features. There is no risk to known heritage features from coastal erosion within the sub-cell.

Landscape & Visual Amenity – The augmentation of existing shoreline management measures and construction of new measures to Hold the Line in this sub-cell is likely to cause short term, direct, slight, negative impacts to local receptors along the shoreline. Works are likely to be localised to the main risk areas, which should not have medium or long term impacts on the overall landscape and seascape of the sub-cell. All works should be adequately screened to minimise any potential construction phase visual impacts. Potential soft engineering works at Stevenston and Barassie/Irvine beach park may improve local views to receptors in the medium to long term, with slight, positive impacts.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant, negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the marina at Troon, and river channels between Ardrossan and Saltcoats, south of Saltcoats and at Irvine Bay. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line policy within Sub-Cell 6C2, has the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on a the Bogside flats SSSI and the Western Gailes SSSI. There is also the potential for short to long term, slight, negative impacts on soils and land use, water quality and heritage features, from recurring shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, local landscape, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the habitats and aesthetics of the shoreline with soft engineering works.

7.6 SUB-CELL 6C3

Sub-cell	6C3
Local Authorities	South Ayrshire Council
Sub-cell Information	
Sub-cell 6C3 extends from Troon to Ayr, is approximately 13km in length and is located entirely within the South Ayrshire Council area. There is only one policy unit within this sub-cell.	
6C3.1 – Troon – Ayr – Hold the line.	
Key Plan Issues	
6C3.1 – Significant coastal flood risk around West Portland St (Troon), Prestwick beach and York St (Ayr). Erosion at Newton shore, area of fill material needs protected. Scottish Water rising main runs along the shore and needs protected or moved.	

Key Environmental Issues

Biodiversity, Flora and Fauna – There are no SAC or SPA sites located in the vicinity of this sub-cell.

Troon Golf Links and Foreshore SSSI is located in this sub-cell, along the coastline immediately south of Troon, and is designated for its sand dune system.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. A designated seal haul-out site is located offshore on Lady Isle.

Population & Human Health – The main populated areas in this sub-cell are at Troon, Ayr and Prestwick. Troon has a population of approximately 14,680, which is similar to the population of Prestwick at around 14,750 people. In both cases, the population density is approximately 25 people/ha. In Ayr the population is around 47,190 people.

Within this coastal sub-cell there are almost 320 residential properties and over 700 people at risk from a 1:200 year coastal flood. There are no residential properties or people at risk of coastal erosion in the sub-cell. Significant coastal flood risk has been identified around West Portland St (Troon), Prestwick beach and York St (Ayr). The Local Authorities have indicated Titchfield Road and adjacent property gardens have flooded in the past due to wave overtopping.

In South Ayrshire, 51% of residents are considered to be in 'very good' health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in 'very bad' health which is the same as than the national average.

Geology, Soils and Landuse – The soft sediment coastline of this sub-cell is predominantly made up of brown soils derived from raised beach sand and gravel parent material, which in part make up the raised beach mounds and terraces of the area. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Arable Agriculture' and 'Land capable of supporting Improved Grassland'.

Mudstone, siltstone, sandstone, coal, ironstone and ferricrete with some unnamed igneous intrusion make up the bedrock geology of this sub-cell. The seabed is comprised of infralittoral rock and sand, and shallow circalittoral mixed sediment. There is reported to be Erosion at Newton shore, with an area of fill material that needs protected.

The land use in the main areas at risk, such as Troon and Prestwick is largely for retail and housing purposes, while in Ayr the land use is mainly industry and retail with some housing and leisure/tourism.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Ayr Bay Coastal Water Body, which has an overall status of Good with Medium confidence, an overall ecological status of Good and an overall chemical status of Pass. Also within this sub-cell is the Transitional Water Body of the Ayr Estuary, which has an overall status of Good Ecological Potential with Medium confidence. Its overall ecological status is Bad and its overall chemical status is Pass. There are two designated bathing waters within this sub-cell; Troon (South Beach) Bathing Waters and the Prestwick Bathing Waters. The former of these waters has an overall status of Good whilst the latter has an overall status of Poor.

Climatic Factors – There are over 650 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is almost 1500 people; over 750 more people than are at

risk from the current day 1:200 year event. There are also almost 375 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A719, the A759 and the A79. There are also two sections of railway within this area; one of which makes up part of the Ayrshire Coast Line connecting the likes of Prestwick and Troon to Glasgow Central. There are two IED Sites within this sub-cell; these are the Heathfield Abattoir and Hillhouse Quarry. Troon harbour and Troon Yacht Haven are also situated within this sub-cell.

There is a risk of coastal flooding to material assets within this sub-cell. In the 200 year scenario there are over 260 non-residential properties at risk. There are also a number of A roads, B roads and minor roads. There is no risk to transport or non-residential properties as a result of coastal erosion. A Scottish Water rising main runs along the shore and needs protected or moved in this sub-cell.

Cultural, Architectural & Archaeological Heritage – Within this sub-cell there are 139 listed buildings and four scheduled monuments. There are also three Conservation Areas; one of which is at risk of coastal flooding (Troon). There are several heritage sites within this sub-cell, such as Ballast Bank in Troon, New Prestwick Salt Works and Ayr Harbour.

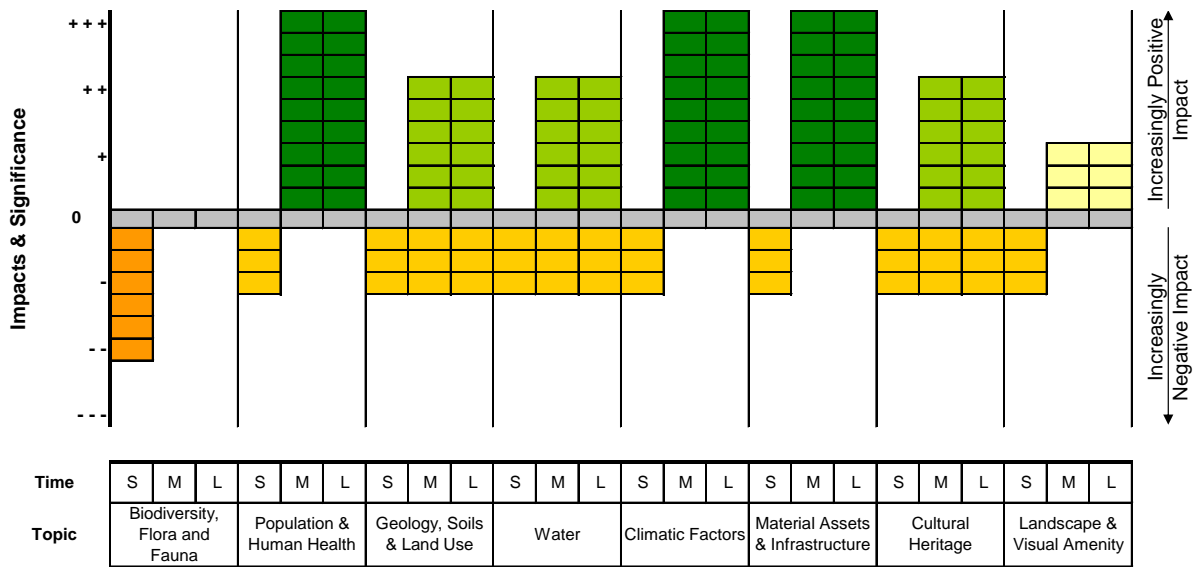
A number of vessels have been presumed lost and a number of wrecks found along this section of coast, such as the the Kaffir – a 20th century Puffer.

Landscape & Visual Amenity – The coastline within this sub-cell is marked by an area of lowland; much of which is comprised of windblown sand. This bay is defined by its sandy beach backed by areas of sand dune separated by low headlands. To the area just north of Ayr, the natural landscape is reduced due to the imposition of industry, sand and gravel works and the plantation of Scots pine. Such imposition is limited however, due to the nature conservation value associated with the Troon Golf Links and Foreshore.

Much of the coastal lowland in this area has been lost due to the growth of settlements such as Ayr, Prestwick and Troon. What is left is influenced by the presence of roads and railways and has been further modified by recreational developments, such as golf courses, and industrial and commercial developments also.

There are significant areas of greenspace situated throughout this sub-cell; along the coast around Troon and Prestwick through to Ayr.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1	3	3
Geology, Soils and Landuse (S)	-1	-1 / 2	-1 / 2
Water (W)	-1	-1 / 2	-1 / 2
Climatic Factors (C)	-1	3	3
Material Assets & Infrastructure (MA)	-1	3	3
Cultural, Architectural & Archaeological Heritage (H)	-1	-1 / 2	-1 / 2
Landscape & Visual Amenity (L)	-1	1	1

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in this sub-cell has the potential for short term, moderate, negative impacts on a nationally protected site, and short term, slight impacts on local habitats and species.

There is no potential for impacts on any European designated site from the proposed shoreline management measures in this sub-cell, owing to a lack of any identifiable impact pathway.

Troon Golf Links and Foreshore SSSI is situated along the coastline immediately south of Troon. It is designated for the presence of a nationally important sand dune system. Flood defence/coastal defence works are listed as current pressures on this feature, and there is potential for short term, moderate, negative impacts from construction or rehabilitation of hard defences. It should be possible to mitigate for any significant impacts on these sites with careful planning and good construction practice to ensure that shoreline protection measures do not encroach upon the designated site

boundary.

There is potential for short term, slight, negative impacts through direct, temporary, local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Population & Human Health - During the implementation/rehabilitation of defences, there is the potential for slight, temporary, direct and indirect, negative impacts upon local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc., particularly in the more built up areas of Troon and Prestwick. There is also the potential for these impacts to be re-occurring in the future due to maintenance works; however these re-occurring impacts are likely to be negligible. These disturbance impacts should be taken into account during detailed design and construction planning so as to prevent, reduce and as fully as possible offset all such impacts.

The management of potentially hazardous fill material along a section of shoreline at Newton shore could provide moderate, positive impacts to local population and human health in the medium and long term.

The result of works is the medium to long term protection of local populations within the sub-cell. Almost 320 residential properties will benefit from the implementation of this policy. This equates to almost 700 people who will be protected from the risk of coastal flooding, and from potentially contaminated materials at Newton Shore. This constitutes direct, significant, positive impacts of implementing the policy proposed for this sub-cell in the medium and long term.

Geology, Soils & Landuse - With the implementation of this policy there is the potential for disturbance to local soils, land use and potential sediment transport in the short term construction phase with potentially soft and hard engineering works. In the medium and long term there is the management of erosion of potentially contaminated materials. This could lead to direct, moderate, positive impacts in the medium and long term with this policy of Hold the Line in this sub-cell.

With soft engineering measures such as beach re-nourishment there may be the continual loss of material in the medium and long term from natural erosion. These measures will likely require long term maintenance and may therefore again have the potential for some slight disturbance impacts to local soils, land use and sediment transport. Good planning and design of soft engineering measures is required to minimise the potential for these impacts.

Water – There is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts are likely to occur intermittently as maintenance of the measures continues into the medium and long term. There are no sensitive or protected waterbodies within this sub-cell. Management of coastal erosion at Newton shore has the potential for moderate, positive impacts in the medium and long term by managing and containing the unknown and potentially contaminated materials that are at risk of erosion. Without this management of erosion these materials could be mobilised into the coastal waterbody.

Climatic Factors - The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 350 residential properties and 110 non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the

medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by way of managing the increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation. However, the soft engineering measures that could be implemented that could lead to the colonisation and establishment of more GHG sequestering vegetation.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works.

In the medium to long term, a number of roads will directly benefit from the implementation of proposed policy, insofar as they will be protected from the risk of coastal flooding and erosion. There are over 260 non-residential properties, including the Royal Troon and Prestwick Golf Clubs that will be protected from coastal flood risk. There will therefore be direct, significant, positive impacts in the medium and long term from this policy, on material assets and infrastructure.

Cultural, Architectural & Archaeological Heritage – The policy of holding the line along the shoreline of this sub-cell has the potential for direct, positive impacts on a small number of listed buildings and the Troon and Southwood Heritage Conservation Area, in the medium and long term, by way of protecting them from current day and climate change influenced coastal flooding. Most of these heritage features that will benefit are within Troon. Shoreline reinforcement and management works in this area have the potential for negative impacts on the setting of the Troon and Southwood Heritage Conservation Area in the short, medium and long term. The visual or physical impacts of these flood defence measures may be reduced through good design and sensitive construction practices that are complimentary to the heritage architecture of the area. There is no risk to known heritage features from coastal erosion within the sub-cell.

Landscape & Visual Amenity - The augmentation of existing shoreline management measures and the construction of new measures to Hold the Line in this sub-cell is likely to cause short term, direct, slight, negative impacts to local receptors along the shoreline. Works are likely to be localised to the main risk areas, which should not have medium or long term impacts on the overall landscape and seascape of the sub-cell. All works should be adequately screened to minimise any potential construction phase visual impacts. Potential works at Newton shore may improve local views to receptors in the medium to long term, with slight, positive impacts.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no

significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the harbour at Ayr, and river channels at Ayr and Prestwick beach. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line policy within sub-cell 6C3, has the potential for short to long term, slight, negative impacts on soils, land use, water quality and heritage features, from recurring, localised shoreline management works. There is the potential for short term, moderate, negative impacts on local biodiversity, flora and fauna, and on the sand dune systems of the Troon Golf Links and Foreshore SSSI. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, water quality, climatic factors, material assets and infrastructure, heritage and the local landscape. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the aesthetics of the shoreline with soft engineering works.

7.7 SUB-CELL 6C4

Sub-cell	6C4
Local Authorities	South Ayrshire Council
Sub-cell Information	
Sub-cell 6C4 extends from Ayr to Dunure, is approximately 17km in length and is located entirely within the South Ayrshire Council area. There are two policy units within this sub-cell.	

6C4.1 – Ayr to Greenan Castle – Hold the line.

6C4.2 – Greenan Castle to Dunure – No active intervention.

Key Plan Issues

6C4.1 - Significant coastal flood risk at River St (Ayr), Westfield Rd/Clark Av / Arrol Dr (Seafield) and Gearhold Rd / Goukscroft Park (Doonfoot). No assets have been identified to be at risk due to erosion.

6C4.2 – Two non-residential properties at coastal flood risk in Dunure. No assets have been identified to be at risk due to erosion.

Key Environmental Issues

Biodiversity, Flora and Fauna – There are no SAC or SPA sites located in the vicinity of this sub-cell.

Maidens to Doonfoot SSSI is located along the coastline in this sub-cell, and is designated for several geological features, maritime cliffs and their associated invertebrate assemblages, upland mixed ash woodland, and vegetated shingle.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. There are a number of salmonid rivers within this sub-cell.

Population & Human Health – This sub-cell is relatively sparsely populated outside of the main settlements of Ayr and Doonfoot. The risk to this sub-cell from coastal flooding is significant with over 170 properties and over 380 people at risk from a 1:200 year coastal flood. There are no residential properties or people at risk of coastal erosion in the sub-cell. Significant coastal flood risk has been identified at River St (Ayr), Westfield Rd/Clarke Avenue/Arrol Dr (Seafield) and Gearholm Rd/Goukscroft Park (Doonfoot). Wave overtopping has been identified as a risk along the promenade at south Ayr town.

In South Ayrshire, 51% of residents are considered to be in 'very good' health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in 'very bad' health which is the same as than the national average.

Geology, Soils and Landuse – The soft sediment coastline of this sub-cell is predominantly made up of brown soils derived from raised beach sand and gravel. These form the beach mounds and terraces with their gentle slopes. To the south, the earth is largely composed of mineral gleys of basaltic rock parent material overlying the local undulating lowlands with their gentle slopes. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Arable Agriculture' and 'Land capable of supporting Mixed Agriculture'. Sandstone, siltstone and mudstone along with some unnamed igneous intrusion make up the bedrock of this sub-cell. The seabed is made up on shallow circalittoral sand and coarse sediment.

The landuse at the town of Ayr is predominantly for industry and retail, with housing and some leisure/tourism related use.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Ayr Bay and Culzean Coastal Water Bodies. Each of these water bodies has an overall status of Good with Medium confidence. They also have an overall ecological status of Good and an overall chemical status of Pass. The transitional Ayr Estuary water body has Good ecological potential with Medium confidence. Its overall ecological status is Bad and its overall chemical status is Pass. There are two designated bathing waters within this sub-cell, which are Ayr (South Beach) Bathing Waters and the Heads of Ayr Bathing Waters; both of which have an overall status of Poor.

Climatic Factors – There are over 570 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell. This is more than 1,260 people; over 880 more people than are at risk from the current day 1:200 year event. There are also almost 60 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A710, the A79, the A70, the A713 and the A719. There is also one section of railway within this area which connects Ayr to Glasgow Central. There is one IED Site; the Ayr Hospital on Dalmellington Road, Ayr.

There is a risk of coastal flooding to material assets within this sub-cell. In the 200 year scenario there are almost 30 non-residential properties at risk. There are also a small number of A roads, B roads and minor roads. There is no risk to material assets and infrastructure from coastal erosion within this sub-cell.

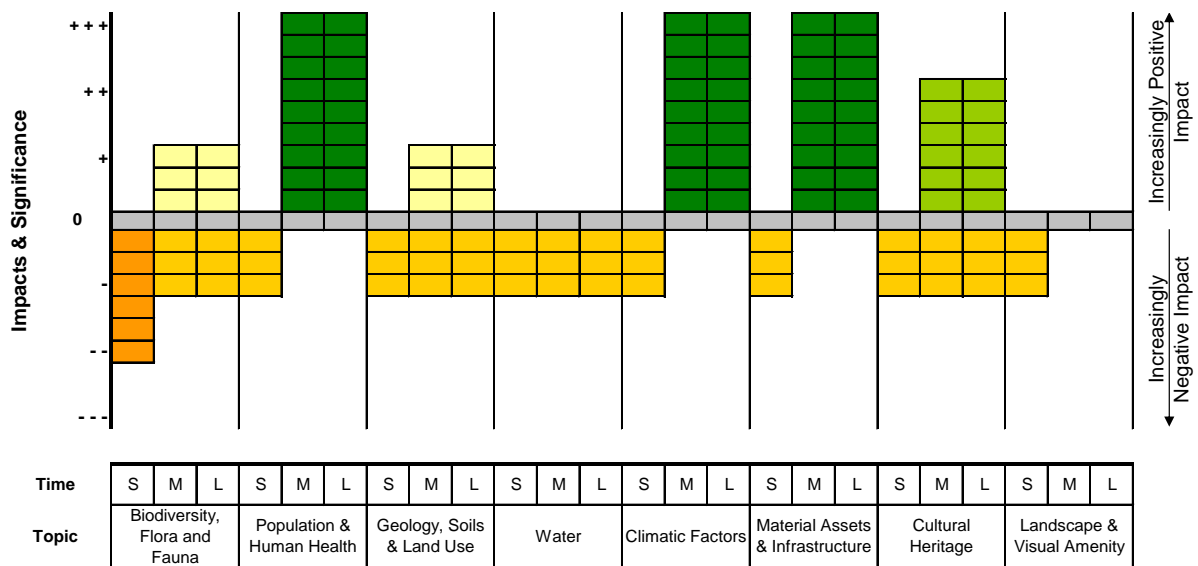
Cultural, Architectural & Archaeological Heritage – Within this sub-cell, there are 625 listed buildings and seven scheduled monuments. Of the latter, Dunure Castle and Dovecot is situated within an area of coastal flood risk. The castle is also one of the four Conservation Areas within this sub-cell. Heritage sites here include the Newton-upon-Ayr medieval burgh, Greenan Castle and Laigh Kyleston. Robert Burn's Birthplace is also situated in this sub-cell. This National Trust for Scotland Property is located in Alloway to the south of Ayr.

Although no significant erosion issues are identified in the sub-cell 6C4 as a whole there may be localised issues for the scheduled monuments of Heads of Ayr, fort 1050m NNW of Genoch Fam (SM5594) and Dunure Castle and Dovecot (SM6105).

A large number of vessels are presumed to have been lost within the waters of this sub-cell and a number of wrecks have also been found. One such wreck is the Equinox – a fishing vessel found just off the coast of Seafield.

Landscape & Visual Amenity – This aspect of the Ayrshire coastline is defined by its raised beaches, which are largely used for farming, providing some of the most productive agricultural land in Ayrshire. To the north of the sub-cell, the steep escarpment is invariably clothed in broadleaf woodland with dramatically wind-sheared canopies. There are significant areas of green space and greenbelt to the south of Ayr.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	--1 / 1	-1 / 1
Population & Human Health (PHH)	-1	3	3
Geology, Soils and Landuse (S)	-1	-1 / 1	-1 / 1
Water (W)	-1	-1	-1
Climatic Factors (C)	-1	3	3
Material Assets & Infrastructure (MA)	-1	3	3
Cultural, Architectural & Archaeological Heritage (H)	-1	-1 / 2	-1 / 2
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in the northern section of this sub-cell has the potential for short term, moderate, negative impacts on a nationally protected site, and for short term, slight, negative impacts on local habitats and species. There is, however, also the potential for slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on any European designated site from the proposed shoreline management measures in this sub-cell. This is owing to a lack of any identifiable impact pathway.

There is potential for short term, moderate, negative impacts on the vegetated shingle habitat of Maidens to Doonfoot SSSI from construction or rehabilitation of hard defences. This habitat occurs within a series of small bays between rocky headlands at Culzean Castle, Dunure Castle and

Fisherton Cottage. It should be possible to mitigate for any significant impacts on these sites with good construction practice and careful planning to ensure that shoreline protection measures do not encroach upon the designated site boundary. General sediment drift direction is also northwards in this area, away from the designated area and towards Ayr.

There is potential for short term, slight, negative impacts through direct, temporary, local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as nourishment or dune stabilisation be used in certain locations, these have the potential for slight, positive, impacts through restoration and/or creation of habitat for local flora and fauna.

Population & Human Health - During the implementation/rehabilitation of hard defences and the maintenance of South Pier, there is the potential for temporary, slight, negative impacts upon the local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc., particularly around Ayr.

The result of works is the medium to long term protection of local populations within the sub-cell. Over 170 residential properties will benefit from the implementation of this policy. This equates to around 380 people who will be protected from the risk of coastal flooding. This constitutes direct, significant, positive impacts of implementing the policy proposed for this sub-cell in the medium and long term.

Geology, Soils & Landuse - With the implementation of this policy there is the potential for disturbance to local soils, land use and potential sediment transport in the short term construction phase with potentially soft and hard engineering works. There is also likely to be slight, positive impacts in the medium and long term from protection of open space areas at Seafield.

With soft engineering measures such as beach re-nourishment and dune stabilisation there may be the continual loss of material in the medium and long term from natural erosion. These measures will likely require long term maintenance and may therefore again have the potential for some slight disturbance impacts to local soils, land use and sediment transport. Good planning and design of soft engineering measures is required to minimise the potential for these impacts. Given the predominant sediment drift direction from south to north in the sub-cell, works around Ayr are unlikely to impact the geology and habitats of the Maidens to Doonfoot SSSI.

Water - There is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts are likely to occur intermittently as maintenance of the measures continues into the medium and long term. There are no sensitive or protected waterbodies within this sub-cell.

There are unlikely to be any significant, positive or negative impacts upon water quality as a result of the No Active Intervention policy within unit 6C4.2.

Climatic Factors - The proposed policy of Hold the Line in policy unit 6C4.1 allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 400 residential properties and over 30 non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by being capable of managing the increased future risk

from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation. However the soft engineering measures that could be implemented that could lead to the colonisation and establishment of more GHG sequestering vegetation.

The proposed policy of No Active Intervention within policy unit 6C4.2 does not allow for planning for climate change, however there are no additional assets or people at risk.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works.

Within policy unit 6C4.1 there are over 20 non-residential properties in Ayr, Seafield and Doonfoot which are at risk of flooding in the 200 year scenario. A portion of A road and minor road, as well as the South Pier, are also at risk of flooding. These assets will directly benefit from the protection afforded by the implementation of proposed policy within this unit. The positive impacts upon assets and infrastructure in the medium and long term are therefore likely to be significant.

Within policy unit 6C4.2, there are two non-residential properties at risk in Dunure. These will not be protected as a result of the proposed policy for this unit. These low lying properties at Dunure Harbour may however be more resilient to coastal flood risk as are related to harbour activities.

Cultural, Architectural & Archaeological Heritage – The policy of holding the line along the shoreline of this sub-cell has the potential for direct, positive impacts on a small number of listed buildings and the Ayr II Heritage Conservation Area in the medium and long term by protecting them from current day and climate change influenced coastal flooding. Most of these heritage features that will benefit are within the Seafield and Belleisle areas. Shoreline reinforcement and management works in this area have the potential for negative impacts on the setting of the Ayr II Heritage Conservation Area in the short, medium and long term. The visual or physical impacts of these flood defence measures may be reduced through good design and sensitive construction practices that are complimentary to the heritage architecture of the area. There is also the potential for this policy to provide coastal flood protection to Greenan Castle, which is a Scheduled Monument.

In policy unit 6C4.2, there are a small number of heritage features; including Dunure Castle and Dunure Harbour, and the Dunure Conservation Area, that will not be protected as a result of the proposed unit policy and will thus be subject to ongoing coastal flood risk. This would present direct, moderate, negative impacts in the short, medium to long term; however these features may be more resilient to coastal flood risk and therefore the negative impacts may only be slight negative from the implementation of the proposed policy within this unit.

There is no risk to known heritage features from coastal erosion within the sub-cell.

Landscape & Visual Amenity - The augmentation of existing shoreline management measures and construction of new measures to Hold the Line in this sub-cell is likely to cause short term, direct, slight, negative impacts to local receptors along the shoreline. Works are likely to be localised to the main risk areas, which should not have medium or long term impacts on the overall landscape and seascape of the sub-cell. All works should be adequately screened to minimise any potential construction phase visual impacts and designs should be in line with the aesthetics of the local architecture in heritage conservation areas.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation

of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant, negative impacts on the coastal landscape.

- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence, however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the harbour at Ayr, and river channels at Ayr, Seafield and Doonfoot. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line and No Active Intervention policies within sub-cell 6C4 has the potential for short to long term, slight to moderate, negative impacts on local biodiversity, flora and fauna, and on the vegetated shingle habitat of the Maidens to Doonfoot SSSI. There is the potential for short to long term, slight, negative impacts on local soils, land use, water quality and heritage features, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, material assets and infrastructure, and landscape and visual amenity. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, climatic factors, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk.

7.8 SUB-CELL 6C5

Sub-cell	6C5
Local Authorities	South Ayrshire Council
Sub-cell Information	
<p>This sub-cell extends from Dunure to Turnberry, is approximately 14.5km in length and is located entirely within the South Ayrshire Council area. There is only one policy unit within this sub-cell.</p>	
<p>6C5.1 – Dunure to Turnberry – No active intervention.</p>	
Key Plan Issues	
<p>6C5.1 – Isolated areas of coastal flood risk have been identified at Maidenhead Bay and Turnberry lighthouse.</p>	
Key Environmental Issues	
<p>Biodiversity, Flora and Fauna – One SAC and one SPA are situated in the vicinity of this sub-cell; Lendalfoot Hills Complex SAC, designated for fen, grassland and heathland habitats, and Ailsa Craig SPA, designated for breeding seabird populations.</p> <p>Three SSSIs are located within or adjacent to this sub-cell; Maidens to Doonfoot, designated for its geological formations, maritime cliffs, invertebrate assemblages, upland mixed ash woodland and vegetated shingle; Turnberry Lighthouse to Port Murray, designated for its geological formations; and Turnberry Dunes, designated for its invertebrate assemblage.</p> <p>The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area.</p> <p>The invasive, non-native brown alga, Sargassum is present within this sub-cell.</p>	
<p>Population & Human Health – This sub-cell is relatively sparsely populated. The risk to people from coastal flooding is relatively low, with only one residential property at risk within the 200 year scenario. There are no people or properties at risk due to coastal erosion within this sub-cell.</p> <p>In South Ayrshire, 51% of residents are considered to be in ‘very good’ health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in ‘very bad’ health which is the same as than the national average.</p>	
<p>Geology, Soils and Landuse – The brown soils to the north of this sub-cell are largely derived from old red sandstone. To the south, the mineral gleys overlie the undulating foothills which characterise the area. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Mixed Agriculture’ and ‘Land capable of supporting Arable Agriculture.’</p>	

The bedrock of the sub-cell is principally composed of unnamed extrusive rock in the north and interbedded sandstone and conglomerate in the south. The seabed is comprised of infralittoral fine and muddy sand as well as shallow circalittoral sand.

Land use in this area around Maidens is largely used for residential purposes with community facilities and open space.

Water – This sub-cell is within the Scottish River Basin District. This shoreline of this sub-cell forms part of the Culzean Coastal Water Body. This water body has an overall status of Good with Medium confidence, an overall ecological status of Good and an overall chemical status of Pass. The designated Maidens Bathing Water is situated within this sub-cell; however it currently has an overall status of Poor.

Climatic Factors – There is one residential property at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is the same that is at risk from the current day 1:200 year event. There are also five non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – There are two principle roads within this sub-cell; these are the A77 and A719. The risk to material assets of coastal flooding is present within this sub-cell. In the 200 year scenario there are two non-residential properties at risk and a small section of minor road. There is no risk of coastal erosion to material assets within this sub-cell.

Cultural, Architectural & Archaeological Heritage – The Turnberry lighthouse and Keeper's house is the only of 30 listed buildings within this sub-cell which may have a slight risk of coastal flooding. Similarly, Turnberry Castle is the only of seven scheduled monuments which may have a slight risk. Culzean Castle is one of two National Trust for Scotland sites. It is also a designated garden and Canmore Site along with the likes of Port Shuchan and Isle Port landing points.

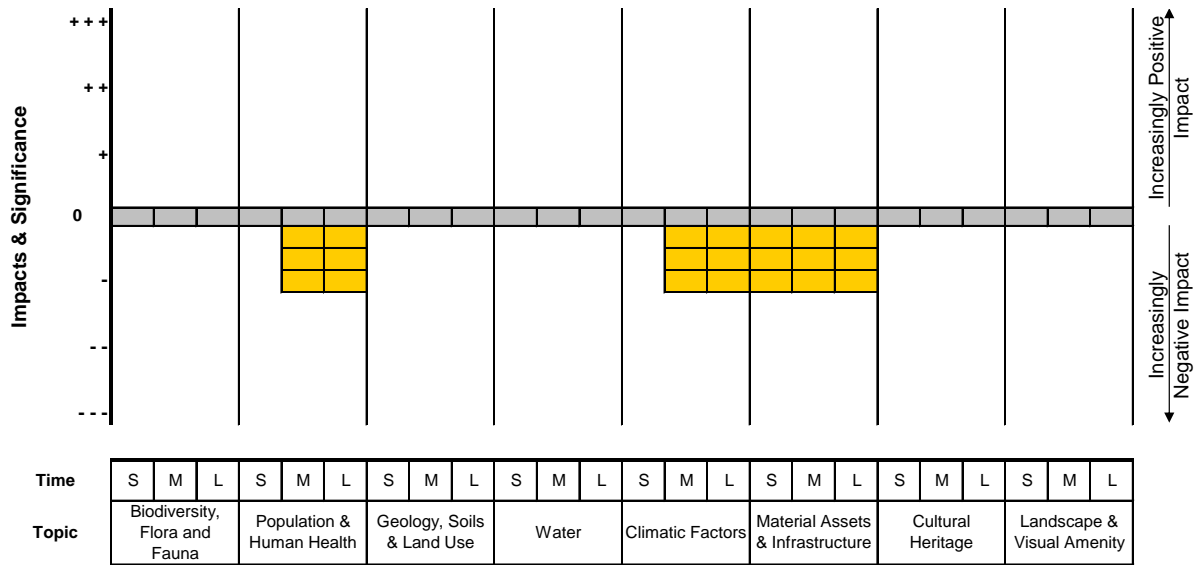
There are a number of vessels which are presumed to have been lost within this sub-cell and a number of wrecks which have also been found.

Landscape & Visual Amenity – Coastal and fluvial erosion has withered away much of the red sandstone which lies to the south of Brown Carrick Hill. As a result, a broad and shallow coastal valley and bay has been formed within this sub-cell, enclosed by moorland hills both to the north and south.

Landcover within the valley is made up of arable farmland (in the lower aspect of the valley), pastures (on mid slopes), and broadleaf and coniferous shelter belts and woodland. Field boundaries are marked by hedges and shelterbelts. Farms within the valley tend to be tucked into hollows or located so that they have limited impact upon the landscape.

The A719 swings inland to run around the mid-slopes of the valley. The section of this road referred to as 'Electric Brae' is situated here; its perceived uphill slope being an optical illusion.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	0	-1	-1
Geology, Soils and Landuse (S)	0	0	0
Water (W)	0	0	0
Climatic Factors (C)	0	-1	-1
Material Assets & Infrastructure (MA)	-1	-1	-1
Cultural, Architectural & Archaeological Heritage (H)	0	0	0
Landscape & Visual Amenity (L)	0	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of No Active Intervention in this sub-cell has no potential for short, medium or long term, negative or positive impacts on biodiversity, flora and fauna.

There is no potential for impacts on Lendalfoot Hills Complex SAC or Ailsa Craig SPA, or on the three SSSIs within this sub-cell, owing to the policy of No Active Intervention. Any changes to the designated habitats/species will be a result of natural change and not a result of the Shoreline Management Plan.

In addition, owing to the proposed policy of No Active Intervention, there is no potential for disturbance or displacement of local habitats and/or species or for the spread of the invasive alga *Sargassum* in this sub-cell as a result of the Shoreline Management Plan.

Population & Human Health - In the short term, there are unlikely to be any significant impacts upon population and human health as a result of proposed policy. In the medium to long term, as the likelihood of potential flood risk increases, proposed policy measures are unlikely to provide any protection to the one residential property at risk. Therefore, the policy may have a permanent, slight, negative impact in the medium to long term upon local population and human health.

Geology, Soils & Landuse - There are unlikely to be significant impacts upon local geology in the short, medium or long term as a result of the implementation of proposed policy within this sub-cell.

The implementation of this policy within this sub-cell will not mitigate for any impacts of coastal flood or erosion risk to soil and land resources. However, there appears to be minimal risk from coastal flooding and erosion to soil and land resources in the short, medium and long term within this sub-cell and therefore no impacts are anticipated.

Water - There are unlikely to be any significant impacts upon water quality a result of the implementation of proposed policy within this sub-cell. The impact of such in the short, medium and long term is therefore neutral.

Climatic Factors - There will be no change in GHG sequestering cover with the implementation of this policy. There are, however, a small number of additional non-residential properties that will not be protected from climate change influenced coastal flood risk in the medium to long term. This could lead to direct, slight, negative impacts.

Material Assets & Infrastructure - In the short, medium and long term, two non-residential properties will continue to be at risk of coastal flooding at Maidenhead Bay and Turnberry Lighthouse; as would be the case should no policy be applied. The implementation of proposed policy within this sub-cell is likely to have permanent, direct, slight, negative impacts upon the local material assets and infrastructure in the short, medium and long term.

Cultural, Architectural & Archaeological Heritage - In the short, medium to long term, three heritage sites (Turnberry Castle, Turnberry Lighthouse and Culzean Castle Gardens) may continue to be at risk of coastal flooding as a result of proposed policy. The risk at these sites is, however, quite low given that the features sit on relatively raised settings on the hard shoreline. Implementation of this policy is unlikely to have any significant impacts upon cultural, architectural and archaeological heritage in the short, medium and long term.

Landscape & Visual Amenity - There are unlikely to be any short, medium or long term, significant impacts upon local landscape/seascape and visual amenity within this sub-cell as a result of proposed policy.

Potential sources of in-combination effects identified as part of this assessment include:

- As the policy in this sub-cell is for No Active Intervention, there is no capacity for in-combination effects.

Key Conclusions:

Implementing the No Active Intervention policy within sub-cell 6C5 has the potential for short to long term, slight, negative impacts on people, climatic factors, and material assets and infrastructure. These impacts are due to the current day flood and erosion risk and future predicted risk to a small number of receptors not being managed by the policy. Individual property protection measures may however, be employed to manage these risks on a case by case basis.

7.9 SUB-CELL 6C6

Sub-cell	6C6
Local Authorities	South Ayrshire Council
Sub-cell Information	
This sub-cell extends from Turnberry to Bennane Head, is approximately 31km in length and is located entirely within the South Ayrshire Council area. There are three policy units within this sub-cell.	
6C6.1 – Turnberry to North Girvan – No Active Intervention.	
6C6.2 – Girvan – Hold the line.	
6C6.3 – South Girvan to Bennane Head – Hold the line/Managed Realignment	
Key Plan Issues	
6C6.1 – Isolated coastal flood risk identified to a single residential property at Dipple. There is the potential for erosion of agricultural land but risk is low.	
6C6.2 – Significant coastal flood risk adjacent to the Water of Girvan and A77. Significant joint fluvial and coastal flood risk with the Water of Girvan and Mill Burn. Erosion risk at Girvan golf club.	
6C6.3 – Isolated areas of the A77 were found to be at risk of coastal flooding. The A77 at woodland Bay Hotel was also found to be at risk due to erosion. The A77 is managed by Transport Scotland.	
Key Environmental Issues	
Biodiversity, Flora and Fauna – There are two SACs and two SPAs in the vicinity of this sub-cell;	

Lendalfoot Hills Complex SAC, designated for fen, grassland and heathland habitats, River Bladnoch SAC, designated for Atlantic salmon, Ailsa Craig SPA, designated for breeding seabird populations, and Glen App and Galloway Moors SPA, designated for breeding hen harrier.

There are nine SSSIs located within or adjacent to this sub-cell; Turnberry Dunes, designated for the invertebrate assemblages of its dune system; Girvan to Ballantrae Coast Section, designated for its geological formations; Byne Hill, designated for its geological formations; Pinbain Burn to Cainhill, designated for its geological formations, upland grassland and freshwater loch; Knockdaw Hill, designated for upland grassland and fen; Knockormal, designated for its geological formations; Littleton and Balhammie Hills, designated for upland grassland and fen; and Bennane Head Grassland, designated for lowland grassland and green-winged orchid. The Grey Hill Grasslands nature reserve is also located within this sub-cell.

The marine species short-beaked common dolphin, porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Several salmonid rivers occur within this sub-cell.

Population & Human Health – The main settlement in this sub-cell is Girvan, which is home to a population of approximately 6,650 people. In the 200 year coastal flood risk scenario there are approximately eight residential properties at risk, which are almost all in Girvan. There are no people or property at risk of coastal erosion within this sub-cell.

In South Ayrshire, 51% of residents are considered to be in ‘very good’ health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in ‘very bad’ health, which is the same as than the national average.

Geology, Soils and Landuse – Mineral gleys dominate the hard rocky coastline to the north of this sub-cell whilst brown soils can be found to the south. The former is derived of sandstone parent material and overlies the local undulating lowlands and foothills. The latter is of Palaeozoic grey wacke and shale. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Mixed Agriculture’ and ‘Land capable of supporting Improved Grassland’.

The bedrock to the north is made up of interbedded sandstone and conglomerate whilst wacke is present to the south of Girvan, and unnamed igneous intrusion is found along the coastline around Lendalfoot. The seabed is comprised of infralittoral sand and coarse sediment.

In this sub-cell, the land around Girvan is used for a mixture of community facility, industry, retail, redevelopment, conservation and settlement. The town of Turnberry is predominantly used for residential purposes.

A small section of the coast north of Lendalfoot is designated as the Western Southern Uplands Environmentally Sensitive Area (ESA); so designated ‘for the purpose of conserving, protecting and enhancing environmental features of the area by the maintenance or adoption of particular agricultural methods’.

The risk of coastal erosion is present at Woodland Bay, whilst accretion is observed elsewhere throughout the sub-cell; in areas such as Girvan and Lendalfoot.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell makes up part of the Girvan Coastal Water Body which has an overall status of Good with Medium confidence, an overall ecological status of Good and an overall chemical status of Pass. The Girvan Estuary Transitional Water Body, which is situated within this sub-cell has Good ecological potential with Medium confidence. Its overall ecological status is Poor and its overall chemical status is Pass. The designated Girvan Bathing Water is situated within this sub-cell and currently has an overall status of Poor.

Climatic Factors – There are 15 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is almost 35 people; approximately 15 more people than are at risk from the current day 1:200 year event. There are also 22 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A719, the A77 and the A714. There is also one section of railway line (the Ayrshire Coast Line connecting Girvan to Glasgow Central) within this area and two IED Sites; the Girvan Sewage Treatment Works and Straid Farm Landfill Site – neither of which are at risk of erosion. With regard to telecommunications infrastructure; the Scotland - N. Ireland 2 sub-sea cable runs from Girvan to Larne. Girvan Harbour is situated within this sub-cell.

In the 200 year coastal flood risk scenario there are over 10 non-residential properties at risk. There are also a small number of A roads, B roads and minor roads at risk. There are no non-residential properties affected by coastal erosion within this sub-cell. There are no roads directly affected by coastal erosion either, however a small proportion of A roads and minor roads run within the influence and/or vicinity of future predicted erosion.

Cultural, Architectural & Archaeological Heritage – There are 91 listed buildings and 11 scheduled monuments within this sub-cell. There is also one Conservation Area, which has a slight potential for risk of coastal flooding, along with several Canmore Sites including landing points at Turnberry Bay, Curragh and Port Cardloch. Girvan Mains, Roman camps, linear cropmark and enclosure (SM5596) extend close to the existing coastline.

There are a number of vessels presumed to have been lost within this sub-cell along with several wrecks which have been found also.

Landscape & Visual Amenity – This aspect of the Ayrshire coastline is defined by the raised beaches which have been carved into the soft red sandstone located here. Where harder volcanic rock reaches the shore, as it does to the south of Girvan, the rocky crags remain and the beach is often much narrower.

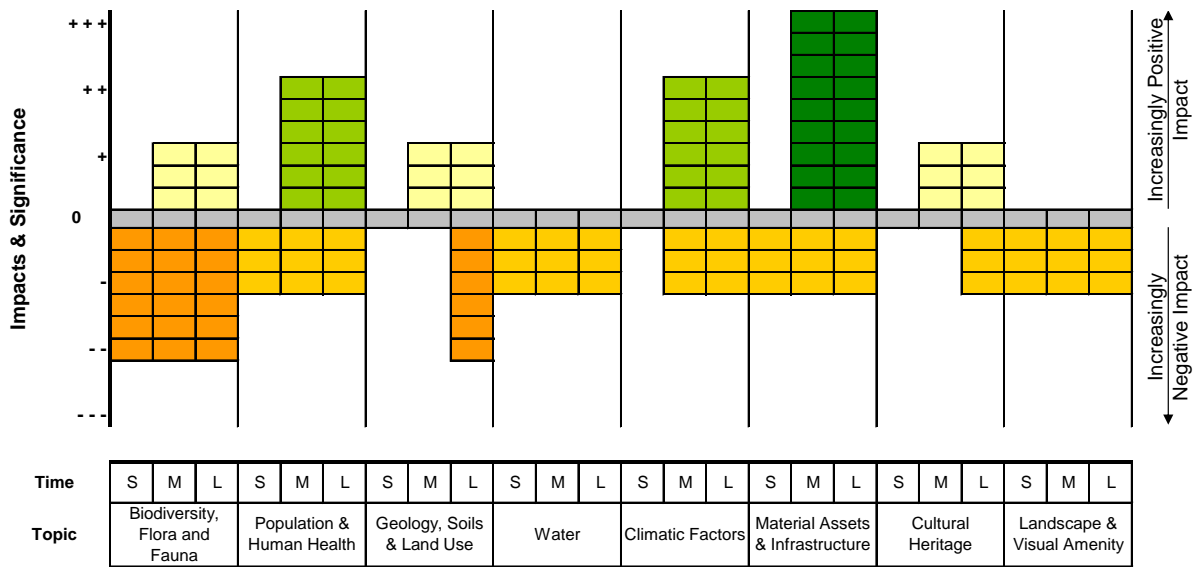
Some sections of the raised beach have come under pressure as towns such as Girvan have expanded out of their valley locations, and housing or other types of development have spread along the coastal strip. Nevertheless, settlements within this sub-cell are often small and functional with the southern section of raised beach being relatively remote. One exception to this rule is Carleton, near Lendalfoot, where a line of wooden houses creates an informal settlement on the site of a former fishery.

The on-going programme of road improvements in the area has had a significant impact upon the landscape; particularly along the A77 between Girvan and Ballantrae. Here, the road runs along the narrow raised beach at the foot of the hard volcanic cliffs. Over the years, the road has been upgraded and straightened. This has involved the creation of new rock cuttings and the loss of small headlands and other important local features. Old sections of road remain as lay-bys and picnic areas.

Large parts of the former cliffline are characterised by dense, often wind sheared broadleaf woodland. While much of this is semi-natural in origin, some is associated with designed landscapes and large estates. In some of the more exposed sections of raised beach (e.g. north of Girvan) these woodlands give way to areas of scrub, often dominated by gorse.

A small section of the coast north of Lendalfoot is designated as the Western Southern Uplands Environmentally Sensitive Area (ESA).

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-2 / 1	-2 / 1
Population & Human Health (PHH)	-1	-1 / 2	-1 / 2
Geology, Soils and Landuse (S)	0	1	-2 / 1
Water (W)	-1	-1	-1
Climatic Factors (C)	0	-1 / 2	-1 / 2
Material Assets & Infrastructure (MA)	-1	-1 / 3	-1 / 3
Cultural, Architectural & Archaeological Heritage (H)	0	1	-1 / 1
Landscape & Visual Amenity (L)	-1	-1	-1

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in part of this sub-cell (and Hold the Line/Managed Realignment in the medium/long term in policy unit 6C6.3) has the potential for short to long term, moderate, negative impacts on one European site from construction or rehabilitation of hard defences. There is also potential for slight, positive impacts on local habitats and species through habitat creation.

No significant impacts are expected on the River Bladnoch SAC, owing to distance, or on Glen App and Galloway Moors SPA, as hen harrier have no requirement for intertidal or shoreline habitats and thus any shoreline management measures will be at a greater distance than the maximum indicated for disturbance of the species. The site boundary of Lendalfoot Hills Complex SAC occurs in close proximity to the coastline north of Lendalfoot. However, there is no potential for direct impacts on this site, designated for its upland and grassland habitats, as a road separates the coastline from the site,

and the footprint of shoreline management defences will not be located within the SAC. Should Managed Realignment be necessary in policy unit 6C6.3 in the medium/long term, this could lead to knock-on effects if it becomes necessary for the road to be relocated. Careful planning of any future road relocation scheme should ensure that no significant effects occur on this site.

Ailsa Craig SPA is designated for breeding gannet, guillemot, herring gull, kittiwake and lesser black-backed gull. There is potential for short, medium and long-term, negative impacts on the conservation objectives of this site from construction or rehabilitation of hard defences, should protected seabird populations of the SPA be using the area where measures will be implemented. There is potential for short term, moderate, negative impacts through construction-phase disturbance of these species, and potential long term, moderate, negative impacts through a loss of some intertidal habitat through coastal squeeze. It should be possible to mitigate for disturbance with good timing of works, and for coastal squeeze through sensitive planning and design of shoreline protection measures.

There is no potential for impacts on the majority of SSSIs in the vicinity of this sub-cell owing to the nature of designated features (e.g. geological formations, upland terrestrial habitats). There is no potential for impacts on Turnberry Dunes SSSI, owing to the proposed policy of No Active Intervention within policy unit 6c6.1. The site boundary of Bennane Head Grassland SSSI occurs in close proximity to the coastline immediately to the north of Bennane Head. However, there is no potential for direct impacts on this site, designated for lowland grassland habitat and green-winged orchid, as a road separates the coastline from the site, and the footprint of shoreline management defences will not be located within the SSSI. Should Managed Realignment be necessary within policy unit 6C6.3 in the medium/long term, this could lead to knock-on effects if it becomes necessary for the road to be relocated. Careful planning of any future road relocation scheme should ensure that no significant effects occur from the development. Habitat may be lost should Managed Realignment be necessary in policy unit 6C6.3 in the medium/long term, however this will be a result of natural coastal processes. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

There is potential for short term, slight, negative impacts through direct temporary loss of local undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as short-beaked common dolphin, porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works.

Population & Human Health - During the implementation/rehabilitation of hard defences or beach re-nourishment, there is the potential for temporary, slight, negative impacts upon the local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc., mainly in Girvan. Re-nourishment works may also have intermittent, slight, negative disturbance impacts in the medium and long term as material needs augmented from time to time. If the A77 road requires Managed Realignment in the future due to the management policy, this may lead to medium and long term, slight, negative disturbance and disruption impacts, as there are limited diversion routes available in the area. Consideration should be given to this issue, and to the adverse impacts it might have upon emergency services, during detailed design.

In the medium to long term there is the potential for slight, negative impacts as one residential property in Dipple may not be protected by the policy. There is also the potential for moderate, positive impacts as several residential properties in Girvan will be protected from coastal flood risk with this policy.

Geology, Soils & Landuse – No Active Intervention is unlikely to have any significant, negative impacts on soil, geology or land use in the north of the sub-cell in the short, medium or long term. Holding the line at Girvan for coastal flood risk, and at Woodland for coastal erosion, is likely to give

some slight positive impacts in the medium and long term from protection of soil resource and existing land use. However, potential long term Managed Realignment to allow the coastline to naturally erode at Woodland, and realigning the A77, will have direct, slight, negative impacts on local soil and land resource. The realignment of the A77 will potentially have knock on indirect, negative, long term impacts from loss of additional soil, land use and geological resource, where the road is re-routed to. The scale of these impacts is dependent on the future routing of the road. If well planned and well carried out, the potential medium and long term re-use of Girvan harbour dredging material for local beach re-nourishment within the sub-cell would be a good, sustainable use of the material, provided it is of sufficient quality.

Water - No Active Intervention is unlikely to have any significant, negative impacts on water quality in the north of the sub-cell in the short, medium or long term. There is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures at Girvan and Woodland. These impacts are likely to occur intermittently as maintenance of the measures and potential re-nourishment continues into the medium and long term. There are no sensitive or protected waterbodies within this sub-cell. Good planning of works, timing of works and good site practices should be able to minimise the potential for negative impacts on water quality.

Climatic Factors - The proposed policy of Hold the Line at Girvan and Woodland allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional six residential properties and nine non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, moderate, positive impacts by way of managing increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation. However, the soft engineering measures that could be implemented could lead to the colonisation and establishment of more GHG sequestering vegetation.

The proposed policy of No Active Intervention within policy unit 6C6.1 does not allow for planning for climate change, however there are very few additional properties at risk. This could still give direct, slight, negative impacts in the medium and long term. Although the shoreline management policy does not protect some receptors, their risk from coastal flooding could still be managed on an individual basis, e.g. through individual property protection not associated with a shoreline management scheme.

Managed Realignment of the shoreline at Woodlands in the long term, may lead to the direct loss of GHG sequestering vegetation. Similarly, if the A77 were to be realigned, there is the potential long term loss of more vegetation due to construction of a new road further inland. Any infrastructure realignment should be well planned and designed to avoid, minimise or mitigate for any potential negative impacts on the wider environment.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works. In the medium to long term, over 10 non-residential properties, as well as a proportion of A road and minor road, will directly benefit from the implementation of proposed policy through protection from coastal flood risk, which should provide for direct, significant, positive impacts in the medium and long term.

Within policy unit 6C6.1, a small proportion of A road will continue to be subject to flood risk in the short, medium and long term; as would be the case should no policy be applied. It is thus likely that proposed policy within this unit will have slight negative, short, medium and long term impacts upon local material assets and infrastructure.

In the medium and long term, a proportion of the A77 will directly benefit from the implementation of either of the proposed policies within this unit. Such is likely to have significant, positive, medium to long term impacts upon material assets and infrastructure. No other material assets or infrastructure are likely to be at risk of coastal flooding or erosion following the implementation of proposed policy. Any infrastructure realignment should be well planned and designed to avoid, minimise or mitigate for any potential negative impacts on the wider environment.

Cultural, Architectural & Archaeological Heritage - Within the north of the sub-cell, the policy of No Active Intervention is unlikely to have any significant, negative impacts on heritage features in the short, medium to long term, as there are no known features at risk of coastal flooding or erosion. Implementation of the Hold the Line policy in Girvan is unlikely to have any short, medium or long term impacts on known heritage features. Within policy unit 6C6.3, there is potential for the medium and long term protection of a listed building at Woodland from holding the line in this area, resulting in slight, positive impacts. However, if the policy is for Managed Realignment, the building may be indirectly at risk of future coastal erosion, which would result in slight, negative impacts in the long term. It is also noted that there is a category B listed Memorial Stone at Lendalfoot (LB1059) which lies on the coastal side of the A77, however there are no assets at risk in this specific area and therefore there are unlikely to be any management works in the area to impact on the feature.

Landscape & Visual Amenity - In the north of the sub-cell, the policy of No Active Intervention is unlikely to have any significant, negative impacts on landscape and visual amenity in the short, medium to long term. At Girvan and Woodland, the localised visual imposition of construction and maintenance activities is likely to have short term, slight, negative impacts on local receptors that are being protected. The visual impacts of the extension of defences and/or Managed Realignment may also have slight, negative impacts on local views in the medium and long term. All works should be adequately screened to minimise any potential construction phase visual impacts and designs should be in line with the aesthetics of the local architecture and scenery.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include river channels at Girvan, Mill Burn and Lendalfoot. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within sub-cell 6C6 has the potential for short to long term, moderate, negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Ailsa Craig SPA that could be using the area where measures will be implemented. There is the potential for short to long term, slight, negative impacts on people, water, material assets and infrastructure, and landscape and visual amenity from recurring, localised shoreline management works. There is also the potential for slight, negative impacts in the medium to long term on climatic factors and heritage features from the No Active Intervention and Manged Realignment policies. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, climatic factors, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and from the potential for localised creation of new habitats.

7.10 SUB-CELL 6D1

Sub-cell	6D1
Local Authorities	South Ayrshire Council
Sub-cell Information	
This sub-cell extends from Bennane Head to Finnarts Point, is approximately 23km (including the inlet at the River Stinchar) and is located entirely within the South Ayrshire Council area. There are two policy units within this sub-cell.	
6D1.1 – Bennane Head to Ballantrae – Hold the line/Managed Realignment	

6D1.2 – South Ballantrae to Currarie Port – No Active Intervention.

Key Plan Issues

6D1.1 – Isolated area of coastal flood risk affecting one non-residential property and the A77 to the southern extent of Ballantrae. A significant section of the A77 was found to be at risk due to coastal erosion north of Ballantrae. The A77 is managed by Transport Scotland.

6D1.2 – No assets have been identified to be at risk due to coastal flooding and erosion in this policy unit.

Key Environmental Issues

Biodiversity, Flora and Fauna – There are two SACs and two SPAs in the vicinity of this sub-cell; Lendalfoot Hills Complex SAC, designated for fen, grassland and heathland habitats; River Bladnoch SAC, designated for Atlantic salmon, Ailsa Craig SPA, designated for breeding seabird populations; and Glen App and Galloway Moors SPA, designated for breeding hen harrier.

There are six SSSIs located within or adjacent to this sub-cell; Girvan to Ballantrae Coast Section, designated for its geological formations; Littleton and Balhammie Hills, designated for upland grassland and fen; Bennane Head Grassland, designated for lowland grassland and green-winged orchid; Glen App and Galloway Moors, designated for breeding hen harrier, Sgavoch SSSI, designated for its geological formations and the Ballantrae Shingle SSSI, designated for its shingle and associated vegetation.

The marine species of harbour porpoise, short-beaked common dolphin, porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Several salmonid rivers occur within this sub-cell.

Population & Human Health – This sub-cell is relatively sparsely populated, with the main settlement being Ballantrae. There is no risk to residential properties from coastal flooding or erosion in the 200 year scenario within this sub-cell.

In South Ayrshire, 51% of residents are considered to be in ‘very good’ health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in ‘very bad’ health, which is the same as than the national average.

Geology, Soils and Landuse – Mineral gleys derived from basaltic rock dominate the hard rocky coastline to the north of this sub-cell, whilst brown soils of lower Palaeozoic grey wacke and shale can be found on the undulating lowlands in the south. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Mixed Agriculture’.

Sandstone, breccia and conglomerate sedimentary rock comprise the bedrock in the north of this sub-cell. Undifferentiated Cambrian and Ordovician mafic lava and mafic tuff dominate the bedrock to the south, with wacke making up the bedrock further south still. The seabed is comprised of infralittoral sand and rock.

The land of the coastal town of Ballantrae is largely used for residential purposes as well as community facilities, open space and conservation. To the south of Ballantrae, the southern aspect

of this sub-cell is designated as the Western Southern Uplands ESA.

Water – This sub-cell is part of the Scottish and Solway Tweed River Basin Districts. The shoreline of this sub-cell constitutes part of the Ballantrae and Loch Ryan Offshore Coastal Water Bodies. Each of these waterbodies has an overall status of Good with Medium confidence. They have an ecological status of Good and an overall chemical status of Pass. There are three transitional water bodies within this sub-cell, these are; the Stinchar Estuary, the Ballantrae Lagoon North and the Ballantrae Lagoon South. These are classified as having an overall status of High with Medium confidence, an overall ecological status of High and an overall chemical status of Pass.

Climatic Factors – There are no residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell. There is one non-residential property at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The A77 is the only principle road within this sub-cell. The Moyle Interconnector North and Moyle Interconnector South power cables are present within this sub-cell.

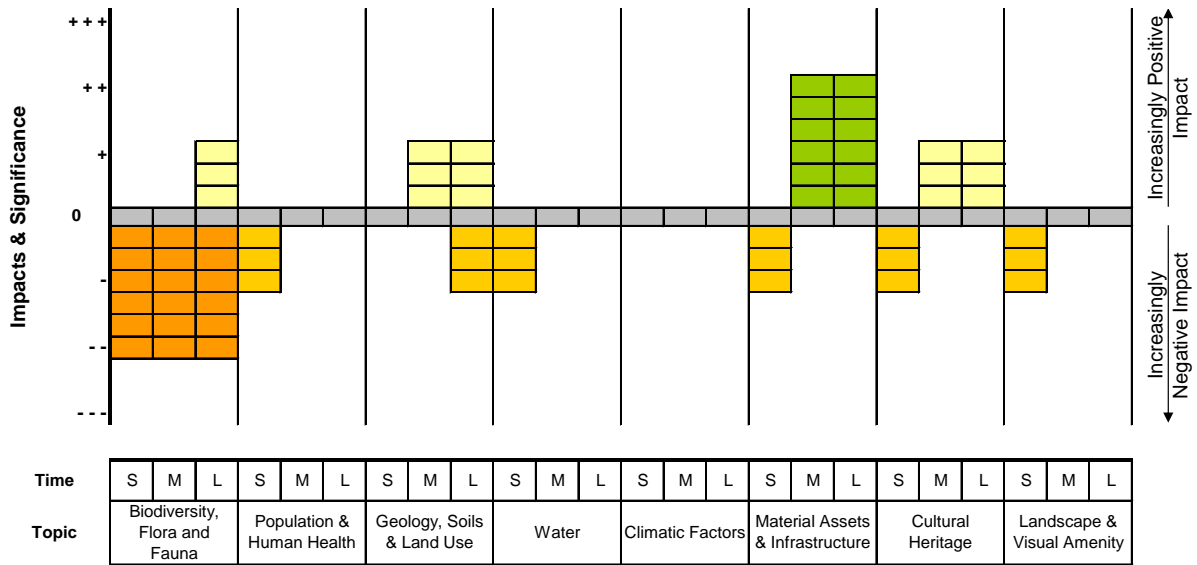
In the 200 year scenario it is anticipated that there is one non-residential property at risk of coastal flooding. A very small proportion of A road is also at risk. There are no non-residential properties at risk of coastal erosion within this sub-cell. There are no roads which are directly at risk of erosion either; however a small proportion of A road runs within the influence and/or vicinity of such erosion.

Cultural, Architectural & Archaeological Heritage – Within this sub-cell there are 11 listed buildings, seven scheduled monuments and two Conservation Areas. The land associated with Glenapp Castle is a designated garden and there are several Canmore Sites, such as the landing point at Bennane and the harbour pier in Ballantrae, within this sub-cell.

There are a large number of vessels presumed to have been lost within this sub-cell along with a number of wrecks, such as the Arla, which have been found.

Landscape & Visual Amenity – This aspect of the Ayrshire coastline is defined by its raised beaches. For the most part, the raised beach has been carved into comparatively soft red sandstone. This has created level terraces 100 to 300 metres wide and backed by a steep, fairly smooth escarpment. This type of land is largely used for farming within Ayrshire, though here in the south of Ayrshire the coast is more exposed and the cliffline is either unvegetated or colonised by rough grasslands or gorse. Not far south of Ballantrae, in policy unit 6D1.2, the southern aspect of this sub-cell is designated as the Western Southern Uplands ESA.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-2	-2 / 1
Population & Human Health (PHH)	-1	0	0
Geology, Soils and Landuse (S)	0	1	-1 / 1
Water (W)	-1	0	0
Climatic Factors (C)	0	0	0
Material Assets & Infrastructure (MA)	-1	2	2
Cultural, Architectural & Archaeological Heritage (H)	-1	1	1
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in the northern section of this sub-cell has the potential for short to long term, moderate, negative impacts on a European site, as well as the potential for long term, slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on Lendalfoot Hills Complex SAC as there is no pathway by which impacts could occur on designated habitats from implementation of shoreline management measures within this sub-cell. No significant impacts are expected on the River Bladnoch SAC, owing to distance, or on Glen App and Galloway Moors SPA, as hen harrier have no requirement for intertidal or shoreline habitats and any shoreline management measures will be at a greater distance than the maximum indicated for disturbance of the species. Ailsa Craig SPA is designated for breeding gannet, guillemot, herring gull, kittiwake and lesser black-backed gull. There is potential for short to

long term, moderate, negative impacts on the conservation objectives of this site from construction or rehabilitation of hard defences, should protected seabird populations of the SPA be using the area where measures will be implemented. There is potential for short term, moderate, negative impacts through construction-phase disturbance of these species, and for long term, moderate, negative impacts through a loss of some intertidal habitat through coastal squeeze. It should be possible to mitigate for disturbance with good timing of works, and for coastal squeeze through sensitive planning and design of shoreline protection measures.

There is no potential for impacts on any SSSI in the vicinity of this sub-cell, owing to the nature of designated features (e.g. geological formations, upland terrestrial habitats), or distance from the coastline and distance from any proposed active management measures.

There is potential for short term, slight, negative impacts through direct temporary local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as harbour porpoise, short-beaked common dolphin, porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase or maintenance impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. Additional undesignated terrestrial habitat may be lost should Managed Realignment be necessary in policy unit 6C6.3 in the medium/long term, however this will be a result of natural coastal processes. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as dune stabilisation or nourishment be used in certain locations, these have the potential for long term, slight, positive impacts, through creation of habitat for local flora and fauna.

Population & Human Health - As this sub-cell is relatively sparsely populated, there are unlikely to be significant impacts upon population and human health as a result of the proposed policy. Nevertheless, given the proximity of defences to the A77, as well as the possibility of its Managed Realignment, there is potential for temporary, slight, negative impacts upon the local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access.

Geology, Soils & Landuse - There are unlikely to be significant, short term impacts upon local soils, geology and land use as a result of the proposed policy at Ballantrae. In the medium to long term, the potential protection of local soils, geology and lands from the risk of coastal erosion would provide for direct, slight, positive impacts.

Potential long term Managed Realignment to allow the coastline to naturally erode and realigning the A77 will have direct, slight negative impacts on local soil and land resources. The realignment of the A77 will potentially have knock on indirect, negative, long term impacts from loss of additional soil, land use and geological resources, where the road is re-routed to. The scale of these impacts is dependent on the future routing of the road.

Water – No Active Intervention is unlikely to have any significant, negative impacts on water quality in the south of the sub-cell in the short, medium or long term. There is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of measures to hold the line at Ballantrae and the A77. There are no sensitive or protected waterbodies within this sub-cell. Good planning of works, timing of works and good site practices should be able to minimise the potential for negative impacts on water quality.

Climatic Factors - The proposed policy of Hold the Line at Ballantrae allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. There

are, however no additional residential or non-residential properties at risk of climate change influenced flooding, over the current 1:200 year scenario. There are small sections of additional road at risk of coastal flooding under the climate change scenario; however the overall risk is still low.

Material Assets & Infrastructure - During the construction phase of implementing the proposed policy measure there is potential for direct and indirect, temporary, slight, negative disturbance impacts upon local businesses and road infrastructure. Disturbance impacts can be minimised with good planning, timing and management of any construction works. In the medium to long term, one non-residential property, as well as the A77 road and some minor roads, will directly benefit from the implementation of proposed policy through protection from coastal flood risk and also erosion, which should provide for direct, moderate, positive impacts in the medium and long term. Any infrastructure realignment should be well planned and designed to avoid, minimise or mitigate for any potential negative impacts on the wider environment.

Cultural, Architectural & Archaeological Heritage – Any construction or maintenance works in the vicinity of the Ballantrae Conservation Areas have the potential for short term, slight, negative impacts on the setting of these areas. In the medium to long term, the Hold the Line policy may provide protection from erosion to part of the Ballantrae Conservation Area near Park End.

Managed Realignment of the shoreline, in the vicinity of the A77 north of Ballantrae, is unlikely to impact upon known heritage features in the area, provided the road is not re-routed near or through an area of high heritage value.

Landscape & Visual Amenity - In the south of the sub-cell the policy of No Active Intervention is unlikely to have any significant, negative impacts on landscape and visual amenity in the short, medium to long term. At Ballantrae, the localised visual imposition of construction and maintenance activities is likely to have short term, slight, negative impacts on local receptors. All works should be adequately screened to minimise any potential construction phase visual impacts, and designs should be in line with the aesthetics of the local architecture and scenery.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination

effects with the Ayrshire SMP are anticipated.

- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the river channel at Ballantrae. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within sub-cell 6D1 has the potential for short to long term, moderate, negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Ailsa Craig SPA that could be using the area where measures will be implemented. There is the potential for slight, negative impacts on soils and land use in the long term from the potential realignment of the A77. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, water quality, material assets and infrastructure, heritage features, and landscape and visual amenity. There is the potential for medium to long term, slight to moderate, positive impacts on soils, land use, material assets and infrastructure, heritage and biodiversity, flora and fauna. These impacts are from protecting features and assets from the current day flood and erosion risk and future predicted risk, and from the potential for localised creation of new habitats.

7.11 SUB-CELL 6D2

Sub-cell	6D2
Local Authorities	South Ayrshire Council/Dumfries and Galloway Council
Sub-cell Information	
This sub-cell extends from Finnarts Point to Milleur Point, is approximately 42km in length, of which approximately 7.5km is located within the South Ayrshire Council area. The remaining shoreline within this sub-cell is located in the Dumfries and Galloway Council area. There is only one policy unit within this sub-cell.	
6D2.1 – Currarie Port to Galloway Burn – No Active Intervention.	
Key Plan Issues	
6D2.1 – Isolated area of coastal flood risk at Finnarts Bay. No assets have been identified as being at risk due to erosion.	

Key Environmental Issues

Biodiversity, Flora and Fauna – There are six SACs and two SPAs in the vicinity of this sub-cell; Flow of Dergoals SAC, designated for blanket bog and depressions on peat substrates; Kilhern Moss SAC, designated for blanket bog and depressions on peat substrates; Kirkcowan Flow SAC designated for blanket bog and depressions on peat substrates; Lendalfoot Hills Complex SAC designated for fen, grassland and heathland habitats; Luce Bay and Sands SAC, designated for coastal dune heathland, dune grassland, great crested newt, intertidal mudflats and sandflats, reefs, shallow inlets and bays, shifting dunes, shifting dunes with marram, and subtidal sandbanks; River Bladnoch SAC, designated for Atlantic salmon; Glen App and Galloway Moors SPA, designated for breeding hen harrier; and Loch of Inch and Torrs Warren SPA, designated for Greenland white-fronted goose and hen harrier.

There are two SSSIs located within or adjacent to this sub-cell; Corsewall Point to Milleur Point, designated for geological formations; and Glen App and Galloway Moors, designated for breeding hen harrier.

The Loch Ryan MCA is located within this sub-cell, and supports marine species such as harbour porpoise, white-beaked dolphin, short-beaked common dolphin, porbeagle shark, spiny dogfish, sandy ray and blue shark. Several salmonid rivers are situated within this sub-cell, and there are designated shellfish growing waters.

The invasive non-native brown alga *Sargassum* is known to occur in this area of the Ayrshire coastline.

Population & Human Health – This sub-cell is relatively sparsely populated, with no coastal flood or erosion risk to residential properties within policy unit 6D2.1.

In South Ayrshire, 51% of residents are considered to be in 'very good' health, which is close to the national average of 52% for Scotland, while 1% of the local residents are considered to be in 'very bad' health, which is the same as than the national average.

Geology, Soils and Landuse – The soil along this rocky, hard coastline is principally composed of alluvial soils of recent riverine and lacustrine alluvial deposits making up the floodplains, river terraces and former lakebeds of the area. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Improved Grassland', 'Land capable of supporting Arable Agriculture' and 'Land capable of supporting Mixed Agriculture'.

The bedrock is composed largely of wacke and sandstone, breccia and conglomerate sedimentary rock. The seabed is comprised of infralittoral and shallow circalittoral sand.

The northern coastline of Loch Ryan to south of Innermessan is designated as the Western Southern Upland ESA.

Water – Sub-cell 6D2 is part of the Solway Tweed River Basin District. The shoreline of this sub-cell constitutes part of the Loch Ryan Coastal Water Body. It has an overall status of Moderate with High confidence, and overall ecological status of Moderate and an overall chemical status of Pass. The Loch Ryan Shellfish Water protected area is within this sub-cell.

Climatic Factors – There are no additional residential or non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The principle roads within this sub-cell are the A77, the A718, the A75, the A751 and the A717. There is also one section of railway within this area. None of these

assets are at risk of coastal flooding or erosion within the sub-cell.

Cultural, Architectural & Archaeological Heritage – There are 31 scheduled monuments and two Conservation Areas within this sub-cell. There are also several Canmore Sites, including landing points at Portandea and Port Sally as well as a fort at Finnarts Point.

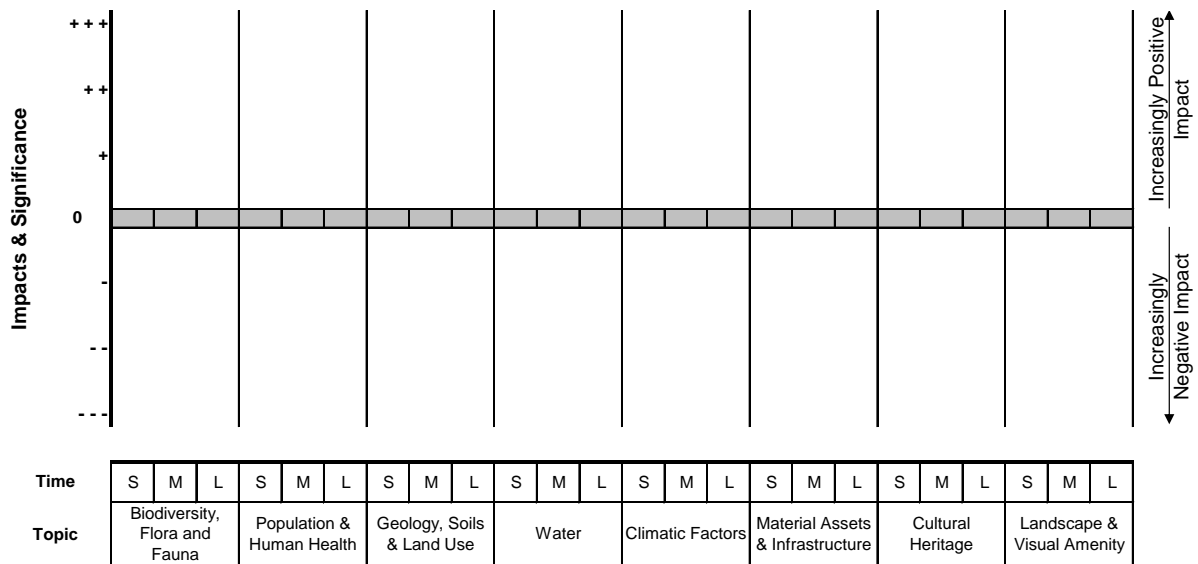
There are a number of vessels presumed to be lost within this area and a number of wrecks which have been found also.

Landscape & Visual Amenity – This aspect of the Ayrshire coastline is defined by its raised beaches. For the most part, the raised beach has been carved into comparatively soft red sandstone, creating a level terrace 100 to 300 metres wide and backed by a steep, fairly smooth escarpment.

This type of land is largely used for farming within Ayrshire, though here in the south of Ayrshire the coast is more exposed and the cliffline is either unvegetated or colonised by rough grasslands or gorse.

The northern coastline of Loch Ryan to the south of Innermessan is designated as the Western Southern Upland ESA.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	0	0	0
Geology, Soils and Landuse (S)	0	0	0
Water (W)	0	0	0
Climatic Factors (C)	0	0	0

Material Assets & Infrastructure (MA)	0	0	0
Cultural, Architectural & Archaeological Heritage (H)	0	0	0
Landscape & Visual Amenity (L)	0	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of No Active Intervention in this sub-cell has no potential for short, medium or long term, negative or positive impacts on biodiversity, flora and fauna.

There is no potential for impacts on any SAC, SPA, or SSSI in the vicinity of this sub-cell, owing to the policy of No Active Intervention. Any changes to designated habitats/species will be a result of natural change and not a result of the Shoreline Management Plan.

In addition, owing to the proposed policy of No Active Intervention, there is no potential for disturbance or displacement of local habitats and/or species or for the spread of the invasive alga *Sargassum* in this sub-cell as a result of the Shoreline Management Plan.

Population & Human Health - Within policy unit 6D2.1, there are unlikely to be any significant positive or negative, direct or indirect impacts upon local population and human health in the short, medium and long term, as a result of proposed policy within this unit. This is because there are no residential properties which have been determined as being at risk of coastal flooding and/or erosion.

Geology, Soils & Landuse - There are unlikely to be any significant impacts upon local soils, geology or land use in the short, medium or long term as a result of the implementation of proposed policy within unit 6D2.1. No erosion has been identified within the sub-cell.

Water - There are unlikely to be significant positive or negative, direct or indirect impacts upon water quality in the short, medium and long term as a result of the implementation of proposed policy within this sub-cell.

Climatic Factors – Although this policy does not provide for adaptation to climatic change there are no receptors within the sub-cell potentially at risk of climate change influenced flooding or erosion.

Material Assets & Infrastructure - In the short, medium and long term, one abandoned non-residential property will continue to be subject to flood risk at Finnarts Bay; as would be the case should no policy be applied. The implementation of proposed policy within this sub-cell is thus likely to have neutral, medium to long term impacts upon local material assets and infrastructure.

Cultural, Architectural & Archaeological Heritage - There are unlikely to be significant impacts upon local cultural, architectural and archaeological heritage as a result of proposed policy in the short, medium and long term, within this sub-cell as there are no heritage features at risk of flooding or erosion.

Landscape & Visual Amenity - There are unlikely to be any direct or indirect impacts upon local landscape and visual amenity within this sub-cell as a result of proposed policy in the short, medium and long term.

Potential sources of in-combination effects identified as part of this assessment include:

- As the policy in this sub-cell is for No Active Intervention, there is no capacity for in-combination effects.

Key Conclusions:

Implementing the No Active Intervention policy within sub-cell 6D2 is unlikely to have any impacts on any environmental topic areas in the short, medium and long term. No properties or assets are at risk of coastal flood risk or erosion in the sub-cell.

7.12 SUB-CELL A1

Sub-cell	A1
Local Authorities	North Ayrshire Council
Sub-cell Information	
<p>This sub-cell encompasses the north eastern section of the Isle of Arran and extends from Lochranza to Clauchlands Point and includes the communities of Lochranza, Sannox, Corrie and Brodick. This section of shoreline is approximately 41km in length and is located within the North Ayrshire Council area. There are five policy units within this study area.</p>	
A1.1 – Lochranza – Hold the line.	
A1.2 – Lochranza to Sannox – No Active Intervention.	
A1.3 – Sannox to Brodick – Hold the line/Managed Realignment.	
A1.4 – Brodick – Hold the line.	
A1.5 – Brodick to Clauchlands Point – No Active Intervention.	
Key Plan Issues	
<p>A1.1 – Significant area of flood risk around Newton Road affecting residential properties and non-residential properties. A significant section of the A841 is at risk of coastal flooding. Fluvial, pluvial and groundwater flooding risk present also. No assets were found to be at risk due to coastal erosion.</p>	
<p>A1.2 – No assets were found to be at risk due to coastal flooding or erosion.</p>	
<p>A1.3 – Isolated coastal flood risk affecting two residential properties at Sannox Bay. Isolated sections of the A841 were also found to be at risk of coastal flooding. No assets were found to be at risk due to coastal erosion.</p>	
<p>A1.4 – Significant coastal flood risk is in the vicinity of the bowling green, with other isolated area of flood risk along the A841. The A841 road is at significant coastal flood risk. A significant number of properties are at risk due to coastal erosion also. A landfill site to the south of the policy unit is at risk of erosion and requires protection.</p>	
<p>A1.5 – No assets have been identified as being at risk due to coastal flooding or erosion in this policy unit.</p>	

Key Environmental Issues

Biodiversity, Flora and Fauna – There is one SAC and two SPAs in the vicinity of this sub-cell; Tarbert Woods SAC, designated for western acidic oak woodland; Arran Moors SPA designated for breeding hen harrier; and Kintyre Goose Roosts SPA, designated for Greenland white-fronted goose.

There are seven SSSIs located within or adjacent to this sub-cell; Arran Northern Mountains, designated for geological formations, upland habitats, and associated species; the Arran Moors, designated for upland habitats, hen harrier and breeding bird assemblages; North Newton Shore designated for geological formations; Laggan, designated for palaeobotanical features; Corrie Foreshore and Limestone Mines, designated for geological formations; Gleann Dubh, designated for upland habitats and breeding bird assemblages; and Clauchlands Point to Corrygills, designated for geological formations, maritime cliffs, saltmarsh, and upland mixed ash woodland.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Several salmonid rivers occur within this sub-cell.

The invasive non-native brown alga Sargassum is known to occur in this area of the Ayrshire coastline.

Population & Human Health – The main settlements in this sub-cell are at Brodick and Lochranza. In the 200 year coastal flood risk scenario there are almost 20 residential properties at risk, which is over 35 people. Within policy units A1.2 and A1.5 there is no significant flood risk present to people or property. There are no persons at risk due to coastal erosion within this sub-cell.

In North Ayrshire, 49% of residents are considered to be in 'very good' health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in 'very bad' health, which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – The soft sediment coastline of this sub-cell is composed primarily of brown soils and mineral podzols. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Improved Grassland'.

The more northern coastal bedrock is comprised of sandstone, breccia and conglomerate with some sedimentary rock cycles. Further south, the bedrock is made up of sandstone, siltstone and mudstone with interbedded sandstone and conglomerate. To the far south, sandstone, breccia and conglomerate define the bedrock along with unnamed igneous intrusion and sedimentary rock cycles. The seabed is comprised of deep circalittoral sand and mud, infralittoral rock and deep and shallow circalittoral rock or other strata.

The land in this sub-cell is largely divided between three principle settlements; Corrie, Lochranza and Brodick. Each of these is used predominantly for housing and open space however land use at Brodick is also used for business and industry, mainly in relation to the ferry port.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Sound of Bute and the East Arran Coastal Water Bodies. Both of these waterbodies have an overall status of Moderate with High confidence. Similarly, they both have an overall ecological status of Moderate and an overall chemical status of Pass.

Climatic Factors – There are over 45 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is almost 100 people; over 60 more people than are at risk from the current day 1:200 year event. There are also almost 30 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The A841 is the only principle road within this sub-cell. The sub-sea telecommunications cable BT-HIE Seg 1.6, runs from Ardneil, on the mainland, to Corrie. Brodick Port and the port of Lochranza are situated within this sub-cell.

The risk of coastal flooding to material assets is present within this sub-cell. In the 200 year scenario there are over 20 non-residential properties at risk. There is also a portion of A road at risk of coastal flooding. There is no direct risk to non-residential properties from predicted coastal erosion, however a small number of properties are within the zone of influence (10m) and/or vicinity (60m) of coastal erosion which may therefore be subject to its affects to some small extent. There are no roads which are anticipated to be at risk of coastal erosion scenario within this sub-cell.

Cultural, Architectural & Archaeological Heritage – There are 73 listed buildings and 13 scheduled monuments within this sub-cell. There are also two Conservation areas, one of which is situated in Corrie and is at risk of coastal flooding. The lands associated with Brodick Castle, (spanning policy units A1.3 and A1.4) are the only designated gardens here, though the castle itself is one of several Canmore Sites. The castle at Lochranza is the only Property in Care within this sub-cell, though there are two National Trust for Scotland Sites; Goatfell and Brodick Castle and Country Park.

A number of vessels are presumed to have been lost, and a number of wrecks found, within this area. The HMS Dasher, a Control Site designated under the Protection of Military Remains Act 1986, is located here between this sub-cell and sub-cell 6C1.

Landscape & Visual Amenity – North Arran is a Special Landscape Area and a National Scenic Area, encompassing most of the sub-cell.

The landscape of this sub-cell varies significantly. Raised beaches are prominent on the coast between Brodick and the Cock of Arran. These beaches and the old cliff lines are cut into a range of different rock types including red sandstones, schists and carboniferous rocks. The schists create a folded coastal landscape of crags and cliffs; many of which remain as craggy escarpment or are clothed in rich, but dramatically wind-sheared broadleaf woodland.

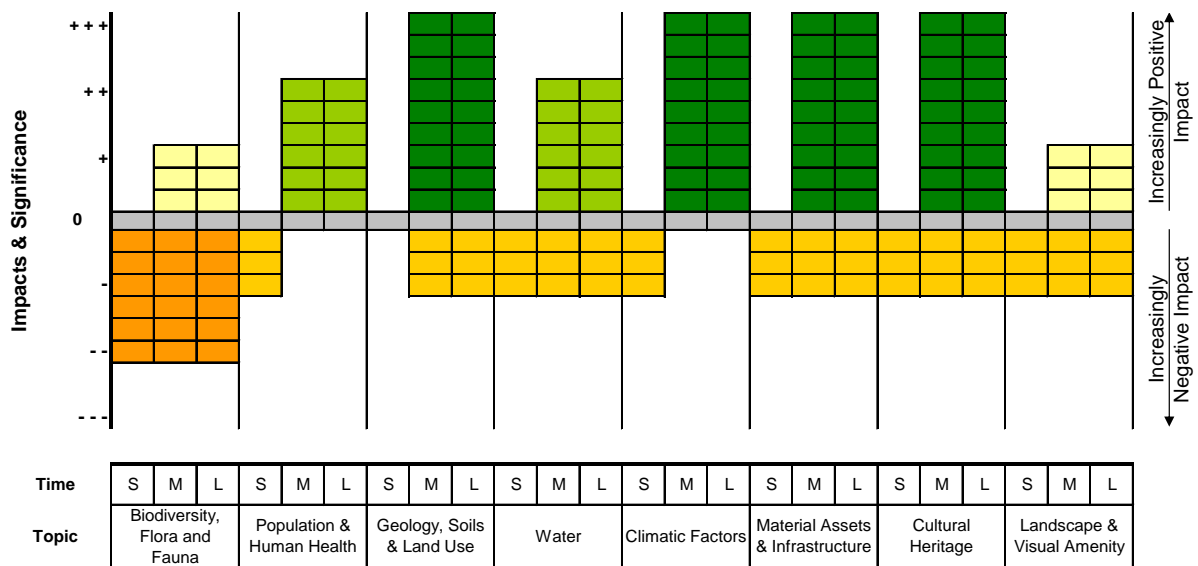
The beaches broaden into wider bays where valleys reach the coast, thereby providing a focus for larger settlements such as Brodick, whilst the raised areas are characterised by narrow, linear villages such as Corrie.

The distinctive headland to the very north of this sub-cell is elongated with a very steep northern face and shallower south facing slopes. Although the south-easternmost part has been forested, much remains under heather or rough grassland. The settlement of Lochranza is situated around a sheltered natural harbour at the western end of the Cock of Arran. This dispersed village includes a tower house, a scatter of traditional cottages and the more recent distillery development.

The coastal headlands tend to have a pattern of agriculture which reflects the combined influence of exposure, gradient and soil quality. Hedge fields on the lower slopes typically give way to rougher, unenclosed summits. In places, the contraction of farming is evident in the abandonment of higher enclosures and the presence of outgrown beech hedges.

The Forestry Commission holds the deeds to a number of woodland areas within this sub-cell including the Clauchlands, the Sannox Estate and Corriegills Farm.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-2 / 1	-2 / 1
Population & Human Health (PHH)	-1	2	2
Geology, Soils and Landuse (S)	0	-1 / 3	-1 / 3
Water (W)	-1	-1 / 2	-1 / 2
Climatic Factors (C)	-1	3	3
Material Assets & Infrastructure (MA)	-1	-1 / 3	-1 / 3
Cultural, Architectural & Archaeological Heritage (H)	-1	-1 / 3	-1 / 3
Landscape & Visual Amenity (L)	-1	-1 / 1	-1 / 1

Discussion of Impacts

Biodiversity, Flora & Fauna - The proposed policy of Hold the Line in some policy units of this sub-cell, and Hold the Line/Managed Realignment in the medium/long-term in policy units A1.3 and A1.4, has the potential for short to long term, moderate, negative impacts on a nationally important site, and short term, slight, negative impacts on local habitats and species during construction. There is also potential for long term, slight, positive impacts on local habitats and species from habitat creation.

There is no potential for impacts on Tarbert Woods SAC as there is no identifiable pathway by which impacts could occur on designated habitats from implementation of shoreline management measures within this sub-cell. No impacts are expected on Arran Moors SAC as a result of the policy of No Active Intervention in policy unit A1.2. This is due to the lack of any requirement for intertidal or shoreline habitats by hen harrier, and because management measures will be at a greater distance than the maximum indicated for disturbance of the species. Likewise, there is no potential for impacts on the Greenland white-fronted goose population of the Kintyre Goose Roosts

SPA, owing to the lack of any requirement for intertidal or shoreline habitats by the species, and because any proposed Hold the Line shoreline management measures will be implemented at a distance greater than the maximum likely disturbance distance for the species.

There is no potential for impacts on the majority of SSSIs in the vicinity of this sub-cell, owing to the nature of designated features (e.g. geological formations, upland terrestrial habitats). There is No potential for impacts on Clachlands Point to Corrygills SSSI, owing to the proposed policy of no Active Intervention in this location. There is potential for short term, moderate, negative impacts on Arran Moors SSSI, through disturbance of protected bird species (including red-throated diver, golden eagle, peregrine and short-eared owl) as a result of the Hold the Line policy (Hold the Line/Managed Realignment in the medium/long term) in policy unit A1.3. It should be possible to mitigate for disturbance with good timing of works and good working practices. The site boundary of Arran Northern Mountains SSSI occurs in close proximity to the coastline in the vicinity of Lochranza. However, there is no potential for direct impacts on this site, as a road separates the coastline from the site, and the footprint of shoreline management defences will not be located within the SSSI. Should Managed Realignment be necessary in policy unit A1.3 in the medium/long term, this could lead to knock-on effects if it becomes necessary for the road to be relocated. Careful planning of any future road relocation scheme should ensure that no significant effects occur on this site.

There is potential for short term, slight, negative impacts through direct temporary local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze. There is potential for spread of the invasive alga Sargassum during construction, however this could be mitigated for with strict site practice and adherence to protocols.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long term, slight, positive impacts, through creation of habitat for local flora and fauna.

Population & Human Health – Although this sub-cell is relatively sparsely populated there is the potential for temporary, slight, negative disturbance impacts upon local populations within policy units A1.1, A1.3 and A1.4. Such impacts are likely as a result of the construction/rehabilitation of defences, the potential Managed Realignment of the A841 and the removal of fill material at Brodick. During the implementation / rehabilitation phase of hard and soft engineering measures, there is the potential for slight, temporary, direct and indirect, negative impacts upon local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc., particularly in the more built up areas of Brodick. Particular consideration should be given to the short term impacts of proposed policy upon traffic, as options to divert vehicles are limited on the island.

Should a Hold the Line policy be adopted within unit A1.3, then almost 20 residential properties (over 35 people) within this sub-cell will directly benefit from protection from coastal flooding; giving moderate, positive impacts in the medium to long term. Should Managed Realignment become the preferred medium to long term option, then around 15 residential properties (over 30 people) will be protected, however this will still provide direct, moderate, positive impacts in the medium to long term.

Geology, Soils & Landuse – Given the steep topography and limited risk of erosion and flooding to much of the sub-cell there is unlikely to be any significant impacts on soils, geology and land use.

However, in Brodick there is a significant coastal flood and erosion risk at both ends of Brodick Bay. The erosion and flood risk here has the potential to mobilise fill material of unknown quality along the shoreline. Management or removal of this risk has the potential for significant positive impacts in the medium and long term. If Managed Realignment is implemented in A1.3 then the immediate shoreline within this unit will not be protected from coastal flood risk. Subsequently, this policy is likely to have slight, negative impacts upon local soil and land resources in the medium to long term.

Water - In policy units A1.1, A1.3 and A1.4, there is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts are likely to occur intermittently as maintenance of the measures continues into the medium and long term.

Management of coastal erosion at Brodick Bay has the potential for moderate, positive impacts in the medium and long term by managing and containing the unknown and potentially contaminated materials that are at risk of erosion. Without this management of erosion these materials could be mobilised into the coastal waterbody.

Climatic Factors - The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 30 residential properties and almost ten non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation. However the soft engineering measures that could be implemented to re-establish the shoreline after management of the unknown materials at Brodick could lead to the colonisation and establishment of more GHG sequestering vegetation.

Material Assets & Infrastructure - In policy units A1.1, A1.3 and A1.4, during the construction of defences there is potential for temporary, slight, negative disturbance impacts to local road infrastructure. There is also potential for temporary, slight, negative disturbance impacts to road infrastructure should Managed Realignment be the preferred policy measure implemented in unit A1.3.

In the medium and long term, the A841 coastal road, along with over 20 non-residential properties, and golf courses at Lochranza and Brodick, will directly benefit from the implementation of proposed policies for this sub-cell. These are likely to be significant positive impacts.

Cultural, Architectural & Archaeological Heritage - In the short, medium and long term, there is potential for the visual imposition of any hard defences, and/or the potential Managed Realignment of the A841 in unit A1.3, to have slight, negative impacts upon the setting of a large number of designated heritage features within policy units A1.1, A1.3 and A1.4. In the medium to long term, these proposed measures could provide protection from flood risk and coastal erosion to a number of designated heritage sites. Such sites include Lochranza Castle (a listed building, scheduled monument and property in care), Corrie Harbour (a listed building) and Brodick Castle Gardens (a designated designed landscape). The protection of these features would give direct, significant, positive impacts in the medium and long term.

In the event that the diversion of the A841, as opposed to hard defences, is the preferred policy measure within A1.3, then there is greater potential for direct, negative impacts on heritage features along this section of shoreline and less likelihood of heritage features being provided with incidental protection.

The policy proposed for unit A1.2 will not protect the two scheduled monuments at risk of coastal flooding within the unit. This presents medium and long term, direct, slight, negative impacts.

Within A1.5, the impact of proposed policy is likely to be neutral as there are no heritage features at risk of coastal flooding or erosion.

Landscape & Visual Amenity - Within policy units A1.1, A1.3 and A1.4, the visual impact of any construction/maintenance activities is likely to have direct, slight, negative impacts upon the local landscape and local views in the short term. Despite this being a special landscape area and national scenic area there are unlikely to be any significant, negative impacts in these areas in the medium to long term, as any shoreline management works are unlikely to be intrusive in the landscape / seascape. Realignment of the A841 could however provide slight, negative impacts to local receptors in the medium and long term if the positioning of the road has to be raised and thereby becomes more prominent in the local landscape. Potential soft engineering works at Brodick Bay may improve local views to receptors in the medium to long term, with slight, positive impacts. All works should be adequately screened to minimise any potential construction phase visual impacts.

With the policy of No Active Intervention in policy units A1.2 and A1.5, there are unlikely to be any visual impacts in the short, medium and long term.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant, negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the pier and harbour area at Lochranza and Brodick, and the river channels at Lochranza, Sannox and Brodick. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within sub-cell A1 have the potential for short to long term moderate negative impacts on biodiversity, flora and fauna, due to potential impacts on protected seabird populations of the Arran Moors SSSI. There is the potential for short to long term, slight, negative impacts on people, water, material assets and infrastructure, heritage features, and landscape and visual amenity from recurring, localised shoreline management works. There is the potential for slight, negative impacts in the medium to long term on soils and land use from the Managed Realignment policy, through loss of shoreline. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on the local population. There is the potential for medium to long term, slight to significant, positive impacts on people, soils, land use, climatic factors, water quality, material assets and infrastructure, heritage, local landscape, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, as well as managing potentially contaminated materials to prevent their dispersal into the marine environment, and potentially enhancing the habitats and aesthetics of the shoreline with soft engineering works.

7.13 SUB-CELL A2

Sub-cell	A2
Local Authorities	North Ayrshire Council
Sub-cell Information	
This sub-cell extends from Clauchlands Point to Kingscross Point and includes the community of Lamlash. This section of shoreline is approximately 9km in length (excluding Holy Isle) and is located entirely within the North Ayrshire Council area. There are three policy units within this sub-cell.	
A2.1 – Clauchlands Point to Lamlash – No Active Intervention.	
A2.2 – Lamlash – Hold the line.	
A2.3 – Lamlash to Kingscross Point – No Active Intervention.	
Key Plan Issues	
A2.1 – A localised section of minor road was found to be at risk of coastal flooding close to the	

Outdoor Centre. No assets have been identified to be at risk due to coastal erosion in this policy unit.

A2.2 – Significant coastal flood risk to properties at Cuddy Dook and adjacent to the tennis courts. A significant section of minor road at Cuddy Dook is at risk of coastal flooding, as well as isolated sections of the A841. Properties and the minor road at Cuddy Dook were also found to be at risk due to coastal erosion. Scottish Water assets run along the beach and are at risk of erosion.

A2.3 – No assets have been identified as being at risk due to coastal flooding or erosion in this policy unity.

Key Environmental Issues

Biodiversity, Flora and Fauna – There is one SPA in the vicinity of this sub-cell; Arran Moors SPA, which is designated for breeding hen harrier.

There is one SSSI located within or adjacent to this sub-cell; Clauchlands Point – Corrygills, which is designated for geological formations, maritime cliffs, saltmarsh, and upland mixed ash woodland.

This section of the coast is designated under the Marine (Scotland) Act 2010 as a Marine Protected Area (MPA) and is home to populations of (Dover) sole, anglerfish, blue whiting, cod, haddock, hake, herring, horse mackerel, mackerel, porbeagle shark, spiny dogfish, sandy ray and blue shark. Several salmonid rivers occur within this sub-cell.

The invasive non-native brown alga *Sargassum* is known to occur in this area of the Ayrshire coastline.

Population & Human Health – Lamlash is the main settlement within the sub-cell, with a population of around 1030 people; equating to roughly seven people per hectare.

In the 200 year coastal flood risk scenario there are over 20 residential properties at risk, which is over 40 people. All of this risk is within the Lamlash area. Within policy units A2.1 and A2.3 there is no significant flood risk present to people or property. There are no people at risk from coastal erosion within this sub-cell; however there are four properties within the vicinity (60m) of future predicted erosion. There is also thought to be a risk of wave overtopping in the Lamlash area.

In North Ayrshire, 49% of residents are considered to be in 'very good' health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in 'very bad' health, which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – The soft sediment coastline of this sub-cell is composed of mineral gleys which comprise the soil to the north and south of Lamlash Bay where the area is defined by its undulating lowlands with gentle slopes. Around the bay itself, mineral podzols derived from fluvioglacial and raised beach sand as well as gravel derived from acid rock can be found. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Improved Grassland' and 'Land capable of supporting Mixed Agriculture'.

The bedrock is made up of sandstone, breccia and conglomerate. The seabed itself is made up of shallow circalittoral sand and rock.

Land use in the Lamlash area is mainly defined as being open space, countryside and housing.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the East Arran Coastal Water Body, which has an overall status of Moderate with High confidence, an overall ecological status of Moderate and an overall chemical status of Pass.

Climatic Factors – There are almost 40 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is over 80 people; over 30 more people than are at risk from the current day 1:200 year event. There are also seven additional non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The A841 is the main road within this sub-cell. There is also only one IED Site within this sub-cell; the St Molios MCFF. The Arran – Holy Isle power cable is present within this sub-cell.

The risk of coastal flooding to material assets is present within this sub-cell. In the 200 year scenario there are approximately seven non-residential properties at risk. There are also a number of A roads and minor roads at risk. There are no non-residential properties at risk due to coastal erosion within this sub-cell in the 200 year scenario. There are no roads predicted to be directly affected by future coastal erosion; however a small portion of minor roads in Cordon runs within the vicinity or future erosion risk.

Cultural, Architectural & Archaeological Heritage – Within this sub-cell there are 69 listed buildings, one scheduled monument, one Conservation Area and several Canmore Sites including Millhill, Arran High School and Cordon.

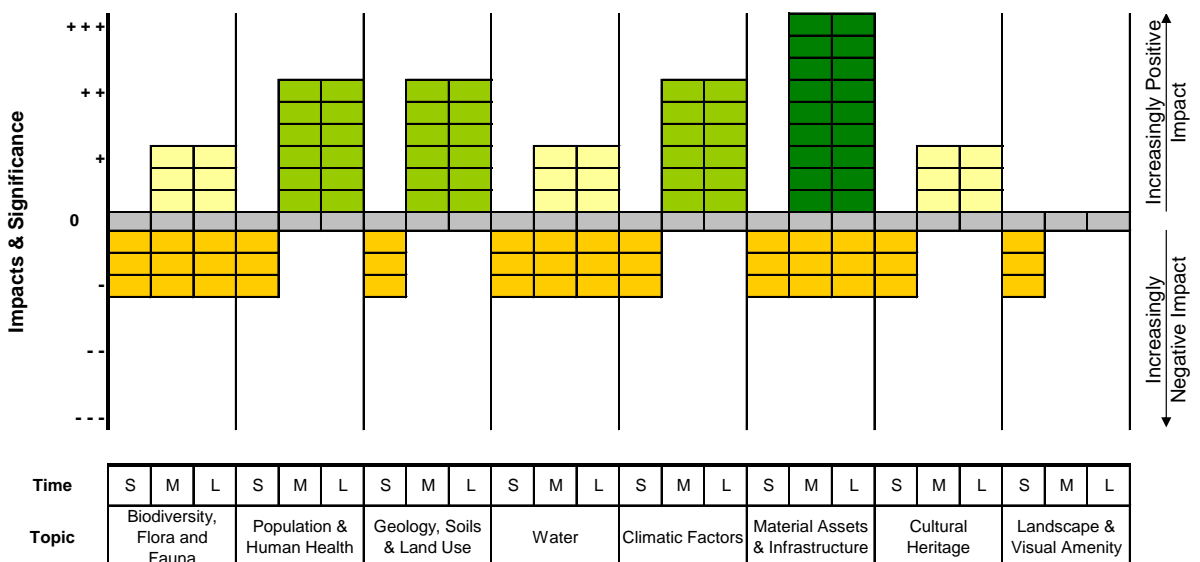
There are a number of vessels presumed to have been lost within this sub-cell and a number of wrecks, such as the Janet McNichol – a 20th century smack boat, which have been found.

Landscape & Visual Amenity – The town of Lamlash, with its historic core, supplemented by Victorian additions, has been expanded by the development of suburban housing along the coastline of this sub-cell. As a result, the traditionally farming landscape along this section of the coast has been the subject of pressure due to residential and recreational development. The more marginal nature of the farming economy, together with the influence of exposure, is reflected in the deterioration of hedges in some places, and their replacement with post and wire fences.

The Forestry Commission holds the deeds to a number of woodland areas within this sub-cell including Arran Estates, Blairmore and Mayish, and Glenkilin Excambion.

Holy Island, across Lamlash Bay from the sub-cell, is a Special Landscape Area.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	-1 / 1	-1 / 1
Population & Human Health (PHH)	-1	2	2
Geology, Soils and Landuse (S)	-1	2	2
Water (W)	-1	-1 / 1	-1 / 1
Climatic Factors (C)	-1	2	2
Material Assets & Infrastructure (MA)	-1	-1 / 3	-1 / 3
Cultural, Architectural & Archaeological Heritage (H)	-1	1	1
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - There is no potential for short, medium or long term, negative impacts on any European or Nationally protected site from the proposed shoreline management policies in this sub-cell. There is potential for short term, slight, negative impacts on local habitats and species, through habitat loss or disturbance, and long term, slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on Arran Moors SAC, owing to the lack of any requirement for intertidal or shoreline habitats by hen harrier, and because management measures will be at a greater distance than the maximum indicated for disturbance of the species. There is no potential for impacts on Clauchlands Point – Corrygills SSSI owing to the policy of No Active Intervention in this location (A2.1).

There is potential for short term, slight, negative impacts through direct, temporary localised loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species in the Marine Protected Area (MPA), such as (Dover) sole, anglerfish, blue whiting, cod, haddock, hake, herring, horse mackerel, mackerel, porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze. There is potential for spread of the invasive alga Sargassum during construction, however this could be mitigated for with strict site practice.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long term, slight, positive impacts, through creation of habitat for local flora and fauna.

All measures in the Lamlash area will need to be well designed and planned to minimise the potential for impacts to fish farms within Lamlash Bay.

Population & Human Health - Within policy units A2.1 and A2.3 there are unlikely to be any significant impacts upon local populations and human health in the short, medium and long term as a result of the proposed No Active Intervention policy in these areas. Within policy unit A2.2 at

Lamlash, during the construction of defences, there is the potential for slight, temporary, direct, negative impacts upon the local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc. The result of such works is the medium and long term protection of the population of Lamlash. Over 20 residential properties will directly benefit from the implementation of the proposed policy, which is over 45 people, and would provide moderate positive, medium to long term impacts.

Geology, Soils & Landuse - Within policy units A2.1 and A2.3, there are unlikely to be significant positive or negative, direct or indirect impacts upon local soils, geology or land use in the short, medium or long term.

In the Lamlash area the implementation of proposed policy is likely to have moderate, direct, positive impacts upon local soil, geology and land resources as these will be protected from coastal flood and erosion risk into the future. Some short term, slight, negative disturbance impacts to local land use (particularly to countryside – and housing in Lamlash) is however likely during construction.

Water - There is potential for short term, direct and indirect, slight, negative impacts upon water quality as a result of implementation of hard and soft measures within A2.2. These impacts have the potential to occur intermittently as construction and maintenance continues into the medium and long term, adjacent to the sensitive waters of the Marine Protected Area. Good planning of works and good working practices should be able to avoid or minimise the potential for negative impacts on water quality during construction or maintenance activities. Protection or management of Scottish Water assets that are at risk of erosion along beaches in the sub-cell could provide slight positive impacts into the medium and long term by minimising the potential for asset failure into the sensitive waterbody.

Within A2.1 and A2.3, there are unlikely to be significant positive or negative, direct or indirect impacts upon water quality in the short, medium or long term as a result of proposed policies.

Climatic Factors - Within policy units A2.1 and A2.3, the proposed No Active Intervention policy is unlikely to have any impacts in the short, medium and long term, as there is no additional flood risk to receptors and there is unlikely to be any change in natural GHG sequestering cover. The proposed policy of Hold the Line at Lamlash allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 18 residential properties and seven non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, moderate, positive impacts by being capable of managing the increased future risk from coastal flooding and erosion on this sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation.

Material Assets & Infrastructure - During the construction phase of proposed policy measures at Lamlash there is potential for slight, temporary, negative disturbance impacts upon local road infrastructure. Consideration should be given to such infrastructure during detailed design and construction in order to prevent, reduce and as fully as possible offset all such adverse impacts which are likely to occur. In the medium to long term, sections of the A841, and a minor road at Cuddy Dook, will directly benefit from the implementation of proposed policy within this unit; so too will Scottish Water assets which run along the beach. In addition to these, a total of seven non-residential properties are likely to be protected from coastal flood risk and erosion. Positive impacts upon material assets and infrastructure within this policy unit in the medium to long term will therefore be significant. Within policy units A2.1, the proposed policy will however not protect local minor roads from the risk of coastal flooding, which could give medium and long term, direct, slight, negative impacts.

All measures in the Lamlash area will need to be well designed and planned to minimise the potential for impacts to fish farms within Lamlash Bay.

Cultural, Architectural & Archaeological Heritage - Within policy units A2.1 and A2.3 the proposed policy will have no impact upon heritage features in the short, medium and long term.

Within the Lamlash area, there is the potential for the visual imposition of hard engineering works to have a slight, negative impact upon a few designated heritage features (some of which are residential properties) in the short, medium and long term. However, in the medium to long term, proposed defences will provide protection to these features from coastal flood risk. Such features include Lamlash Pier, Sea Gate and Hamilton Terrace (residential properties); all of which are Listed Buildings. This constitutes direct, slight, positive impact in the medium to long term.

Landscape & Visual Amenity - Within policy unit A2.2, the visual impact of construction/maintenance activities is likely to have short term, direct, slight, negative impacts upon the local landscape and local views, on those that are to be protected. Provided the shoreline management works are well designed and planned there is unlikely to be any medium to long term impacts on the landscape and local views. There are unlikely to be any impacts to the Holy Island Special Landscape Area.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant, negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the pier and river channel at Lamlash. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line and No Active Intervention policies within sub-cell A2 have the potential for short to long term, slight negative impacts on biodiversity, flora and fauna, water, and material assets and infrastructure, from recurring, localised shoreline management works. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, soils and land use, climatic factors, heritages features, and landscape and visual amenity. There is the potential for medium to long term, slight to significant positive impacts on people, soils, land use, water, climatic factors, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and potentially enhancing the habitats of the shoreline with soft engineering works.

7.14 SUB-CELL A3

Sub-cell	A3
Local Authorities	North Ayrshire Council
Sub-cell Information	
This sub-cell extends from Kingscross Point to Drumadoon Point and includes the communities of Whiting Bay, Kildonan and Blackwaterfoot. This section of shoreline is approximately 33.5km in length and is located entirely within the North Ayrshire Council area. There are two policy units within this sub-cell.	
A3.1 – Whiting Bay – Hold the line.	
A3.2 – Largymore to Drumadoon Point – No Active Intervention	
Key Plan Issues	
A3.1 – Significant coastal flood risk to properties at Montrose Terrace. The A841 road is also at significant risk of coastal flooding. No assets have been identified as being at risk of coastal erosion in this policy unit.	
A3.2 – One residential property was found to be at risk of coastal flooding at Kildonan. Localised sections of the A841 at Largymore and minor roads at Kildonan and Blackwaterfoot were also found to be at risk due to coastal flooding. No assets have been identified as being at risk due to coastal erosion in this policy unit.	
Key Environmental Issues	

Biodiversity, Flora and Fauna – There are two SPAs in the vicinity of this sub-cell; Arran Moors SPA, designated for breeding hen harrier; and Kintyre Goose Roosts, designated for Greenland White-fronted Goose.

There are four SSSIs located within or adjacent to this sub-cell; Arran Moors, designated for breeding hen harrier; Dippen Head, designated for geological formations; South Coast of Arran, designated for geological formations, maritime cliffs and shingle; and Drumadoon – Tormore, designated for geological formations.

This section of the Ayrshire coast is designated as a Marine Protected Area and is home to populations of harbour porpoise, (Dover) sole, anglerfish, blue whiting, cod, haddock, hake, herring, horse mackerel and mackerel. It also hosts populations of porbeagle shark, spiny dogfish, sandy ray and blue shark. Furthermore, there is a designated seal haul out site at the Sound of Pladda, Skerries. Several salmonid rivers occur within this sub-cell.

The invasive non-native brown alga *Sargassum* is known to occur in this area of the Ayrshire coastline.

Population & Human Health – This sub-cell is relatively sparsely populated. In the 200 year scenario there are almost 20 residential properties at risk due to coastal flooding in the 200 year scenario, which is over 40 people. There are no residential properties at risk due to coastal erosion within this sub-cell. Wave overtopping has been identified as a risk in the Whiting Bay area, along with joint probability flood risk from coastal, river and surface water sources around Montrose Terrace.

In North Ayrshire, 49% of residents are considered to be in 'very good' health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in 'very bad' health, which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – The undulating lowlands of this area are covered by deposits of mineral gleys derived of marls, cornstones and sandstone of the Triassic age. To the west, peaty podzols make up the earth having been derived from felsites and allied igneous rocks. Coastal farmland within this sub-cell is largely classified as 'Land capable of supporting Improved Grassland' and 'Land capable of supporting Mixed Agriculture'.

To the east, the bedrock is made up of sandstone, breccia and conglomerate sedimentary rock with unnamed igneous intrusion. To the south and west, it is made up of mudstone, sandstone and limestone with unnamed igneous intrusion. The seabed is composed of shallow circalittoral rock, sand and mixed sediment as well as infralittoral rock, sand and mixed sediment.

The land in the area is largely used as open space, with housing concentrated in Kildonan, Kilmory, Lagg and Slidery, all of which are situated in policy unit A3.2; as well as Whiting Bay in policy unit A3.1.

Water – This sub-cell is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the East Arran and South Arran Coastal Water Bodies. Both of these water bodies have an overall status of Moderate with High confidence, an overall ecological status of Moderate and an overall chemical status of Pass.

Climatic Factors – There are over 30 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is almost 75 people; roughly 30 more people than are at risk from the current day 1:200 year event. There are also seven non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – The A841 is the main road within this sub-cell. The sub-sea telecommunications cable BT-HIE Seg 1.5 runs from Blackwaterfoot to Ardnacross on the Isle of Mull.

The risk to material assets of coastal flooding is present within this sub-cell. In the 200 year scenario there are approximately four non-residential properties at risk. There is a proportion of A road and minor road also at risk. There are no material assets at risk of coastal erosion within this sub-cell.

Cultural, Architectural & Archaeological Heritage – There are 25 listed buildings, 10 scheduled monuments and three Properties in Care within this sub-cell. There are also a number of Canmore Sites such as Whiting Bay, Breadalbane Caravan Park and Seafield Cottage.

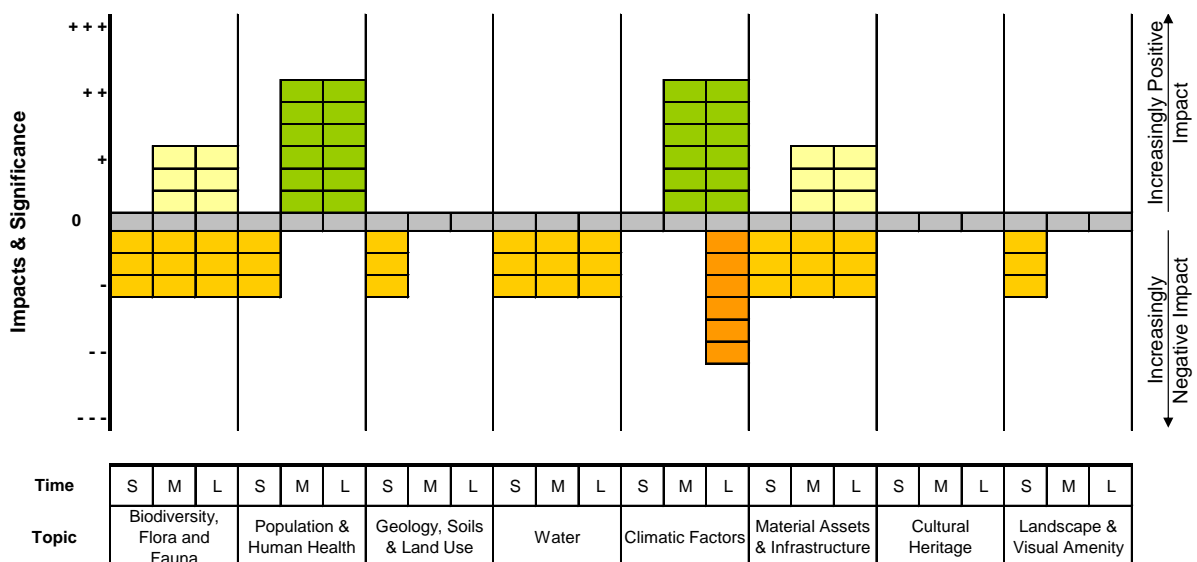
A number of vessels are presumed to have been lost here and a number of wrecks, such as the Princess Patricia – a 20th century steamship, have been found.

Landscape & Visual Amenity – The coastal landscape of this sub-cell is defined by its lowland fringe which incorporates areas of raised beach which broaden where valleys reach the coast. The agricultural land in this area is defined by its small, geometric hedged fields, spotted with many of the islands most settled farmhouses and cottages. The more marginal nature of the farming economy, together with the influence of exposure, is reflected in the deterioration of hedges in some places, and their replacement with post and wire fences.

The patterns of broadleaf woodland in this landscape reflect closely the interplay of topography and exposure, together with the influence of human land use. The semi-natural woodland of oak and birch found in many of the upland valleys tends to give way to introduced species, such as beech, in the lower more sheltered parts of the valley. The transition in woodland types often coincides with the change from unenclosed to enclosed land.

The Forestry Commission holds the deeds to a number of woodland areas within this sub-cell including Arran Estates, Corriecravie Moor Exchange and Kilpatrick Farm.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	-1 / 1	-1 / 1
Population & Human Health (PHH)	-1	2	2
Geology, Soils and Landuse (S)	-1	0	0
Water (W)	-1	-1	-1
Climatic Factors (C)	0	2	-2 / 2
Material Assets & Infrastructure (MA)	-1	-1 / 1	-1 / 1
Cultural, Architectural & Archaeological Heritage (H)	0	0	0
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - There is no potential for short, medium or long term, negative impacts on any European or Nationally protected site from the proposed shoreline management policies in this sub-cell. There is potential for short term, slight, negative impacts on local habitats and species through habitat loss or disturbance, and medium to long term, slight, positive impacts on local habitats and species through the potential for habitat creation.

There is no potential for impacts on Arran Moors SPA or Kintyre Goose Roosts SPA, owing to the policy of No Active Intervention in policy unit A3.2, the lack of any requirement for intertidal or shoreline habitats by hen harrier or Greenland white-fronted goose, and because management measures will be at a greater distance than the maximum indicated for disturbance of these species.

There is no potential for any impacts on Arran Moors SSSI owing to the lack of any requirement for intertidal or shoreline habitats by hen harrier, and because management measures will be at a greater distance than the maximum indicated for disturbance of this species. There is no potential for impacts on Dippen Head SSSI, South Coast of Arran SSSI or Drumadoon – Tormore SSSI, owing to the policy of No Active Intervention in the areas in which these sites are located.

There is potential for short term, slight, negative impacts through direct temporary loss of local undesignated habitat, and through construction phase disturbance and displacement of species in the vicinity of the works. Species at risk could include those in the Marine Protected Area (MPA) such as (Dover) sole, anglerfish, blue whiting, cod, haddock, hake, herring, horse mackerel, mackerel, porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze. There is potential for spread of the invasive alga Sargassum during construction however this could be mitigated for with strict site practice.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long term, slight, positive impacts through creation of habitat for local flora and fauna.

Population & Human Health - The construction/rehabilitation of proposed defences within policy unit A3.1 is likely to have temporary, slight, negative impacts upon local population and human health due to disturbance. Adverse disturbance impacts might include noise, vibration, pollution, dust and traffic etc.

The result of the shoreline management works with this unit is the medium and long term protection of almost 20 residential properties (over 40 people) from coastal flood risk. The protection of these people constitutes a moderate, direct, positive, medium to long term impact of implementing proposed policy.

Within policy unit A3.2, the policy of No Active Intervention will not provide protection to the one residential property at risk, which could therefore lead to medium and long term, slight, negative impacts. Flood risk to individual receptors such as this can however be managed via other means, including individual property protection and increased property resilience. These methods may be more viable than attempting to produce a larger and more complex flood risk management scheme.

Geology, Soils & Landuse - Within this sub-cell there are unlikely to be significant impacts upon local soils, geology and land use in the medium or long term. Any disturbance impacts to shoreline sediments of implementing the Hold the Line policy at Whiting Bay are likely to be short term and localised. The area of potential erosion in the far west of the sub-cell, near Drumaddon Point, will not be managed by the policy of No Active Intervention. This natural erosion however is not directly impacting upon any people, property or assets.

Water – At Whiting Bay there is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts are likely to occur intermittently as maintenance of the measures continues into the medium and long term.

For the remainder of the sub-cell the policy is No Active Intervention and no impacts on water quality would be anticipated in the short, medium and long term.

Climatic Factors - The proposed policy of Hold the Line at Whiting Bay allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 5 residential properties and two non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, moderate, positive impacts by way of managing the increased future risk from coastal flooding and erosion in this area. In the remainder of the sub-cell however, there is a policy of No Active Intervention and potentially an additional 10 residential properties and one non-residential property that are at risk of climate change influenced flooding over the current 1:200 year scenario. This could lead to direct, moderate, negative impacts in the long term. The policy in this part of the sub-cell could however be amended in future iterations of the SMP in the medium to long term to plan for management of this climate change influenced flood risk.

Material Assets & Infrastructure - During the construction phase of proposed policy measures for policy unit A3.1 there is potential for temporary, slight, negative disturbance impacts upon local road infrastructure. Consideration should be given to this infrastructure during detailed design and construction in order to prevent, reduce and as fully as possible offset all such adverse disruption impacts. In the medium and long term, four non-residential properties will directly benefit from the implementation of proposed policy, as will the A841 coastal road, insofar as these will be protected from coastal flood risk. This is likely to have direct, slight, positive impacts upon material assets and infrastructure within this unit.

Within policy unit A3.2, there are unlikely to be significant, positive or negative, direct or indirect

impacts upon local material assets and infrastructure in the short term. In the medium to long term, the proposed policy is likely to have permanent, direct, slight, negative impacts upon localised sections of the A841, insofar as such sections will not be protected from the risk of coastal flooding.

Cultural, Architectural & Archaeological Heritage – Within the sub-cell there are unlikely to be any direct or indirect, negative impacts on local heritage features from adoption of the proposed policies. No heritage features are known to be at risk of coastal flooding or erosion within the area and no proposed engineering works are likely to significantly impact on the setting of any known features.

Landscape & Visual Amenity - Within policy unit A3.1, the visual impact of the construction/maintenance activities is likely to have short term, direct, slight, negative impacts upon the local landscape. The negative visual impact of the engineering works is likely to be limited to those being protected in the medium and long term. There are unlikely to be any medium or long term impacts on landscape and visual amenity in the sub-cell.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant, negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the river channel at Whiting Bay. Careful and coordinated planning of any works required should be undertaken in order to ensure that there

are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line and No Active Intervention policies within sub-cell A3 have the potential for short to long term, slight, negative impacts on local biodiversity, flora and fauna, water quality, and material assets and infrastructure from recurring, localised shoreline management works or no protection from coastal flood risk. The No Active Intervention policy may provide long term, moderate, negative impacts on a few properties as a result of no management of climate change influenced flood risk. All other potential negative impacts are predicted to be slight and short term, mainly due to construction phase disturbances on people, soils and land use, and landscape and visual amenity. There is the potential for medium to long term, slight to moderate, positive impacts on people, climatic factors, material assets and infrastructure, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk, as well as potentially enhancing shoreline habitats with soft engineering works.

7.15 SUB-CELL A4

Sub-cell	A4
Local Authorities	North Ayrshire Council
Sub-cell Information	
This sub-cell extends from Drumadoon Point to Lochranza, is approximately 30km in length and is located entirely within the North Ayrshire Council area. There are two policy units within this sub-cell.	
A4.1 – Drumadoon Point to Tormore – No Active Intervention.	
A4.2 – Machrie Bay to Lochranza – Hold the line/Managed Realignment.	
Key Plan Issues	
<p>A4.1 – No assets have been identified as being at risk of coastal flooding or erosion in this policy unit.</p> <p>A4.2 – One residential property was found to be at risk of coastal flooding. Significant sections of the A841 were also found to be at risk of coastal flooding at Machrie Bay, Dougarie Pirnmill, Thundergay and Catacol Bay. One non-residential property and a section of the A841 were also found to be at risk due to coastal erosion.</p>	
Key Environmental Issues	
<p>Biodiversity, Flora and Fauna – There is one SAC in the vicinity of this sub-cell; Tarbert Woods SAC, designated for Western acidic oak woodland, and two SPAs; Arran Moors SPA, designated for breeding hen harrier; and Kintyre Goose Roosts SPA, designated for Greenland white-fronted goose.</p>	

There are three SSSIs located within or adjacent to this sub-cell; Arran Moors, designated for breeding hen harrier; Drumadoon – Tormore, designated for geological formations; and Arran Northern Mountains, designated for geological formations, upland habitats, and associated species.

The marine species porbeagle shark, spiny dogfish, sandy ray and blue shark are known to frequent the area. Several salmonid rivers occur within this sub-cell.

Population & Human Health – This sub-cell is relatively sparsely populated. There is no risk to residential properties from coastal flooding within policy unit A4.1. Within A4.2 there is one residential property at risk in the 200 year scenario. There are no people or property at risk from coastal erosion within this sub-cell.

In North Ayrshire, 49% of residents are considered to be in ‘very good’ health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in ‘very bad’ health, which is higher than the national average of 1% for Scotland.

Geology, Soils and Landuse – Much of the coast in this area is made up of mineral gleys derived from arenaceous schists and strongly metamorphosed argillaceous schists of the Dalradian series. Such soil overlies the undulating lowlands and non-rocky valley sides of the area. Brown soils characterise the earth to the north of this sub-cell whilst mineral and peaty podzols of fluvioglacial and raised beach sand and gravel parent material define the south. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Improved Grassland’.

To the south of this sub-cell, the bedrock is made up of rock from the Stewarty and Stratheden Group. Sandstone with subordinate conglomerate, siltstone and mudstone can also be found in this area and further north. To the north and west of the sub-cell, rocks of the Southern Highland group can be found. The seabed itself is made up of deep and shallow circalittoral sand and rock as well as infralittoral sand.

The land within this sub-cell is predominantly countryside with some housing concentrated in Pirmill.

Water – This sub-cell is part of the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Kilbrannan Sound Coastal Water body. This water body has an overall status of Moderate with High confidence, an overall ecological status of Moderate and an overall chemical status of Pass.

Climatic Factors – There are no additional residential properties or non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell over the current day 1:200 year event.

Material Assets & Infrastructure – There are no major roads within this sub-cell, however there is residual sub-sea cable infrastructure. In the sub-cell there are portions of minor roads at risk from a 200 year coastal flood event and in the vicinity of future predicted coastal erosion. There are no non-residential properties at risk of coastal flooding within this sub-cell; however one non-residential property is in the vicinity of future predicted erosion risk.

Cultural, Architectural & Archaeological Heritage – There are 23 listed building and seven scheduled monuments within this sub-cell. Of the latter, King’s Cave is situated within an area of coastal flood risk in policy unit A4.1. Auchengallon is the only Property in Care here, though there are several Canmore Sites within this sub-cell.

The HMS/M Vandal lies to the north of this sub-cell in the Sound of Bute. It joins the numerous vessels which are presumed to have been lost here.

Landscape & Visual Amenity – North Arran is a Special Landscape Area and a National Scenic Area, encompassing all of the sub-cell.

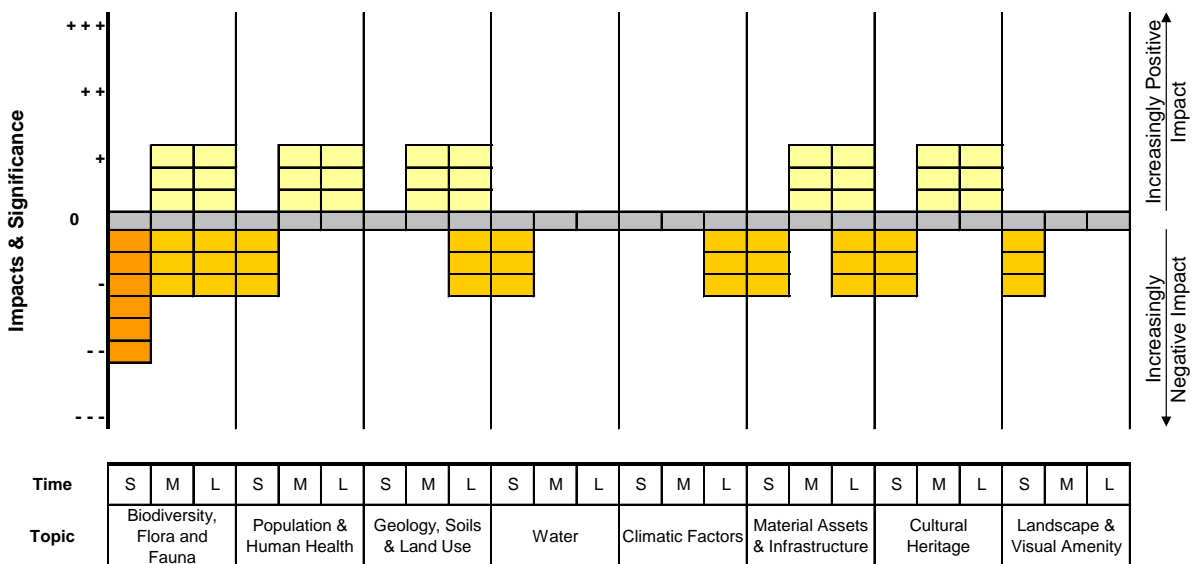
This sub-cell is characterised by its raised beaches and old cliff lines. These are cut into a range of different rock types including red sandstones, schists and carboniferous rocks. The schists create a folded coastal landscape of crags and cliffs; many of which remain as craggy escarpment or are clothed in rich, but dramatically wind-sheared broadleaf woodland.

Surrounding Machrie Moor, in policy unit A4.2, is an extensive area of lowland adjoining the coast north of Blackwaterfoot (A3.2). It is partially enclosed by rising hills to the north and east, and by the low coastal hill of Torr Rìgh Mòr to the west. In archaeological terms, Machrie Moor comprises one of the most significant areas in Scotland, with a large number of prehistoric remains including standing stones, stone circles and cairns.

The area in policy unit A4.2 around Machrie Moor is characterised by a dispersed pattern of settlement. For the most part, this comprises a scatter of traditional farmhouses and cottages, with a few more modern houses. There are also a number of isolated cul-de-sac developments of modern suburban housing which contrast strongly with the surrounding pattern of land use and settlement.

The Forestry Commission holds the deeds to the Dougarie Estate.

Summary Chart of Impacts



Environmental Assessment

Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-1 / 1	-1 / 1
Population & Human Health (PHH)	-1	1	1

Geology, Soils and Landuse (S)	0	1	-1 / 1
Water (W)	-1	0	0
Climatic Factors (C)	0	0	-1
Material Assets & Infrastructure (MA)	-1	1	-1 / 1
Cultural, Architectural & Archaeological Heritage (H)	-1	1	1
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - There is no potential for short, medium or long term negative impacts on any European protected site from the proposed shoreline management policies in this sub-cell. There is potential for short term, moderate, negative impacts on a nationally protected site. There is potential for short term, slight, negative impacts on local habitats and species, through habitat loss or disturbance, and long term, slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on Tarbert Woods SAC, as there is no pathway for impact owing to the location of the site almost 15km across open water. There is no potential for impacts on Arran Moors SPA or Kintyre Goose Roosts SPA, owing to the policy of No Active Intervention in policy unit A4.1, the lack of any requirement for intertidal or shoreline habitats by hen harrier or Greenland white-fronted goose, and because management measures will be at a greater distance than the maximum indicated for disturbance of these species.

There is no potential for any impacts on Arran Moors SSSI owing to the lack of any requirement for intertidal or shoreline habitats by hen harrier, and because management measures will be at a greater distance than the maximum indicated for disturbance of this species. There is no potential for impacts on Drumadoon – Tormore SSSI, owing to the policy of No Active Intervention in policy unit A4.1, and the lack of any pathway by which the designated features (geological formations) of the site could be impacted upon by the proposed shoreline management measures. There is potential for short term, moderate, negative impacts on designated upland habitats and their associated species of Arran Northern Mountains SSSI, from construction or rehabilitation of hard defences, should any work be undertaken within the designated site boundaries where they extend close to the coastline at Lochranza. It should be possible to mitigate for any impacts on this site with careful planning to ensure that shoreline protection measures do not encroach upon the designated site boundary.

There is potential for short-term, slight, direct, temporary loss of local undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long-term slight positive impacts, through creation of habitat for local flora and fauna.

Population & Human Health - Within policy unit A4.1 there are unlikely to be any significant impacts upon local populations and human health in the short, medium and long term as a result of the

proposed No Active Intervention policy in this area. Within policy unit A4.2, from Machrie Bay to Lochranza, during the undertaking of any engineering works, there is the potential for slight, temporary, direct, negative impacts upon the local population and human health due to disturbance such as noise, vibration, pollution, dust, traffic and limited access etc. With the limited road network in the sub-cell, any works to manage flood risk or realign the roads could have greater disturbance impacts in the medium and long term, as there are limited options for traffic diversions. The impacts of this can be mostly mitigated for with good planning and timing and works.

One residential property will benefit from slight, positive impacts in the medium and long term from protection from coastal flooding as a result of the Hold the Line policy.

Geology, Soils & Landuse - Within this sub-cell there are unlikely to be significant, positive or negative, direct or indirect impacts upon local soil, geology or land use in the short term. In the medium to long term, with the Hold the Line policy at Machrie Bay to Lochranza, there is the potential for protection from erosion at Machriewater Farm and Machrie Golf Course thereby resulting in slight positive impacts. If Managed Realignment is adopted in the long term, there could be the loss of soil and land resource in this area. Given the steep shoreline of much of sub-cell there are unlikely to be any additional impacts on soils, geology and land resource.

Water - Within policy unit A4.2 there is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts have the potential to occur intermittently as maintenance of the measures continues into the medium and long term.

Climatic Factors - The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy however does not provide protection to any additional residential or non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have neutral impacts. Managed Realignment of the shoreline, and therefore realignment of the A841 in the long term, has the potential for greater short term losses of GHG sequestering vegetation, prior to re-establishment.

Material Assets & Infrastructure – During the construction phase of proposed policy measures for policy unit A4.2 there is potential for temporary, slight, negative disturbance impacts upon local road infrastructure. Consideration should be given to this infrastructure during detailed design and construction in order to prevent, reduce and, as fully as possible, offset all such adverse disruption impacts. The policies however are to protect the A841 into the medium and long term, providing direct, slight, positive impacts. There is the potential for medium to long term, indirect, slight, negative impacts to Machrie Golf Course if the A841 is realigned in the area.

Cultural, Architectural & Archaeological Heritage - Within policy unit A4.1 there are unlikely to be significant, positive or negative impacts upon the heritage features in the short, medium or long term.

Within A4.2 there is one listed building (the Dougarie Lodge Boat House) and a number of Canmore sites. There is the potential for slight, negative impacts upon these features in the short term, as engineering works result in the temporary deterioration of their setting. However, there may also be protection of such features and therefore slight, positive impacts of the proposed policy in the medium to long term.

Landscape & Visual Amenity - Within policy unit A4.2, the visual impact of the construction/maintenance activities is likely to have short term, direct, slight, negative impacts upon the local landscape. The negative visual impact of the engineering works is likely to be limited to those being protected in the medium and long term. There are unlikely to be any medium or long term impacts on landscape and visual amenity in the sub-cell. Provided the shoreline management

works are sensitively designed and planned, they are unlikely to have any significant medium or long term, negative impacts on the North Arran Special Landscape Area and National Scenic Area.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the river channel at Machrie Bay. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line / Managed Realignment and No Active Intervention policies within sub-cell A4 has the potential for short term, construction phase, moderate, negative impacts on the Arran Northern Mountains SSSI, and medium to long term, slight, negative impacts on local biodiversity, flora and fauna. There is the potential for short term, negative impacts due to construction phase disturbances on people, water quality, heritage features, and landscape and visual amenity. There is also the potential for slight, negative, impacts in the long term on soils and landuse, and climatic factors, as a result of the implementation of the Managed Realignment policy,

due to loss of shoreline and GHG sequestering vegetation. There is the potential for medium to long term, slight, positive impacts on people, soils and land use, material assets and infrastructure, heritage features, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood and erosion risk and future predicted risk, and by potentially enhancing the habitats of the shoreline with soft engineering works.

7.16 SUB-CELL GREAT CUMBRAE

Sub-cell	Great Cumbrae
Local Authorities	North Ayrshire Council
Sub-cell Information	
This sub-cell includes the entire coastline of the Island of Great Cumbrae. The shoreline of this island is approximately 21km in length and is located entirely within the North Ayrshire Council area. There is only one policy unit within this sub-cell.	
Great Cumbrae – Great Cumbrae – Hold the line/Managed Realignment.	
Key Plan Issues	
Great Cumbrae – Localised coastal flood risk to properties at Quayhead, Millport and at the Water Sports Centre jetty. Roads to the north of the island are also at risk due to coastal flooding. No assets have been identified as being at risk due to coastal erosion in this policy unit.	
Key Environmental Issues	
Biodiversity, Flora and Fauna – There are two SPAs in the vicinity of this sub-cell; Arran Moors SPA, designated for breeding hen harrier; and Renfrewshire Heights SPA, also designated for breeding hen harrier.	
There are two SSSIs located within or adjacent to this sub-cell; Ballochmartin Bay, designated for sandflats, marine mammals, flora and fauna of the intertidal area, herb-rich grassland and roadside verges supporting slow-worms (<i>Anguis fragilis</i>), and a number of uncommon higher plant species; and Kames Bay, designated for sandflats, marine mammals, and intertidal coastland habitat.	
The Cumbraes MCA is also within this area and hosts a population of porbeagle shark, spiny dogfish, sandy ray and blue shark.	
The invasive non-native brown alga Sargassum is known to occur in this area of the Ayrshire coastline.	
Population & Human Health – Millport is the largest settlement on Great Cumbrae and is home to approximately 1280 people. There are four residential properties at risk due to coastal flooding within this sub-cell in the 200 year scenario, almost 10 people at risk. There are no people or residential properties at risk of coastal erosion within this sub-cell.	
In North Ayrshire, 49% of residents are considered to be in ‘very good’ health, which is below the national average of 52% for Scotland, while 2% of the local residents are considered to be in ‘very bad’ health, which is higher than the national average of 1% for Scotland.	

Geology, Soils and Landuse – The soil on the island is largely made up of brown soils derived of upper old red sandstone which overlies the non-rocky undulating lowlands which define the island. Coastal farmland within this sub-cell is largely classified as ‘Land capable of supporting Mixed Agriculture’ and ‘Land capable of supporting Arable Agriculture’.

The bedrock is composed of undifferentiated sandstone and conglomerate, and undifferentiated siltstone and mudstone. To the very south of the island, the bedrock is composed of basalt, lava and undifferentiated sandstone. The seabed is made up of shallow circalittoral mud and rock and infralittoral rock and mud also.

The land is, for the most part, countryside and open space; with some business, industry, retail and housing in Millport.

Water – Great Cumbrae is within the Scottish River Basin District. The shoreline of this sub-cell constitutes part of the Firth of Clyde Inner – Cumbraes, and the Largs Channel Coastal Water Bodies. Of these, the former has an overall status of Moderate with High confidence, an ecological status of Moderate and an overall chemical status of Pass. The latter water body has an overall status of Good with High confidence, an overall ecological status of Good and an overall chemical status of Pass.

Climatic Factors - There are approximately 75 residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell, which is approximately 165 people; over 150 more people than are at risk from the current day 1:200 year event. There are also almost 10 non-residential properties at risk of the 1:200 year climate change coastal flood event in this sub-cell.

Material Assets & Infrastructure – There are no major roads within this sub-cell. The sub-sea telecommunications cable BT-HIE 1.2 runs from Portachur to Kilchatten Bay on the Isle of Bute. The port of Millport is situated within this sub-cell.

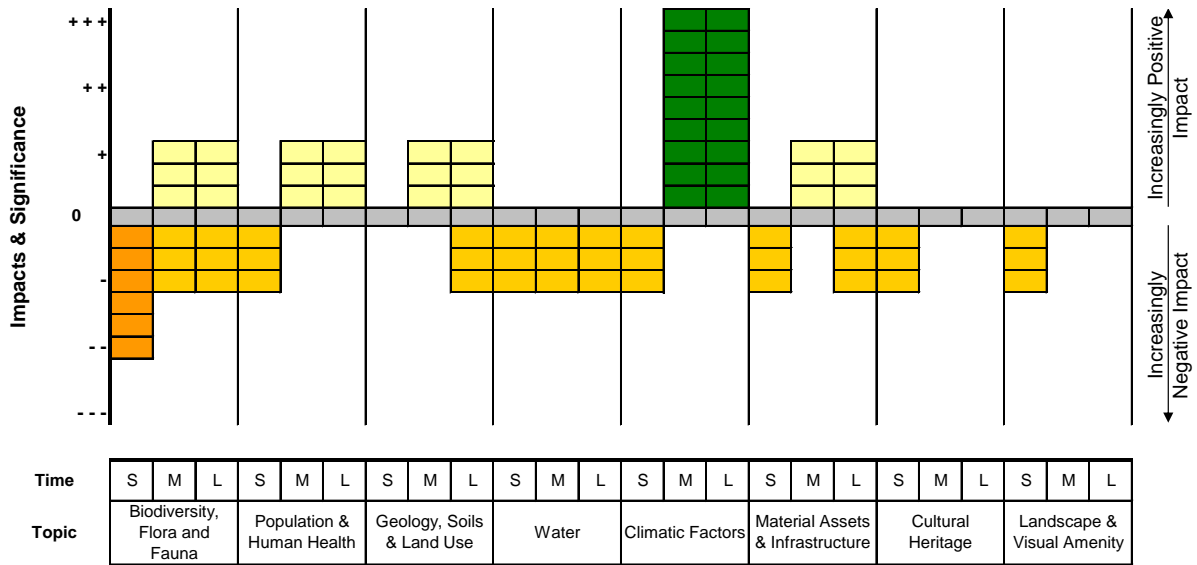
The risk to material assets of coastal flooding is present within this sub-cell. In the 200 year scenario there are approximately five non-residential properties at risk. There are also a number of A roads, B roads and minor roads at risk. There is no anticipated risk to material assets due to coastal erosion in this sub-cell.

Cultural, Architectural & Archaeological Heritage – Millport is the only Conservation Area within this sub-cell. There are also 46 listed buildings, along with a number of Canmore Sites such as the Garrison House and Golf Road, in Millport.

There are a number of vessels which are presumed to have been lost within this sub-cell and a number of wrecks, including the Catalina Flying Boat - a 20th century aircraft off the coast of ferry point, which have been found. Coastal built heritage features such as the Imma and the Margaret are found within this sub-cell.

Landscape & Visual Amenity – The island is designated as the Great Cumbrae Special Landscape Area. The landscape on the island of Great Cumbrae is defined by its vulnerability, due in part to its island status, but also as a result of the particular pressures of residential and recreational development, particularly along the east coast. The island is given over to improved pasture and smaller areas (mainly steeper slopes) under deciduous woodland or heather moorland. Settlements such as Millport have, to some extent, experienced considerable growth during the present century.

Summary Chart of Impacts



Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	-1 / 1	-1 / 1
Population & Human Health (PHH)	-1	1	1
Geology, Soils and Landuse (S)	0	1	-1 / 1
Water (W)	-1	-1	-1
Climatic Factors (C)	-1	3	3
Material Assets & Infrastructure (MA)	-1	1	-1 / 1
Cultural, Architectural & Archaeological Heritage (H)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Discussion of Impacts

Biodiversity, Flora & Fauna - There is no potential for short, medium or long term, negative impacts on any European protected site from the proposed shoreline management policies of Hold the Line (short term) and Hold the Line/Managed Realignment (medium/long term) in this sub-cell. There is potential for short term, moderate, negative impacts on a nationally protected site. There is potential for short term, slight, negative impacts on local habitats and species, through habitat loss or disturbance, and medium to long term, slight, positive impacts on local habitats and species through habitat creation.

There is no potential for impacts on Arran Moors SPA or Renfrewshire Heights SPA, owing to the lack of any requirement for intertidal or shoreline habitats by hen harrier, and because management measures will be at a greater distance than the maximum indicated for disturbance of this species.

There is potential for short to long term, slight, negative impacts on protected habitats and species of Ballochmartin Bay SSSI and Kames Bay SSSI from construction or rehabilitation of hard defences. This relates to direct damage in the footprint of defences and disturbance of species during the construction phase. It should be possible to mitigate for any impacts on this site with careful planning to ensure that shoreline protection measures do not encroach upon the designated site boundaries, and through effective planning and timing of works.

There is potential for short term, slight, direct, temporary, local loss of undesignated habitat, and construction phase disturbance and displacement of species in the vicinity of the works, which could include marine species in the Cumbræes MCA such as porbeagle shark, spiny dogfish, sandy ray and blue shark. Impacts could be mostly mitigated for with good site practice, effective planning and timing of works. These construction phase impacts are likely to occur intermittently, owing to the ongoing nature of rehabilitation works. Additional undesignated terrestrial habitat may be lost should Managed Realignment be necessary in the medium/long term, however this will be a result of natural processes. There is potential for a permanent local loss of coastal habitat where new defences are constructed owing to coastal squeeze.

Should soft shoreline protection measures such as nourishment be used in certain locations, these have the potential for long-term, slight, positive impacts, through creation of habitat for local flora and fauna.

Population & Human Health - The construction/rehabilitation of proposed defences/the potential Managed Realignment of the coast is likely to have slight, temporary, direct, negative impacts upon local population and human health. Adverse disturbance impacts might include noise, vibration, pollution, dust and traffic etc.

The result of the shoreline management works is the long term protection of four residential properties within this sub-cell. The protection of these properties constitutes a slight, positive impact, in the medium to long term, of implementing the proposed policy within this sub-cell.

Geology, Soils & Landuse - Within this sub-cell there are unlikely to be significant, positive or negative, direct or indirect impacts upon geology in the short, medium or long term.

With regard to local soil and land resource, proposed defences are likely to have slight, direct, positive impacts upon soil and land resources in the medium to long term insofar as resources will continue to be protected from flood risk and erosion. This will not be the case in the event that Managed Realignment is the preferred measure, as the immediate shoreline will be left subject to natural coastal processes. In both cases, some short term disturbance impacts to local land use (particularly to open space, business, industry and retail) are likely during construction.

Water - Within this sub-cell there is the potential for short term, direct and indirect, slight, negative environmental impacts on water quality from sedimentation and spills as a result of construction and maintenance of hard and soft engineering measures. These impacts have the potential to occur intermittently as construction and maintenance continues into the medium and long term, adjacent to the sensitive waters of the Marine Conservation Area. Good planning of works and good working practices should be able to avoid or minimise the potential for negative impacts on water quality during construction or maintenance activities.

Climatic Factors - The proposed policy of Hold the Line allows for planning for climate change and will provide no impediment to future interventions to address new potential risks. This policy could provide protection to an additional 70 residential properties and five non-residential properties, over the current 1:200 year scenario, that are at risk of climate change influenced flooding. Therefore, in the medium to long term, the implementation of the proposed policy will have direct, significant, positive impacts by being capable of managing the increased future risk from coastal flooding on this

sub-cell. The management of the shoreline in this sub-cell has the potential for short term, construction phase losses of GHG sequestering vegetation.

Material Assets & Infrastructure - During the construction phase of proposed policy measures at Millport there is potential for temporary, slight, negative disturbance impacts upon local road infrastructure and businesses. Consideration should be given to such infrastructure during detailed design and construction in order to prevent, reduce and as fully as possible offset all such adverse impacts which are likely to occur. Five non-residential properties, including the Water Sports Centre, will directly benefit from the implementation of proposed shoreline management works in the medium and long term, as will a number of B roads to the north of the island, as these will be protected from coastal flood risk. This is likely to have direct, slight, positive impacts upon such assets and infrastructure in the medium and long term. In the event that Managed Realignment is the preferred measure in the long term there is the potential for slight, negative disturbance impacts to affect local material assets and infrastructure, along with slight, positive impacts of a new road that is not at risk of coastal flooding.

Cultural, Architectural & Archaeological Heritage – Shoreline management works at Millport are unlikely to directly impact upon the Millport Conservation Area or any protected heritage features in the area. There is the potential however, for short term, construction phase, slight, negative impacts on the setting of this area during works. Provided the management works are designed and planned in keeping with the area, there are unlikely to be any medium to long term negative impacts.

Landscape & Visual Amenity - The visual impact of the construction/maintenance activities is likely to have short term, direct, slight, negative impacts upon the local landscape and local views. Provided the shoreline management works are well designed and planned, there are unlikely to be any medium to long term impacts on the landscape and visual amenity. There are unlikely to be any impacts to the Great Cumbrae Special Landscape Area.

Potential sources of in-combination effects identified as part of this assessment include:

- There is potential for cumulative visual effects on the landscape resulting from the implementation of shoreline management policies in adjacent sub-cells along the Ayrshire coastline. Careful and coordinated planning and design of defences in adjacent sub-cells should be undertaken in order to ensure that, in the long term, there will be no significant negative impacts on the coastal landscape.
- There is potential for in-combination effects with Local Development Plans (LDPs), should any development works be planned within the vicinity of shoreline management measures. A Habitats Regulations Appraisal undertaken for the South Ayrshire LDP found that the policy 'Outdoor public access and core paths' had potential for a likely significant effect on Glen App and Galloway Moors SAC. However, the HRA states that "Development proposals will not be permitted where they would adversely affect the integrity of the Glen App and Galloway Moors SPA", and there is no identifiable pathway for impact from the proposed shoreline management measures. The HRA also found that the policy for 'Renewable energy' had potential for likely significant effects on Natura sites within the zone of influence; however it states that "Development proposals will not be permitted where they would adversely affect the integrity of a Natura 2000 site". Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated. The Habitats Regulation Appraisal undertaken for the North Ayrshire Local Development Plan concludes that no likely significant effects are expected on Natura sites. Furthermore, the Policy ENV9 states that new development should not result in any unacceptable direct, indirect or cumulative impacts on nature conservation interests, particularly those with statutory protection such as Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.

- There is potential for in-combination effects with the Ayrshire and Arran Tourism Strategy (2012-2017), including the proposals for 'Activities & Natural Environment'. However, any strategies outlined in the Tourism Strategy that have potential to impact upon Natura sites will be subject to HRA, and it is outlined in both the South and North Ayrshire LDPs that development proposals should not result in any adverse effects on Natura sites. Consequently, no significant in-combination effects with the Ayrshire SMP are anticipated.
- There is potential for cumulative impacts should any dredging or channel clearance be undertaken in the vicinity of proposed shoreline management measures, which could include water quality impacts from sediment mobilisation or disturbance of local habitats and species. In this sub-cell, these areas could include the marina at Downcraig and the harbour at Millport Bay. Careful and coordinated planning of any works required should be undertaken in order to ensure that there are no significant in-combination negative impacts.

Key Conclusions:

Implementing the Hold the Line / Managed Realignment policy within the Great Cumbrae sub-cell has the potential for short term construction phase, moderate, negative impacts, and recurring slight negative, medium to long term impacts on the Ballochmartin Bay SSSI and Kames Bay SSSI, along with the potential for short term construction disturbance to marine species in the Cumbraes MCA. There is the potential for short to long term, slight, negative impacts on water quality from recurring, localised shoreline management works. There are potential short term negative impacts due to construction phase disturbances on people, climatic factors, material assets and infrastructure, heritages features, and landscape and visual amenity. There is the potential for slight, negative impacts in the long term on soils and land use, and material assets and infrastructure from implementation of the Managed Realignment policy, with loss of shoreline and disturbance to infrastructure. There is the potential for medium to long term, slight to significant, positive impacts on people, soils and land use, climatic factors, material assets and infrastructure, and biodiversity, flora and fauna. These impacts are from protecting people, features and assets from the current day flood risk and future predicted risk, and potentially enhancing the habitats of the shoreline with soft engineering works.

7.17 CUMULATIVE / IN-COMBINATION DEVELOPMENT IMPACTS

The SMP is proposing shoreline management works at most of the sub-cells and policy units within the study area. The implementation of all of these works would provide for the most significant cumulative and in-combination, positive, medium and long term impacts for the population and material assets along the Ayrshire coastline, by providing future-proofed protection to all receptors at risk of flooding and erosion. However, the simultaneous implementation of all proposed works would give the most significant, cumulative and in-combination, negative, short term impacts to the wider environment, unless a well phased and well planned approach is developed that can minimise or eliminate the potential for these construction impacts.

No significant cumulative and / or in-combination impacts with other Plans or Programmes have been identified. Local Development Plans have been taken into consideration in the development of the SMP and the SEA Environmental Report, and the SEA should complement these Plans by protecting

zoned areas. Future iterations of the Development Plans should have regard to the SMP for future planning zones and proposed development areas, to minimise the potential for cumulative and in-combination impacts with the implemented works from the SMP.

Shoreline management in areas that have ongoing and recurring works, such as dredging operations, will need to be carefully planned to minimise the potential for cumulative and / or in-combination impacts. If possible, these works may be able to be combined to provide future positive symbiotic impacts, e.g. where dredging operations can help beach nourishment, or new shoreline reinforcement can reduce maintenance requirements along the shoreline.

8 MITIGATION AND MONITORING

8.1 MITIGATION

Mitigation measures have been recommended where potential negative impacts are likely to result from a proposed measure for shoreline management. These mitigation measures aim to prevent, reduce and as fully as possible offset any significant adverse effects on the environment due to the implementation of the Plan.

8.1.1 General Mitigation

The principal mitigation recommendation is that the predicted negative effects should be considered further during the next stage of policy development, when details of the physical shoreline management measures (e.g. visual appearance and alignment of hard engineering works) can be optimised through detailed feasibility studies and design in order to limit identified impacts on sensitive receptors. Where feasible, natural flood management and soft / green engineering methods should be incorporated into the detailed planning to reduce the negative environmental impacts of a scheme.

Further environmental studies based on the detailed design and construction methodology should be undertaken as appropriate. These studies may involve, but are not limited to marine, aquatic and terrestrial ecology surveys, ornithological and bat surveys, fish surveys, landscape and visual assessments, WFD assessments, geotechnical investigations and heritage surveys. Further Appropriate Assessment, to meet the requirements of the Habitats Directive, of the preferred policy detailed design and construction methodology will be required at the project level, where potential impacts have been identified in this SEA and accompanying HRA for the SMP.

Before any works are carried out, detailed method statements and management plans (construction and environmental) should be prepared, including timing of works, information on the specific mitigation measures to be employed for each works area, and mechanisms for ensuring compliance with environmental legislation and statutory consents.

The timing of construction and maintenance works should be planned to avoid any potential for negative cumulative impacts or inter-relationships with other schemes, plans or projects, yet look to optimise any potential positive cumulative impacts or inter-relationships.

Contractors should be required to prepare Construction Environmental Management Plans (CEMPs), which would include a requirement for related plans to be prepared, as appropriate, for project implementation, such as Erosion and Sediment Control, Invasive Species Management, Emergency Response, Traffic and Safety Management, Dust and Noise Minimisation and Stakeholder Communication Plans.

Works should only be carried out once the method statements have been agreed with competent authorities such as the SNH, Historic Environment Scotland and SEPA. At the project level it will not be sufficient to defer the production of construction method statements. These should be completed in

the detailed design stage and may be subject to further Appropriate Assessment where potential impacts have been identified in this SEA and accompanying HRA for the SMP. Where there may be unavoidable impacts on protected habitats and/or species the necessary derogation licences should be applied for prior to seeking planning permission or approval for a scheme.

Marine construction and in stream works, such as sea wall refurbishment, groynes or dredging have the greatest potential for negative impacts during spawning / breeding and early nursery periods for aquatic and marine protected species. No marine or instream works should occur during restricted periods for relevant species and consultation should be undertaken with the appropriate authorities in this regard.

Monitoring of project level mitigation measures should be undertaken during and after works, to ensure effectiveness.

All works and planning of works should be undertaken with regard to all relevant legislation, licensing and consent requirements, and recommended best practice guidelines. An ecological clerk of works should be appointed for environmental management of each scheme, and where specific sensitive species may be impacted, an appropriate expert should also be appointed.

8.1.2 Mitigation by Environmental Impact

Table 8.1 demonstrates environmental impact specific mitigation measures that should be adopted within the SMP to minimise the potential for any negative effects on the wider environment of implementing the preferred policies. These mitigation measures should be implemented and further developed at the next detailed design stage and project level study stage.

Table 8.1 Proposed Mitigation Measures

Impact	Proposed Mitigation
Temporary disturbance and destruction of existing habitats and flora, and the displacement of fauna, along the shoreline and river corridors.	Good planning and appropriate timing of works to minimise impacts. Where applicable, prior to any vegetation clearance an appropriately qualified ecologist should be contracted to undertake a 'pre-vegetation clearance' survey for signs of nesting birds and protected and important species e.g. otters, kingfisher etc. Should important species be found during surveys the sequential approach of avoid, reduce or mitigate should be adopted to prevent significant impacts with advice from appropriately qualified professionals. Vegetation and tree clearance should be minimised and only occur outside the main bird nesting season from February to August. Where there are over-wintering birds, to avoid disturbance, works should be avoided between September and March. Following construction, replanting and landscaping, or natural revegetating, should be undertaken in line with appropriate guidelines that aim to improve local biodiversity. This will provide medium and long term benefits to the biodiversity, flora and fauna of the working

	areas. Where possible, original sediment/soil should be reinstated to original levels to facilitate natural restoration and recolonisation of habitat. Consider integration of design as part of blue/green infrastructure plans and habitat enhancement where possible
Temporary displacement of otters, birds, fish and other fauna during the construction period	Good planning, appropriate timing of works and sensitive construction methods are essential. Adherence to best practice construction guidelines.
Impact on European sites, habitats and species from construction or operation of shoreline management scheme.	Good planning and appropriate timing of works, and good construction and management practices will keep impacts to a minimum. Site and species specific mitigation provided in HRA for the SMP including site specific surveys, timing of works etc. Provide local, connected, compensatory habitat if loss of area of Natura site is unavoidable.
Spread of invasive species during construction.	Pre-construction survey for invasive species. Effective cleaning of equipment and machinery along with strict management protocols to combat the spread of invasive species. Preparation of invasive species management plan for construction and maintenance-related activities, if invasive species are recorded during the pre-construction surveys. Any imported materials will need to be free from alien invasive species. Post-construction survey for invasive species.
Dredging impacts on biodiversity, flora and fauna.	Minimise requirement for in-water works through good planning. Good dredging practices should be implemented, along with consultation with environmental bodies on methodology and appropriate timing to cause the least amount of damage, habitat loss, and sedimentation. Scoping or relevant specialist ecological surveys during the planning stage and prior to any construction works.
Construction disturbance to the local population.	Disturbances can be kept to a minimum with good working practices, planning and timing. Adoption of Construction Best Practice and measures outlined in the CEMP and implementation of traffic and pedestrian management during construction.
Health and Safety risk to the local population during construction works.	Good construction management practices and planning of works. Adoption of Construction Best Practice and measures outlined in the CEMP.
Loss of access to agricultural soil resource.	Consultation and agreement with local landowners on detailed designs and residual impacts of flooding. Potential for requirement for compensation.
Removal of soil and rock material via dredging and excavation works during construction.	Re-use material where possible on site for either embankments or landscaping.
Temporary disturbances of water quality during the construction phase	Good management and planning to keep water quality disturbance to a minimum. Any potential water quality issues from construction should be contained and treated to ensure no damage to natural waterbodies. Dredging and construction will have to be planned appropriately, using Best Available Techniques / Technology (BAT) at all times, to ensure water quality issues are kept to a minimum, with no significant adverse effects. Adherence with guidelines such as CIRIA Document C532 - Control of Water Pollution from Construction Sites.

	Development and consenting of environmental management plan prior to commencement of works.
Potential for pollution incidents during the construction phase.	Minimise requirement for in-water works through good planning. Strict management and regulation of construction activities. Provision of appropriate facilities in construction areas to help prevent pollution incidents. Preparation of emergency response plans. Good work practices including; channelling of discharges to settlement ponds, construction of silt traps, construction of cut-off ditches to prevent run-off from entering waterbodies, hydrocarbon interceptors installed at sensitive areas, appropriate storage of fuel, oils and chemicals, refuelling of plant and vehicles on impermeable surfaces away from drains / waterbodies, provision of spill kits, installation of wheel wash and plant washing facilities, implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste and regular monitoring of surface water quality.
Potential requirement for maintenance dredging.	Design should aim to ensure WFD objectives are not compromised. All options to be subject to a WFD Assessment. Any negative impact on the status of a water body will only be permitted under the WFD if the strict conditions set out in WFD Article 4 are met. Adhering to good work practices including; diversion of discharges to settlement ponds, construction of silt traps, construction of cut-off ditches to prevent run-off from entering excavations, granular materials placed over bare soils. If a channel is maintained on an as-required basis, using good planning, timing and BAT, there should be only minimal temporary disturbance to the local water quality.
Alterations to coastal processes	Detailed surveys and hydrodynamic modelling to inform detailed design of coastal works to ensure no negative impacts on coastal processes.
Disturbances to local infrastructure during the construction phase, e.g. traffic, water and electricity.	Good site management practices, traffic and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice.
In the short term construction period there is the potential for damage to heritage features.	Where necessary a heritage impact assessment should be prepared in respect of any works to architectural or archaeological features to feed into detailed design. Consultation and agreement with Historic Environment Scotland in advance of any works taking place in respect of protected archaeological or architectural features. Construction supervision by qualified project archaeologists, combined with sensitive construction methods and restoration would mean this damage could be kept to a minimum. Heritage features damaged could be restored / preserved. Statutory consents and notices may be required prior to works taking place.
Medium and long term impacts on the setting of heritage features	Impacts could be kept to a minimum through sensitive design and planning. Planning and design advice from qualified archaeologists. Statutory consents may be required prior to works.
Potential for undiscovered heritage to be impacted upon by construction and dredging	Interpretation of side-scan sonar and bathymetry information, along with supervision of construction and dredging operations by qualified archaeologists will minimise any impacts or the

operations.	possibility of destruction of underwater and undiscovered heritage features in areas of heritage potential.
Extent and severity of short term negative impacts on landscape from construction.	Impacts could be kept to a minimum through good site practice and planning (e.g. screened laydown areas and traffic management). Adoption of Construction Best Practice.
Extent and severity of medium to long term negative impacts on landscape from preferred policies.	Impacts could be kept to a minimum through sensitive design and planning (e.g. vegetative screening and landscape management planning). Landscape and visual assessment and advice during detailed design. Public consultation on draft designs.
Restricted access to waterbodies for recreational activities due to preferred policies.	Sensitive design of the shoreline management measures. Potential to improve recreational access, safety of access and improve local recreational and ecological linkages considered in the detailed design. Public and stakeholder consultation on draft designs.
Disturbances to local amenity, community and social infrastructure during the construction phase, e.g. shops and amenity areas.	Good site management practices, traffic and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice.

8.1.3 HRA Mitigation

Table 8.2 demonstrates the HRA mitigation measures that should be adopted within the Plan to minimise the potential for any negative impacts on the European sites as a result of the management of the Ayrshire shoreline.

Table 8.2 Proposed HRA Mitigation Measures

Sub-cell	European Site	Mitigation
6B1	Inner Clyde SPA and Ramsar site	<p>Bird surveys should be undertaken to assess the use of the intertidal zone in this sub-cell by the designated Redshank population of the Inner Clyde SPA. These surveys will provide information as to whether designated Redshank are using these areas for feeding, and to what degree.</p> <p>Should Redshank from the Inner Clyde SPA be using these areas, and the potential for likely significant effects on site integrity exist, any proposed hard coastal defences should be designed in such a way as to limit any potential for coastal squeeze. This could involve setting hard defences further back from the coastline.</p> <p>A more detailed, project level HRA should be undertaken in consultation with SNH once details of the nature and scale of shoreline management measures are known, to more precisely describe the potential impacts of the project and outline any project-level mitigation required. The project-level HRA must conclude 'no adverse effects' upon the Redshank population of the Inner Clyde SPA for the planned works to proceed.</p>
6C6	Ailsa Craig	Bird surveys should be undertaken to assess the use of the intertidal

	SPA	<p>zone in this sub-cell by the designated seabirds of the Ailsa Craig SPA. These surveys will provide information as to whether the designated seabirds are using these areas for feeding, and to what degree.</p> <p>Should any of the designated species be using these areas, and the potential for likely significant effects on site integrity exist, any proposed hard coastal defences should be designed in such a way as to limit any potential for coastal squeeze. This could involve setting hard defences further back from the coastline.</p> <p>A more detailed, project level HRA should be undertaken in consultation with SNH once details of the nature and scale of shoreline management measures are known, to more precisely describe the potential impacts of the project and outline any project-level mitigation required. The project-level HRA must conclude 'no adverse effects' upon the designated seabird populations of the Ailsa Craig SPA for the planned works to proceed.</p>
	Lendalfoot Hills Complex SAC	Careful planning of any future A77 road relocation scheme by Transport Scotland should ensure no significant impacts on this site.
6D1	Ailsa Craig SPA	<p>Bird surveys should be undertaken to assess the use of the intertidal zone in this sub-cell by the designated seabirds of the Ailsa Craig SPA. These surveys will provide information as to determine whether the designated seabirds are using these areas for feeding, and to what degree.</p> <p>Should any of the designated species be using these areas, and the potential for likely significant effects on site integrity exist, any proposed hard coastal defences should be designed in such a way as to limit any potential for coastal squeeze. This could involve setting hard defences further back from the coastline.</p> <p>A more detailed, project level HRA should be undertaken in consultation with SNH once details of the nature and scale of shoreline management measures are known, to more precisely describe the potential impacts of the project and outline any project-level mitigation required. The project-level HRA must conclude 'no adverse effects' upon the designated seabird populations of the Ailsa Craig SPA for the works to be progressed.</p>

8.2 MONITORING

The SEA Directive requires that the significant environmental effects of the implementation of a SMP are monitored in order to identify, at an early stage, unforeseen adverse effects and in order to undertake appropriate remedial action. Proposed monitoring indicators, data and responsible authorities for the Ayrshire SMP are given in **Table 8.3**, based on the Targets and Indicators established in the SEOs (given in **Section 3.2**). This proposed monitoring has been incorporated in Section 7.2 of the SMP and will be undertaken during the feasibility, design and construction phases of any resulting works. This monitoring will report the positive and negative impacts on the environment of implementing the SMP, enabling early mitigation for any unwanted impacts and improving future iterations of the SMP.

Detailed monitoring for specific policies proposed should be re-scoped in consultation with the appropriate authorities at the detailed feasibility and design stages. This agreed detailed monitoring should then be undertaken before, during and after construction, where and when appropriate.

Table 8.3 Environmental Monitoring of the SMP

Criteria	Objective	Sub-Objective	Indicators	Possible Data and Responsible Authority
Biodiversity, Flora & Fauna	1 Avoid damage to, and where possible enhance, the biodiversity, flora and fauna in the vicinity of the shoreline.	A Avoid detrimental effects to, and where possible enhance, International and European designations for protected species and their key habitats.	Areas of SAC, SPA, WHS and Ramsar designation. Numbers of protected species.	SNH, UNESCO & Marine Scotland reporting and action plans.
		B Avoid damage to or loss of, and where possible enhance, national and local nature conservation sites and protected species, or other know species of conservation concern.	Areas of SSSI, LNRs, MCAs and local conservation designations. Numbers of protected species.	SNH, UNESCO & Marine Scotland reporting and action plans. North Ayrshire Council and South Ayrshire Council – Local Development Plans.
Population & Human Health	2 Protect the public from risk of flooding and coastal erosion.	A Protect the public from risk of flooding and coastal erosion.	Population at risk of flooding and erosion.	SEPA reporting. North Ayrshire Council and South Ayrshire Council – Flood Risk Management Plans. Scotland Census Data
Geology, Soils and Landuse	3 Maintain or improve areas of existing functional soil and land resource.	A Maintain or improve areas of existing functional soil and land resource.	Areas of functional soil and land resource at risk of flooding and erosion.	SNH erosion reporting. SNH landcover mapping North Ayrshire Council and South Ayrshire Council –land use zoning in Local Development Plans.
Water	4 Protect and enhance the state of the water environment.	A Protect and enhance the state of the water environment.	Coastal morphology and waterbody status.	SEPA – River Basin Management Plans / WFD reporting.
Climatic Factors	5 Adaptation to potential climatic change.	A Adaptation of shoreline management to potential climatic change.	Interaction with potential climate change influenced flood extents / wave overtopping and severe weather events.	SEPA reporting. North Ayrshire Council and South Ayrshire Council – Flood Risk Management Plans.
Material Assets &	6 Protect material assets and	A Protect material assets and infrastructure from risk of	Material assets and	SEPA reporting. Transport Scotland

Criteria	Objective	Sub-Objective	Indicators	Possible Data and Responsible Authority
Infrastructure	infrastructure from risk of flooding and coastal erosion.	flooding and coastal erosion.	infrastructure at risk from flooding and erosion.	Scottish Water North Ayrshire Council and South Ayrshire Council reporting.
Cultural, Architectural & Archaeological Heritage	7 Protect or enhance historic environment features and their settings.	A Avoid loss of, or damage to, heritage features.	International, National and local designated heritage structures, sites and monuments.	North Ayrshire Council and South Ayrshire Council reporting. Historic Environment Scotland Reporting Canmore Database
		B Minimise effects on the setting of heritage features.		
Landscape & Visual Amenity	8 Protect, and where possible enhance the landscape character and visual amenity of the Ayrshire shoreline.	A Protect, and where possible enhance the landscape character and visual amenity of the Ayrshire shoreline.	Landscape character assessments. Designated landscapes and views.	North Ayrshire Council and South Ayrshire Council – Local Development Plans. SNH landcover mapping

9 SUMMARY AND CONCLUSIONS

This SEA Environmental Report has been prepared to provide a formal and transparent assessment of the likely significant impacts on the environment arising from the SMP, including consideration of reasonable alternatives. As the SMP has the potential to impact upon European sites, the requirement exists under the EU Habitats Directive to carry out an HRA.

This SEA Environmental Report has identified the potential positive and negative impacts on the wider environment of the proposed policies to manage the Ayrshire shoreline. This report is designed to help support the decision making with regard to the SMP, to ensure that North Ayrshire Council and South Ayrshire Council are fully aware of the environmental constraints and opportunities associated with these proposed policies, and to help the future sustainable development of projects and schemes which are the result of the SMP.

Section 8 of this SEA Environmental Report details the environmental assessment of these preferred policies. Generally there was found to be the potential for slight to moderate negative environmental impacts from construction of these preferred engineering policies on the wider environment, with one exception of significant negative impacts; however in the medium to long term, following the completion of works and the re-establishment of areas, the impacts are generally significantly positive with only minor residual negative impacts identified. These medium to long term, positive impacts are anticipated due to the increased management of flood and erosion risk for the protection of people, property, water quality, heritage features and infrastructure.

Section 9 of this SEA Environmental Report recommends environmental mitigation measures to avoid or minimise these potential negative impacts of implementing the engineering policies. It is recommended that these measures are adopted in full at the next detailed stage of design and assessment of these preferred options.

This HRA details the findings of the Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the policies in the draft SMP on the following European sites:

- Ailsa Craig SPA,
- Inner Clyde SPA and Ramsar site, and
- Lendalfoot Hills Complex SAC

The Appropriate Assessment concluded that there is no potential for impacts on the site integrity of Lendalfoot Hills Complex SAC arising from the policies of the Ayrshire SMP, as the footprint of shoreline management defences will not be located within the SAC boundaries. In the case of Ailsa Craig SPA and Inner Clyde SPA, further information needs to be gathered through surveys at the project stage to allow an informed assessment of the use of the intertidal zone within certain policy units by the designated species. Should this information demonstrate that potential for likely significant effects on site integrity exists; any proposed hard coastal defences should be designed in such a way as to limit any potential for coastal squeeze.

On the basis of the proposed high level policies of the SMP, and information on Natura sites in the zone of influence, it has been concluded that, provided the proposed mitigation measures are implemented, the Ayrshire SMP will not give rise to any adverse effects on the integrity of any Natura site. Further assessment should be undertaken at project level, when detailed information on shoreline management measures are available.

Section 9 also details environmental monitoring to be undertaken during development of the 2nd cycle of the SMP. This should identify at an early stage any unforeseen adverse effects due to implementation of the SMP. This environmental monitoring has been adopted into Section 7 of the draft SMP.

10 NEXT STEPS

Consultation on the draft Plan, SEA Environmental Report and HRA are anticipated to commence in January 2018 and run for 12 weeks. The consultation activities will take the form of Public Consultation Days, documents being made available for viewing at North Ayrshire Council and South Ayrshire Council premises and via their respective websites.

Following completion of the consultation period, all comments will be collated and the Plan, SEA Environmental Report and AA Screening will be reviewed and revised as necessary. Provided that there are no objections or comments that will significantly alter the Plan, the final version of the Plan can be drafted and adopted. This is anticipated to be in late 2017. Following release of the adopted Ayrshire SMP, an SEA Statement will be drafted to summarise the process undertaken and identify how environmental considerations and consultations have been integrated into the final Plan. **Table 10.1** demonstrates the proposed upcoming time stages for the Plan, SEA and AA.

Table 10.1 Draft Anticipated Milestones

Ayrshire Shoreline Management Plan	Dates	Strategic Environmental Assessment / Appropriate Assessment
Development of Ayrshire Shoreline Management Plan	July 2016 – Nov 2017	Strategic Environmental Assessment and Appropriate Assessment. Writing of SEA Environmental Report and AA Screening.
Public and statutory consultation on draft Ayrshire Shoreline Management Plan	Jan - Mar 2018	Statutory, Non Statutory and Public Consultation on SEA Environmental Report and AA Screening.
Release of Final Ayrshire Shoreline Management Plan	Apr 2018	SEA Environmental Statement

The proposed timescale to complete the SEA process is given in **Table 10.2**.

Table 10.2 Proposed Timescale for SEA of the Ayrshire Shoreline Management Plan

Actions	Timescales
Scoping	April – July 2016
Consultation	July – August 2016
Environmental Assessment	August 2016 – Nov 2017
Public Consultation	Jan 2018 - Mar 2018
Environmental Statement	Apr 2018

The contact for any information regarding the Strategic Environmental Assessment of the proposed Ayrshire Shoreline Management Plan is as follows:

By post	Danielle King RPS Consulting Engineers Ocean Point One, 4 th Floor, 94 Ocean Drive, Edinburgh.
By email	danielle.king@rpsgroup.com

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Appendix A

SEA Screening Responses

Historic Environment Scotland Screening Response



By email to: sea.gateway@gov.scot

Ms Patricia Rowley
Planning Services
North Ayrshire Council
Cunninghame House
IRVINE
KA12 8EE

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131-668-8716
HMConsultations@hes.scot

Our ref: AMN/23/83
Our Case ID: 201603083
Your ref: 01224 SCREENING
29 September 2016

Dear Ms Rowley

Environmental Assessment (Scotland) Act 2005 North Ayrshire Council - Ayrshire Shoreline Management Plan Screening Report

Thank you for your consultation which we received on 06 September about the above screening report. We have reviewed the screening report in our role as a Consultation Authority under the above Act, in accordance with the requirements of Section 9(3). In doing so we have used the criteria set out in Schedule 2 for determining the likely significance of the effects on the environment. Please note that our view is based on our main area of interest for the historic environment.

My understanding from the screening report is that a plan is to be prepared that sets out the high-level approach to the management of the Ayrshire shoreline including baseline information and alternative policy approaches to the management of individual sections of the coastline. I note that it is the Council's view that significant environmental effects as a result of the plan are likely. In light of the information contained within the screening report I agree that significant effects on the historic environment as a result of the plan are likely. In terms of the preparation of the shoreline management plan and its assessment we would be happy to work with you on this and can offer advice on baseline, research and specific historic environment issues.

However, as you will be aware, it is the responsibility of North Ayrshire Council as the Responsible Authority to determine whether the plan requires an environmental assessment and to inform the Consultation Authorities accordingly.

We hope this is helpful. Please contact us if you have any questions about this response. The officer managing this case is Andrew Stevenson and they can be contacted by phone on 0131 668 8960 or by email on andrew.stevenson2@hes.scot.

Yours sincerely

Historic Environment Scotland

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. **GB 221 8680 15**

Scottish Natural Heritage Screening Response



Scottish Natural Heritage Dualchas Nàdair na h-Alba

All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Ms P Rowley
North Ayrshire Council
Cunninghame House
Irvine
KA12 8EE

07 September 2016
Our ref: CEA142801

Dear Ms Rowley

Environmental Assessment (Scotland) Act 2005: Ayrshire Shoreline Management Plan Screening Determination

I refer to your screening consultation submitted on 5 September 2016 via the Scottish Government SEA Gateway in respect of the above plan.

In accordance with Section 9(3) of the Environmental Assessment (Scotland) Act 2005, SNH has considered your screening report using the criteria set out in Schedule 2 for determining the likely significance of effects on the environment.

We agree that as the plan sets the framework for future shoreline works along the Ayrshire coastline these could give rise to likely significant environmental effects. We would welcome the opportunity to discuss with North Ayrshire Council the scoping of the SEA once further details of the plan have been determined.

Please note that this consultation response provides a view solely on the potential for the plan or programme to have significant environmental effects. We cannot comment on whether or not the plan or programme meets other criteria determining the need for SEA as set out in the Act.

Should you wish to discuss this screening determination, please do not hesitate to contact me on 0141 951 4488 or email kerry.wallace@snh.gov.uk or via SNH's SEA Gateway at sea.gateway@snh.gov.uk

Yours sincerely,

KERRY WALLACE (via email)
Unit Manager
Strathclyde & Ayrshire

cc. sea.gateway@gov.scot
sea_gateway@snh.gov.uk
sea.gateway@sepa.org.uk
sea.gateway@hes.scot

Scottish Environment Protection Agency Screening Response



Our ref: PCS/148883
SG ref: SEA/01224/scr

Patricia Rowley
North Ayrshire Council
Cunninghame House
Irvine
Scotland
KA12 8EE

If telephoning ask for:
Nicki Dunn

13 September 2016

By email only to: sea.gateway@scotland.gsi.gov.uk

Dear Madam

Environmental Assessment (Scotland) Act 2005 Ayrshire Shoreline Management Plan - Screening Report

Thank you for your Screening Report consultation which SEPA received via the Scottish Government SEA Gateway on 6 September 2016.

In accordance with Section 9(3) of the Environmental Assessment (Scotland) Act 2005 we have considered your screening report using the criteria set out in Schedule 2 for determining the likely significance of effects on the environment. Having reviewed the Screening Report, we consider that in respect of our main areas of interest (air, water, soil, human health, material assets (of which we have a specific interest in waste) and climatic factors) the Plan is likely to have significant environmental effects.

Although we are of the view that significant environmental effects are likely, it is for the Responsible Authority to make a formal determination taking into account the consultation responses received. If it is formally determined that SEA is required, you will be aware that the next stage requires the Responsible Authority to consult the Consultation Authorities on the proposed scope and level of detail to be included within the Environmental Report. This can be undertaken through preparation of a concise Scoping Report.

We would encourage you to use the scoping process to focus the assessment on those SEA issues upon which there are likely to be significant environmental effects, to outline the baseline information you consider as most relevant and explain your proposed method of assessment. To assist with this process we have produced [Standing Advice for Responsible Authorities on Strategic Environmental Assessment \(SEA\) Scoping Consultations](#).

We are committed to providing early and focused advice and supporting continuous engagement and would therefore welcome the opportunity to meet with you and discuss these issues prior to the formal consultation. Further information can be found in the [Scottish Government SEA Guidance](#).

A:

Should you wish to discuss this screening consultation please do not hesitate to contact me on 01698 839000 or via our SEA Gateway at sea.gateway@sepa.org.uk.

Yours sincerely

Nicki Dunn
Senior Planning Officer

Ecopy: sea.gateway@hes.scot; sea_gateway@snh.gov.uk

SEA Gateway Screening Response

Local Government and Communities Directorate

Planning and Architecture Division

T: 0131-244 7650 F: 0131-244 7555

E: Johnathan.Whittlestone@gov.scot

D:

Richard Bingham

RPS group

Elmwood House

74 Boucher Road

Belfast

BT12 6RZ

01224 Screening - North Ayrshire Council - Ayrshire Shoreline Management Plan

Dear Richard,

With reference to the Screening document you submitted on 06 September 2016.

The Consultation Authorities have now considered your screening request as per **Section 9(3)** of the **Environmental Assessment (Scotland) Act 2005**. For convenience I have set out, in the table below, their individual views on whether there is a likelihood of significant environmental effects.

Please note, these are the views and opinions of the Consultation Authorities on the likelihood of significant environmental effects arising from the plan or programme and not a judgement on whether an SEA is required. It is therefore for the Responsible Authority to determine whether an SEA is required in the circumstances. I have attached the individual letters from the Consultation Authorities, outlining their views and opinions. Where possible the Consultation Authorities may have offered supplementary information and/or advice for you to consider, which you should find helpful.

CONSULTATION AUTHORITY	LIKELIHOOD OF SIGNIFICANT ENVIRONMENTAL EFFECTS
Historic Environment Scotland	Yes
Scottish Environment Protection Agency	Yes
Scottish Natural Heritage	Yes

OVERALL VIEW ON LIKELIHOOD OF SIGNIFICANT ENVIRONMENTAL EFFECTS	Yes
--	------------

As the Consultation Authorities have now notified you of their views, you should now refer to the 2005 Act to consider your next step. You should of course take into account the advice offered by the Consultation Authorities.

You should note, as per Section 10 of the 2005 Act, within 28 days of your determination about whether an SEA is required or not, a copy of the determination and any related statement of reasons must be passed to the Consultation Authorities. This may be done via the SEA Gateway.

If you have any queries or would like me to clarify any points, please call me on 0131 244 7650.

Yours sincerely

Johnathan Whittlestone

SEA Gateway Officer

APPENDIX B
SEA Guidance

Scottish Government guidance on Strategic Environmental Assessment. August 2013. Scottish Government. <http://www.gov.scot/Publications/2013/08/3355/0>

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Air. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Soil. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

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APPENDIX C
SEA Scoping Responses

SEPA SEA Scoping Response



Our ref: PCS/152713
SG ref: SEA/01224/SCO

If telephoning ask for:
Simon Watt

25 May 2017

Richard Bingham
RPS Consulting Engineers
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

By email only to: SEA_Gateway@gov.scot

Dear Sir

Environmental Assessment (Scotland) Act 2005
Ayrshire Shoreline Management Plan - Scoping consultation

Thank you for your Scoping consultation submitted under the above Act in respect of the Ayrshire Shoreline Management Plan. This was received by SEPA via the Scottish Government SEA Gateway on 24 April 2017.

As required under Section 15(2) of the Act, we have considered the document submitted and comment as follows in respect of the scope and level of detail to be included in the Environmental Report (ER). Subject to the comments in Appendix 1 below we are generally satisfied with the proposed scope and methodology of the assessment.

The [Scottish Government SEA Guidance](#) provides guidance to Responsible Authorities about the type of information that is expected to be provided at each SEA stage; we have also produced [SEA topic guidance](#) for those issues which fall within our remit. We have used the guidance to inform our detailed scoping response which is attached as an appendix.

On completion, the Environmental Report and the plan to which it relates should be submitted to the Scottish Government SEA Gateway (SEA_Gateway@gov.scot) which will forward it to the Consultation Authorities.

Should you wish to discuss this scoping consultation, please do not hesitate to contact me on 01698 839 000 or via our SEA Gateway at sea.gateway@sepa.org.uk

Yours sincerely

Simon Watt
Senior Planning Officer
Planning Service

Ecopy: sea.gateway@hes.scot; sea_gateway@snh.gov.uk



Chairman
Bob Downes

Chief Executive
Terry A'Hearn

Angus Smith Building

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Appendix 1: Comments on the scoping consultation

1. Relationship with other Plans, Policies and Strategies (PPS)

Is there any information missing from the key plans and programmes listed in Table 2.1 or Appendix C, relevant to the Ayrshire SMP, that you think should be included, and why?

- 1.1 We consider that the PPS listed in Table 2.2 and Appendix C is a good basis for providing a background framework to the development of the plan. As you undertake the full and comprehensive review of relevant PPSs as part of the SEA process we recommend you refer to our [standing advice on SEA scoping](#) and topic specific guidance on air, soil, water, material assets and human health, available through our [website](#), which includes reference to other PPS which may be relevant to the plan.
- 1.2 You may wish to consider including the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) as this applies regulatory control over activities which may affect Scotland's water environment including rivers, lochs, transitional waters (estuaries), coastal waters, groundwater and groundwater dependent wetlands.
- 1.3 We note that reference is made to river basin management plans and would highlight that the relevant plan for this area is [The River Basin Management Plan for the Scotland River Basin 2015 – 2027](#). Further information is also available on the Ayrshire Flood Risk Management Strategy on our [website](#).
- 1.4 Some of the PPS included have themselves been subject to SEA. Where this is the case you may find it useful to prepare a summary of the key SEA findings that may be relevant to the plan. This may assist you with data sources and environmental baseline information and also ensure the current SEA picks up environmental issues or mitigation actions which may have been identified elsewhere.

2. Scoping for the Ayrshire Shoreline Management Plan

Do you agree with the geographical and temporal scope of the assessment?

Do you agree with the scoping of the environmental assessment topics?

Have we identified all the key environmental issues relevant to the Ayrshire SMP?

- 2.1 We are satisfied with the intention to scope out air from the assessment and agree the remaining topics should be scoped into the assessment. However, there may be opportunities to rationalise these during the course of the assessment if it becomes clear that no significant effects on a topic are likely. We also have no concerns with the geographical and temporal scope of the assessment at this stage however it again may be possible to refine or broaden the assessment as further information becomes available.
- 2.2 Table 3.1 indicates that options for shoreline management are not going to be assessed within the SEA. We would remind you that reasonable alternatives should be considered as part of the plan preparation, and the findings of their assessment should inform the choice of the preferred option. It is not clear whether the options set out in this section of the plan will be considered as alternatives. If so, it is our view that these should be considered within the assessment.

3. Baseline and Environmental Problems

Are we proposing the most appropriate data and scale of data to be used?

Can you propose any other data to be used in the SEA and why it would be beneficial?

- 3.1 We hold significant amounts of environmental data which may be of interest to you in preparing the environmental baseline, identifying environmental problems, and summarising the likely changes to the environment in the absence of the PPS, all of which are required for the assessment. Many of these data are now readily available on SEPA's website.
- 3.2 We recommend that reference is made to our [guidance](#) which includes references to other sources of data and issues you may find relevant to the topic areas within our remit. Additional local information may also be available from our Access to Information unit at our Corporate Office (Telephone 01786 457700 or email dataenquiries@sepa.org.uk).
- 3.3 You may also find [Scotland's Dynamic Coast](#) to be a useful source of information in the context of this assessment.

4. Framework for Assessing Environmental Effects

Do you agree with the approach to the assessment?

Do you agree with the draft SEA objectives?

- 4.1 We support the use of SEA objectives, as proposed, as assessment tools as they allow a systematic, rigorous and consistent framework with which to assess environmental effects.
- 4.2 We note that the risk of coastal flooding and erosion is to be considered under population and human health. Whilst we recognise that the plan is focussing on the coastal zone, it is our view that the assessment should consider all forms of flooding as there may be an inter-relationship between different sources of flooding. It is also important that options presented as part of the plan do not result in negative impacts on flooding elsewhere. We therefore recommend that this is reflected in updated assessment objectives. Given this, and the nature of the plan, it may be more appropriate to include an objective 'To reduce the risk of flooding'. Indicators can still be included to assess the implications on population and human health e.g. Properties at risk from flooding within the plan area (number).
- 4.3 We also recommend that the objective for water is updated to 'To protect and enhance the state of the water environment' rather than 'minimise impacts...'. Likewise, we recommend that the soil objective is revised to 'maintain or improve areas of existing functional soil and land resources' rather than 'protect...'. These changes will allow to improvement of these issues to be assessed as well as protection.
- 4.4 When it comes to setting out the results of the assessment in the Environmental Report (ER) please provide enough information to clearly justify the reasons for each of the assessments presented. It would also be helpful to set out assumptions that are made during the assessment and difficulties and limitations encountered. However, like Historic Environment Scotland, we would caution against the use of a balancing or aggregate approach to the assessment.

Scottish Natural Heritage Scoping Response



Mr Johnathan Whittlestone
Planning & Architecture
Scottish Government
EDINBURGH

Our Ref: CNS/SEA/SSEA
Your Ref: 01224

Dear Sirs

01224 Scoping – North Ayrshire Council – Ayrshire Shoreline Management Plan

Thank you for consulting Scottish natural Heritage over the above scoping report. I have reviewed the report and have addressed the questions you raised below. The numbering relates to the questions you raise in the consultation document.

1. SNH holds survey data on a range of sensitive coastal habitats which may be of use to the plan preparation. Eg. The Sand dune survey of Scotland 1998. This survey is a complete coverage of sand dune habitats and is not restricted to specially protected sites. In addition we hold survey information on saltmarsh and a number of shingle formations.
2. We agree with the approach set out however it would be useful if there was some narrative which explains why some of the off-shore islands are not included in the plan.
3. Agree
4. When considering the coastal material assets and infrastructure, it may be worth drawing attention to larger harbours (Harbours Act) and other port/marina facilities. These are important coastal features which can influence the surrounding coast but they are also a potential source of material for beach nourishment projects.
5. See the response to question 1 re other data sets which may be useful.
6. See the response to question 1 re other data sets which may be useful.
7. Agree. However, given the lifespan of the plan it may prudent to include intermittent reviews of the baseline conditions (possibly every ten years).

Scottish Natural Heritage, Russell House, King Street, AYR, KA8 0BF: Tel No: 01292 270760: www.snh.gov.uk
Dualchas Nàdair na h-Alba, Taigh Russell, Sràid an Rìgh, Inbhir Àir, KA8 0BF Fòn: 01292 270760
www.snh.gov.uk/gaelic

8. Agree, A and B are focussed on the potential impacts on habitats within protected sites only. It should recognise the existence of sensitive habitats and protected species in the wider coastal habitat.
9. Agree with the project timescales as set out.

Should you wish clarify any of the matters raised above, please do not hesitate to get in touch.

Yours faithfully

GRAEME WALKER
Area Officer
Ayrshire and Arran
Strathclyde and Ayrshire

cc sea.gateway@sepa.org.uk; sea.gateaway@hes.scot; sea.gateway@snh.gov.uk

Historic Environment Scotland Scoping Response



By email to: sea.gateway@gov.scot

RPS Group
Consulting Engineers
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131-668-8716
Switchboard: 0131 668 8600
HMConsultations@hes.scot

Our ref: AMN/23/83
Our case ID: 300020098
Your ref: 01224 Scoping
25 May 2017

Dear Sir/Madam

Environmental Assessment (Scotland) Act 2005
North Ayrshire Council - Ayrshire Shoreline Management Plan
Scoping Report

Thank you for your consultation which we received on 24 April 2017 about the above scoping report. We have reviewed this in our role as a Consultation Authority under the above Act. This letter contains our views on the scope and level of detail of the information to be included in the Environmental Report. Please note that our view is based on our main area of interest for the historic environment.

Scope and level of detail

It is our understanding that the Ayrshire Shoreline Management Plan will consider the risks associated with coastal processes, and identify measures to manage these risks. We note that the historic environment has been scoped into the assessment. On the basis of the information provided, we are content with this approach and are satisfied with the scope and level of detail proposed for the assessment, subject to the detailed comments provided in response to the questions asked within the scoping report. As a general point we would ask that all references to Historic Scotland are updated to Historic Environment Scotland.

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. **GB 221 8680 15**



1) Is there any information missing from the key plans and programmes listed, relevant to the Ayrshire SMP, that you think should be included, and why?

Yes. Our Place in Time – The Historic Environment Strategy for Scotland¹ is the high level framework sets out the 10 year vision for the historic environment. The plan should have regard for the vision, principles and priorities of this strategy. It is also unclear what the “Heritage Plans” refers to in the regional/sub-regional section.

2) Do you agree with the geographical and temporal scope of the assessment?

Yes.

3) Do you agree with the scoping of the environmental assessment topics?

Yes. We welcome that the historic environment has been scoped into the assessment.

4) Have we identified the key environmental issues relevant to the Ayrshire SMP?

The identification of environmental awareness issues for the cultural heritage topic is beneficial as is the cross-cutting historic environment issues relating to landscape and visual considerations. It is important that these environmental awareness issues should also cover the potential for effects on the setting of historic environment assets. Further detail on setting can be found in our Managing Change Guidance Note² on Setting. In noting the presentation in Table 3.3 of the potential inter-relationships between SEA Topics we would suggest that there is inter-relationship between Climatic Factors and the historic environment. Increased floods, storms, wetting etc. of historic environment assets is a significant pressure on the fabric of this resource and as such it will be important for the assessment to recognise how the plan will serve to adapt and mitigate these effects.

5) Are we proposing the most appropriate data and scale of data to be used?

Up-to-date spatial information on Listed Buildings, Scheduled Monument, Gardens and Designed Landscapes, Battlefields, Historic Marine Protection Areas, Conservation Areas, World Heritage Sites, Properties in Care and the Historic Landuse Assessment can be found at <http://portal.historicenvironment.scot/spatialdownloads>. Information on undesignated historic environment assets can be supplied by the relevant local authorities.

¹ <http://www.gov.scot/Resource/0044/00445046.pdf>

² <https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes/>

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH

Scottish Charity No. **SC045925**

VAT No. **GB 221 8680 15**



6) Can you propose any other data to be used in the SEA and why it would be beneficial?

No.

7) Do you agree with the approach to the assessment?

The discussion based approach to describing environmental effects is welcomed and it would be beneficial for this to include discussion of potential mitigation measures for identified significant effects. However, in relation to the proposed Description of Environmental Scores as presented in Table 5.2 it is unclear what criteria will be used in determining the level of effects with regard to assigning an effect to 3 grades of positive/negative effects. More commonly practiced within strategic environmental assessment is a system whereby effects are categorised as either positive/negative or significant positive/negative as this approach more clearly defines the level of effect in terms of significance and would aid professional judgement based decision making.

We would also urge caution when applying a “balancing” or aggregate approach to assessment. While it is important to consider the effects across environmental topics, care should be taken to ensure that significant effects continue to be appropriately addressed and not simply balanced off by an opposite significant effect relating to another environmental topic. Furthermore, when considering the proposed approach of aggregating scores across environmental and non-environmental topics it should be remembered that the purpose of the assessment is to clearly identify significant environmental effects and use these outputs to influence decisions relating to the constituent elements of the plan. In light of this the scoring approach of calculating a score based on a combination of environmental and may lead to confusion in the reporting of the actual environmental implications of any given approach. The comments relating to assigning scores of -999 to unacceptable effects could potentially add confusion regarding the significance of effects. Such unacceptable effects could be considered not to be reasonable alternatives and therefore not part of the assessment.

The assessment should also provide a predicted level of effect both before and after mitigation is applied.

8) Do you agree with the draft SEA objectives?

The effects of any proposed works etc. on the setting of historic environment assets should also be assessed. Therefore it is important that the SEA objectives for the historic environment address both the potential direct and indirect effects of proposals on the historic environment resource. In light of this you may wish to alter the objective to

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SEA Objective

Protect or enhance historic environment features and their settings

SEA Sub-Objective

- A. Avoid loss of or damage to heritage features
- B. Minimise effects on the setting of heritage features

The aspirational target of increasing the protection and preservation for heritage features is particularly welcomed.

In terms of monitoring the predicted effects of the plan we welcome the early consideration given to this important aspect of strategic environmental assessment and look forward to further details on this as your assessment progresses.

Consultation period for the Environmental Report

9) Do you agree with the proposed project timescales and proposed consultees in the SEA process?

While no specific timescale in terms of weeks has been provided we note that is the intention to consult on the environmental report between June and August 2017. We would advise a minimum of at least 6 weeks for this consultation.

Please note that, for administrative purposes, we consider that the consultation period commences on receipt of the relevant documents by the SEA Gateway.

We hope this is helpful. Please contact us if you have any questions about this response. The officer managing this case is Andrew Stevenson who can be contacted by phone on 0131 668 8960 or by email on andrew.stevenson2@hes.scot.

Yours faithfully

Historic Environment Scotland

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APPENDIX D

Stakeholder Scoping Responses

Ayrshire Rivers Trust	<ul style="list-style-type: none"> - Latest alteration to the mouth of the River Stinchar took place in 2013. - Migratory trout common to all Ayrshire Rivers. - Sedimentation resulting in management means such as dredging may lead to degradation of marine habitats. Reducing this type of sediment loss/deposition should be a priority.
Firth of Clyde Forum	<ul style="list-style-type: none"> - The coast should be managed flexibly to allow for the uncertainties of the future impacts of sea-level rise and storminess on the shoreline. - Reference to GEN 5 climate change on page 18-19 and GEN 8 on page 22-23 at: http://www.gov.scot/Publications/2015/03/6517
Royal Troon Golf Club	<ul style="list-style-type: none"> - All the land within the ownership of the RTGC south of the Gyaws Burn lies within an SSSI (extending 150 hectares). - The RTGC enjoys gold level standard certification under the Golf Environment Organisation. - Coastal protection works undertaken primarily comprised of chespaie sand fencing and the installation of stone filled containers. - In the late 1980's/early 1990's various remedial measures were implemented to regenerate and stabilise dunes however repeat severe storms resulted in continued loss of ground. Remedial measures include sand traps fencing and netting, gabion wire baskets and plastic Georgia mesh. - Formal monitoring regime in place – annual inspection and monitoring survey of coastal dynamics. - “Coastal erosion at RTGC is fairly latent at least through certain sections with little obvious change being noted over the 5 year term. Certain sections of the coastline however are not recovering following protection against seawater

	<p>inundation”.</p> <ul style="list-style-type: none"> - Another key issue highlighted in the report is the repositioning of the mouth of the Pow Burn, where the sandpit on the south side of the burn is accreting which is pushing the burn northwards with impacts on the dune system to the south of the 6th green. - RTGC commissioned STRI Ecology and Environment to prepare a Coastal Management Plan. Various surveys will be undertaken as part of the study... these include botanical and winter bird surveys in addition to extensive desk top surveys.
Whiting Bay and Districts Improvement Association	<ul style="list-style-type: none"> - The area between Sandbraes and Glen Ashdale burn is subject to erosion - Sandbrae Park, the main amenity, play and sport area of the village, stretches down to the beach but access from the beach has been eroded away and sand dunes have disappeared. - Opposite the school, the road and pavement are closely adjacent to the beach and are being eroded so that, in places, there is little banking left. - Further south, gabions protect a parking area and a sea wall extended to the south. While the wall appears to be holding the sea back there have been times when it was breached and holes have appeared in the road. At high tides, the waves often come over the wall and can flood the other side of the road. <p>Coastal erosion appears to be getting worse and at a much faster rate than in the past.</p>
Western Gables Golf Club	<ul style="list-style-type: none"> - A limited number of large concrete pipes are supporting the dunes. The pipes are filled with sand. A local company looked to fortify some of the dunes with gabions. - High tides in winter can give rise to sea water encroaching around the area of the burn at the south end of the golf course. Depth estimated to be up to around

	<p>three feet in and around the burn area. This can give rise to sedimentation.</p> <ul style="list-style-type: none">- A proportion of the dunes has been lost over the years and this would apply to the full extent of the course shoreline.- Part of the golf course lies on an SSSI.
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APPENDIX E

Plans and Programmes

EUROPEAN

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
<i>Biodiversity, Flora and Fauna</i>				
The EU Birds Directive 2009/147/EC	Protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors.	<ul style="list-style-type: none"> • Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I. • Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes • Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of international importance. 		<p>The Ayrshire SMP should ensure that European Sites are suitably protected from loss or damage.</p> <p>The Ayrshire SMP is expected to require a screening for Appropriate Assessment, following which there may be requirement for a Natura Impact Statement to ensure that any strategies proposed do not adversely affect SPAs and SACs.</p>
The EU Habitats Directive (92/43/EEC)	Builds on the Birds Directive (see above) by protecting natural habitats and other species of wild plants and animals. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds Directive) and Special Areas of Conservation (SACs, classified under	<ul style="list-style-type: none"> • Propose and protect sites of importance to habitats, plant and animal species. • Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to 		

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
	the Habitats Directive).	<p>be maintained or, where appropriate, restored at a favourable conservation status in their natural range.</p> <ul style="list-style-type: none"> • Carry out comprehensive assessment of habitat types and species present. • Establish a system of strict protection for the animal species and plant species listed in Annex IV. 		
The EU Biodiversity Strategy to 2020 [COM(2011)244] “Our life insurance, our natural capital”	<p>Aimed at reversing biodiversity loss and speeding up the EUs transition towards a resource efficient and green economy. Primary objectives of the strategy include:</p> <ul style="list-style-type: none"> • conserving and restoring nature; • maintaining and enhancing ecosystems and their services; • ensuring the sustainability of agriculture, forestry and fisheries; • Ensuring the sustainable use of fisheries resources • combating invasive alien species; and • addressing the global biodiversity crisis. 	<ul style="list-style-type: none"> • To mainstream biodiversity in the decision making process across all sectors. • To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity. • To increase awareness and appreciation of biodiversity and ecosystems services. • To conserve and restore biodiversity and ecosystem services in the wider countryside. • To conserve and restore biodiversity and ecosystem. • services in the marine environment • To expand and improve on the management of protected areas and legally protected species. • To substantially strengthen the effectiveness of International governance for biodiversity and ecosystem services. 		The Ayrshire SMP should have regard for this strategy and look for opportunities to conserve, and, where possible, restore or enhance biodiversity.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
(Ramsar) Convention of Wetlands of International Importance especially as Waterfowl Habitat (1971)	<ul style="list-style-type: none"> Framework for international cooperation in relation to the conservation and wise use of wetlands through local and national actions as a contribution towards achieving sustainable development throughout the world. 	<p>Contracting Parties commit to:</p> <ul style="list-style-type: none"> Work towards the wise use of all their wetlands; Designate suitable wetlands for the list of Wetlands of International Important (the "Ramsar List") and ensure their effective management; Cooperate international on transboundary wetlands, shared wetland systems and shared species. 	The Fourth Ramsar Strategic Plan 2016 – 2024.	The Ayrshire SMP will have regard for the protection of wetlands and shall seek to, at very least, prevent negative impacts to wetlands.
The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or "The Bonn Convention" [L210, 19/07/1982 (1983)])	The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range.	<ul style="list-style-type: none"> Establishes a legal foundation for internationally coordinated conservation measures throughout a migratory range. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. In Europe, legislation to ensure that the provisions of the Bonn convention are applied includes the Birds Directive and the Habitats Directive. 		The Ayrshire SMP should have regard for the implications of adapting the shoreline on migratory species.
<i>Cultural, Architectural and Archaeological Heritage</i>				

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972) "The World Heritage Convention" [WHC-2005/WS/02]	<p>Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage and ensure that effective and active measures are taken for these.</p> <p>The Convention recognises the way in which people interact with nature and encourages signatories to</p> <ul style="list-style-type: none"> • integrate the protection of cultural and natural heritage into regional planning programmes, • set up staff and services at their sites, • undertake scientific and technical conservation research and • adopt measures which give this heritage a function in the day-to-day life of the community. 	<ul style="list-style-type: none"> • Establishment of measures for the protection of monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them. Includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities. • World Heritage Sites in Ireland are specific locations that have been included in the UNESCO World Heritage Programme list of sites of outstanding cultural or natural importance to the common heritage of humankind. Two such sites in Ireland have been designated 		<p>The Ayrshire SMP should consider sites of cultural and natural heritage and ensure they are protected from loss or damage resulting from alterations to the Ayrshire shoreline.</p>
<i>Geology, Soils and Landuse</i>				
EU Thematic Strategy for Soil Protection [COM(2006) 231] (including proposals for a Soil Framework Directive)	<p>Highlights a need for action to prevent the ongoing deterioration of Europe's soils.</p> <p>The Soil Thematic Strategy would seek to:</p> <ul style="list-style-type: none"> • Establish common principles for the protection and sustainable use of soils; • Prevent threats to soils, and mitigate the effects of those threats; 	<ul style="list-style-type: none"> • Objective of integrating soil protection into other EU policies, including agriculture and rural. • Promotion of rehabilitation of industrial sites and contaminated land. 		<p>The provisions of the European Strategy should form a framework for soil protection and improvement that the Ayrshire SMP should take into account.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
	<ul style="list-style-type: none"> • Preserve soil functions within the context of sustainable use; and • Restore degraded and contaminated soils to approved levels of functionality. 			
<i>Landscape and Visual Amenity</i>				
European Landscape Convention (ETS No. 176), Florence, 20 October 2000	<ul style="list-style-type: none"> • Promotion of the protection, management and planning of European landscapes and organising European co-operation on landscape issues. • Applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. • Inclusion of landscapes that might be considered outstanding as well as everyday or degraded landscapes. • Aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape. • Complements the Council of Europe's and UNESCO's heritage conventions. 	<ul style="list-style-type: none"> • Respond to the public's wish to enjoy high-quality landscapes and to play an active part in the development of landscapes. • Each administrative level (national, regional and local) should draw up specific and/or sectoral landscape strategies within the limits of its competences. These are based on the resources and institutions which, when co-ordinated in terms of space and time, allow policy implementation to be programmed. The various strategies should be linked by landscape quality objectives. 		Making alterations to the Ayrshire shoreline could potentially have implications on landscapes and visual amenity.
<i>Water</i>				
EU Marine Strategy Framework Directive (2008/56/EC)	<ul style="list-style-type: none"> • Provides a framework to protect the marine environment across Europe. 	<ul style="list-style-type: none"> • To achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social 		The Ayrshire SMP will have regard to this Directive and seek to contribute, wherever possible, towards the achievement of its

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
		activities depend		objectives.
The 'Floods' Directive, 2007 (2007/60/EC)	This Directive provides a framework for the assessment and management of flood risks, aiming to reduce the adverse consequences associated with flooding for human health, the environment, cultural heritage and economic activity.	<p>Member States must:</p> <ul style="list-style-type: none"> • assess the risk of flooding of all water courses and coast lines, • map the flood extent and assets and humans at risk in these areas at River Basin level and in areas covered by Article 5(1) and 13(1); and • implement flood risk management plans and take adequate and coordinated measures to reduce this flood risk. <p>Member States are required to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by the end of 2015. The public must be informed and allowed to participate in the planning process.</p>		The Ayrshire SMP will need to be aware of areas identified as being at risk of flooding and should not contribute to flood risk.
The EU Water Framework Directive (2000/60/EC), (as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC and 2009/31/EC.	<p>Aims to improve water quality and quantity within rivers, estuaries, coasts and aquifers.</p> <p>Aims to prevent the deterioration of aquatic ecosystems and associated wetland by setting out a timetable until 2027 to achieve good ecological status</p>	<ul style="list-style-type: none"> • Identification and establishment of individual river basin districts. • Preparation of individual river basin management plans for each of the catchments. These contain the main issues for the water environment and the actions needed to deal with them. 		The Ayrshire SMP will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
	<p>or potential.</p> <p>Member States are required to manage the effects on the ecological quality of water which result from changes to the physical characteristics of water bodies.</p> <p>Action is required in those cases where these “hydro-morphological” pressures are having an ecological impact which will interfere with the ability to achieve WFD objectives.</p> <p>The following Directives have been subsumed into the Water Framework Directive :</p> <ul style="list-style-type: none"> • The Drinking Water Abstraction Directive • Sampling Drinking Water Directive • Exchange of Information on Quality of Surface Freshwater Directive • Shellfish Directive • Freshwater Fish Directive • Groundwater (Dangerous Substances) Directive • Dangerous Substances Directive 	<ul style="list-style-type: none"> • Establishment of a programme of monitoring water quality in each RBD. • Establishment of a Register of Protected Areas (includes areas previously designated under the Freshwater Fish and Shellfish Directives which have become sites designated for the protection of economically significant aquatic species under WFD and placed on the Protected Areas register). • Promotion of sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimising the effects of flooding and drought events and facilitating long term improvements in water quality, including the protection of groundwater near landfill sites, as well as minimising agricultural runoff. 		
<p>Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the Priority Substances Directive), as amended by Directive 2013/39/EU.</p>	<ul style="list-style-type: none"> • Establishes environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive and aims to achieve good surface water chemical status in accordance with the provisions and objectives of 	<ul style="list-style-type: none"> • Apply the EQS laid down in Part A of Annex I to this Directive for bodies of surface water. • Determine the frequency of monitoring in biota and/or sediment of substances. • Monitoring shall take place at least 		<p>Impacts on water quality are of relevance to the Ayrshire SMP and proposed measures should not result in water pollution.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
	Article 4 of the Water Framework Directive.	<p>once every year, unless technical knowledge and expert judgment justify another interval.</p> <ul style="list-style-type: none"> • Notify the European Commission if the substances for which EQS have been established if a deviation of the monitoring is planned along with the rationale and approach. • Establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for each river basin district. 		
<i>Environment and Sustainable Development</i>				
EIA Directive (2011/92/EU as amended by 2014/52/EU)	<ul style="list-style-type: none"> • Requires the assessment of the environmental effects of public and private projects which are likely to have significant effects on the environment. • Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects. 	<ul style="list-style-type: none"> • All projects listed in Annex I are considered as having significant effects on the environment and compulsorily require an EIA. • For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case by case examination. The competent authority may give a decision on whether a project requires EIA. • Requirement for identification, description and assessment in an appropriate manner, in the light of each individual case, on the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material 		The Ayrshire SMP may need to have regard to the EIA regulations in relation to its proposed measures.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
		<p>assets and the cultural heritage, the interaction between each factor.</p> <ul style="list-style-type: none"> • Requirement for consultation with relevant authorities, stakeholders and public allowing sufficient time to make a submission before a decision is made. • Establishment of a recognised structure and content for the Environmental Impact Statement, which is the document submitted as a written account of the EIA. • Inclusion of proposed flood risk management schemes in EIA screening process 		
SEA Directive (2001/42/EC)	<ul style="list-style-type: none"> • Seeks to integrate environmental considerations into the preparation of plans and programmes as a means of ensuring a high level of protection for the environment whilst also promoting sustainable development. 	<ul style="list-style-type: none"> • Requires an SEA for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive 		The Ayrshire SMP is required to have regard to the SEA regulations.
Environmental Liability Directive (2004/35/EC)	<ul style="list-style-type: none"> • Establishes a framework for environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage. • Relates to environmental damage caused by occupational activities (listed in Annex III), and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected 	<ul style="list-style-type: none"> • Describes procedures for circumstances where environmental damage has occurred. Requires the polluter to take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment 		The Ayrshire SMP may need to have regard to the directive in relation to its proposed measures.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation	Relevance to the Plan
	<p>species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.</p>	<p>of services and the necessary remedial measures.</p> <ul style="list-style-type: none"> • Establishes measures for cases where environmental damage has not yet occurred, but there is an imminent threat of such damage occurring. • The regulations make the polluter financially liable and allow the competent authority to initiate cost recovery proceedings where appropriate. 		

NATIONAL

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
<i>Biodiversity, Flora and Fauna</i>				
The Nature Conservation Act 2004	<ul style="list-style-type: none"> National strategy for the maintenance and enhancement of biological diversity, which should be integrated across other policy sectors. 	<ul style="list-style-type: none"> Requires the government to report on progress with the strategy every three years. 	UN Convention on Biological Diversity (1992) Strategic Plan 2011 to 2020 "Living in Harmony with Nature".	The Ayrshire SMP should look for opportunities to conserve, and where possible restore, biodiversity.
The 2020 Challenge	<ul style="list-style-type: none"> Focuses on the desired outcomes for 2020 and is Scotland's response to the European Biodiversity Strategy for 2020 and the UN 'Aichi' targets. 	<ul style="list-style-type: none"> Shows how the Scottish Government, its public agencies, Scottish business and others can contribute to the Strategy's aims as well as supporting sustainable economic growth. 	European Biodiversity Strategy for 2020. UN 'Aichi' targets.	The Ayrshire SMP should have regard for the strategic aims of this document and seek to, wherever possible, seek to preserve and protect Scotland's biodiversity.
Scotland's Biodiversity: It's in Your Hands	<ul style="list-style-type: none"> Sets out how the government will conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future. 	<ul style="list-style-type: none"> The strategy set out a vision for 2030 as well as objectives and desired outcomes to achieve this. 	UN Convention on Biological Diversity (1992) Strategic Plan 2011 to 2020 "Living in Harmony with Nature". European Biodiversity Strategy for 2020.	The Ayrshire SMP should have regard for the objectives of this strategy and seek to contribute towards its desired outcomes where possible.
The Wildlife and Natural Environment (Scotland) act 2011	<ul style="list-style-type: none"> Modernises existing legislation and extends the regime for controlling non-native and invasive species. 	<ul style="list-style-type: none"> Introduces new regime for regulating invasive and non-native species Makes changes to the licencing system for protected species Makes operational changes to the management of Sites of Special Scientific Interest 	Wildlife and Countryside Act 1981 The Deer (Scotland) Act 1996	The Ayrshire SMP will have regard for this legislation, in particular, taking heed of its regulation regarding protected sites and species.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
The Nature Conservation (Scotland) Act 2004	<ul style="list-style-type: none"> Provides for a greater degree of protection for Scotland's biodiversity and sites of conservation. 	<ul style="list-style-type: none"> Places duties on public bodies in relation to the conservation of biodiversity. Increases protection for Sites of Special Scientific Interest Amends legislation of Nature Conservation Orders Strengthens wildlife enforcement regulations 	Wildlife and Countryside Act 1981	The Ayrshire SMP will be developed so as to comply with this legislation; seeking, where possible, to preserve and protect Scotland's natural environment to the greatest extent possible.
The Habitats Regulations 1994 (and amendments)	<ul style="list-style-type: none"> Implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). 	<ul style="list-style-type: none"> Details and designates for protection, a number of European animal and plant species Introduces designated Special Areas of Conservation 	EU Habitats Directive	The Ayrshire SMP will have regard for the protection afforded to the species and sites designated as a result of this legislation.
<i>Water</i>				
Flood Risk Management (Scotland) Act 2009	<ul style="list-style-type: none"> Transposes the EU Floods Directive into Scots law and brings Scottish flooding legislation up to date. 	<ul style="list-style-type: none"> The EU Floods Directive purpose is to establish a framework for the assessment and management of flood risk. It aims to reduce and mitigate the adverse consequences of flooding on human health, environment, cultural heritage, economic activity 	EU Floods Directive	The Ayrshire SMP will seek to comply with the objectives of this legislation.
Natural Flood Management Handbook 2015	A practical guide to flood risk management measures which work with natural features and processes to manage the sources and pathways of flood waters (natural flood management).	<ul style="list-style-type: none"> To provide guidance in relation to an approach to flood risk management which is more sustainable than traditional methods such as hard defences. To encourage investment into natural flood management measures. 		The objectives and policies of the Ayrshire SMP will seek to support natural coastal processes and deliver projects that include NFM measures.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
National Marine Plan 2015	<ul style="list-style-type: none"> Provides a consistent framework for the continued operation of existing marine regulatory and legislative requirements. It covers the management of both Scottish inshore and offshore waters (12 to 200 nautical miles) and was prepared in accordance with the EU Directive 2014/89/EU. 	<ul style="list-style-type: none"> To ensure that increasing demands for the use of the marine environment are managed, that the economic development of marine industries is encouraged and that environmental protection is incorporated into marine decision making. 	Marine (Scotland) Act	The Ayrshire SMP will have regard for the principles and objectives of the National Marine Plan and will aspire to contribute towards their achievement.
A Guide to Managing Coastal Erosion in Beach/Dune Systems	<ul style="list-style-type: none"> Provides guidance in relation to the options available for managing coastal erosion. 	<ul style="list-style-type: none"> To assist in the practical management of marine erosion along dunes and beaches. 		The Ayrshire SMP will have consideration for this guidance and will seek to adhere to best practice where applicable.
Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)	<ul style="list-style-type: none"> Applies regulatory controls over activities which may affect Scotland's water environment including rivers, lochs, transitional waters (estuaries), coastal waters, groundwater and groundwater dependent wetlands. 	<ul style="list-style-type: none"> Aims to control impacts on the water environment, including mitigating the effects on other water users. 		The Ayrshire SMP will have regard for these regulations and will seek to comply with their objectives to limit adverse impacts upon the water environment.
Water Environment and Water Services (Scotland) Act 2003	<ul style="list-style-type: none"> Transposes the EU Water Framework Directive into Scots law. The Act gives Scottish Ministers powers to introduce regulatory controls over certain activities in order to protect and improve Scotland's water environment. 	<ul style="list-style-type: none"> •Part 1 relates to protection of the water environment and to the implementation of the WFD to protect and improve the water environment, to promote sustainable water use, reduce discharges of priority substances and cease discharges of priority hazardous substances, and to contribute to mitigating the effects of floods and droughts. •Part 2 covers issues relating to the provision of water and sewerage 	EU WFD	The Ayrshire SMP will seek to comply with the objectives of this legislation.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
		services. <ul style="list-style-type: none"> •Part 3 deals with the making of orders and regulations under the Act. 		
The Marine (Scotland) Act 2010	<ul style="list-style-type: none"> • Introduces a duty to protect and enhance the marine environment and includes measures to help boost economic investment and growth in areas such as marine renewables 	<ul style="list-style-type: none"> • Introduces new marine planning system • Minimises the number of licences required for development within the marine environment • Introduced new powers to protect and manage areas of importance for marine life 		The Ayrshire SMP will seek to comply with the objectives of this legislation.
The River Basin Management Plan for the Scotland River Basin 2015 - 2027	<ul style="list-style-type: none"> • Scotland's route map for protecting and improving the water environment of the Scotland river basin district. 	<ul style="list-style-type: none"> • To provide an understanding of the present condition of the Scotland River Basin District. 		The Ayrshire SMP will have consideration for the Plan and will seek to, where possible, protect and enhance the quality of the Scottish River Basin District.
Scottish Planning Policy	<ul style="list-style-type: none"> • A statement of Scottish Government policy on how nationally importance land use planning matters should be addressed across the country. 	<ul style="list-style-type: none"> • Sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. 	Town and Country Planning (Scottish) 1997 Act National Planning Framework for Scotland	The Ayrshire SMP will have regard for the principles of this policy document relating to climate change and flood risk. It will seek to adhere to said principles to the greatest extent possible.
<i>Climatic Factors</i>				
Low Carbon Scotland: Meeting out Emissions	<ul style="list-style-type: none"> • Sets out how Scotland can deliver its statutory annual targets for reduction 	<ul style="list-style-type: none"> • Seeks to achieve the objectives of the Climate Change (Scotland) Act 	Climate Change	The Ayrshire SMP will have regard for national and

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
Reduction Targets 2013 - 2027	in greenhouse gas emissions for the period 2013-2027 set through the Climate Change (Scotland) Act 2009.	2009 and related policies in a manner which is just and sustainable and which promoted good governance and the responsible use of sound science.	(Scotland) Act 2009	international objectives featured and referred to within this document. It will seek to contribute towards the achievements of these objectives; supporting, where possible, the measures which have been developed and set out within this document.
Scotland's Climate Change Adaptation Framework	<ul style="list-style-type: none"> Presents a national, co-ordinated approach to climate change; setting out the risks and opportunities associated with such. It further provides an overarching framework for the Sector Action Plans. 	<ul style="list-style-type: none"> Aims to lead planned adaptation across all sectors to increase the resilience of Scotland's communities, and the natural and economic systems on which they depend, to the impacts of climate change. 	Climate Change (Scotland) Act 2009	The Plan will have regard for the risks and opportunities addressed within this framework. It will seek, where possible, to contribute towards its objectives and those to which it refers.
Climate Change (Scotland) Act 2009	<ul style="list-style-type: none"> Establishes the statutory framework for greenhouse gas emissions reductions in Scotland. 	<ul style="list-style-type: none"> Seeks to reduce GHG emissions in Scotland by 42% by 2020 and 80% by 2050 		The Ayrshire SMP will have regard to this climate change strategy to contribute towards the achievement of the objectives of the regulatory framework.
The Climate Change (Annual Targets) (Scotland) Order 2010	<ul style="list-style-type: none"> Sets the first batch of annual emissions reduction targets, for the period 2010-2022 	<ul style="list-style-type: none"> Sets the first batch of annual emissions reduction targets, for the period 2010-2022 	Climate Change (Scotland) Act 2009	The Ayrshire SMP will have regard to the targets outlined within this order and will remain conscientious of the need to limit the emission of CO ₂ with regard to the measures it proposes.
<i>Geology, Soils and Landuse</i>				

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
The Scottish Soil Framework	<ul style="list-style-type: none"> • Sets out the vision for soil protection in Scotland. 	<ul style="list-style-type: none"> • Seeks to promote the sustainable management and protection of soils consistent with the economic, social and environmental needs of Scotland 	The EU's Seventh Environmental Action Programme	The Ayrshire SMP will have regard for the implications of any proposed measures upon the soils within the Study Area. It will seek, where possible, to minimise any detrimental impact(s) which proposed measures may have upon soil quality.
The Land Reform (Scotland) Bill	<ul style="list-style-type: none"> • Seeks to enhance the relationship between the people of Scotland and the land by way of enhancing Scottish land rights. 	<ul style="list-style-type: none"> • Requires the Scottish Government to publish a statement on land rights and responsibilities every five years. • Established the Scottish Land Commission • Aims to promote better collaboration and engagement between landowners and communities. 		The Ayrshire SMP will respect the land rights of the local community.
Land Use Strategy 2016-2021	<ul style="list-style-type: none"> • A strategic policy framework for land use 	<ul style="list-style-type: none"> • Land-based businesses working with nature to contribute more to Scotland's prosperity • Responsible stewardship of Scotland's natural resources • Urban and rural communities better connected to the land 	Climate Change (Scotland) Act 2009	The Ayrshire SMP will be developed in accordance with the objectives of this framework.
<i>Landscape and Visual Amenity</i>				

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
The Planning etc. (Scotland) Act 2006	<ul style="list-style-type: none"> Establishes the foundations for the National Planning Framework and Expands upon and amends existing planning legislation 	<ul style="list-style-type: none"> Provides for the designation of National Scenic Areas (NSAs) 	Town and Country Planning (Scotland) Act 1997	There are several NSAs within the Study Area. The Ayrshire SMP will have regard to these and will seek to minimise any such negative impacts which might occur as a result of the Ayrshire SMP.
<i>Material Assets and Infrastructure</i>				
The National Planning Framework	<ul style="list-style-type: none"> Sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole 	<ul style="list-style-type: none"> To support economic growth, regeneration and the creation of well-designed places To reduce carbon emissions and adapt to climate change To protect and enhance Scotland's natural cultural assets 	The Town and Country Planning (Scotland) Act 1997 The Planning etc. (Scotland) Act 2006	The Ayrshire SMP will have regard to the Framework and will seek to contribute towards the achievement of its objectives.
Planning Advice Notes and Circulars	<ul style="list-style-type: none"> PANs provide advice in relation to various subjects relating to planning. 	<ul style="list-style-type: none"> To provide guidance in relation to planning and environmental issues/subjects. 	Scottish Planning Policy	The Ayrshire SMP will seek to adhere to the good practice guidelines set out within PANs and circulars.
<i>Population and Human Health</i>				
Equally Well	<ul style="list-style-type: none"> A public health strategy for Scotland with a focus on health inequalities. 	<ul style="list-style-type: none"> Aims to reduce people's exposure to factors in the physical and social environment that cause stress, damage health and wellbeing and lead to inequalities. 		The Ayrshire SMP will have regard for the health of the population; both locally and on a regional scale. It will seek, wherever possible, to improve the health of the population and reduce any associated

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to the Strategy
				inequalities.
Good Places, Better Health: A New Approach to Environment and Health in Scotland	<ul style="list-style-type: none"> The Scottish Government's strategy on health and the environment. 	<ul style="list-style-type: none"> Aims to create environments free from significant hazards and to create positive physical environments which nurture better health and wellbeing. 	Equally Well	The Ayrshire SMP recognises the need to create safe and positive environments for health. It will endeavour to provide for such environments wherever possible.
<i>Cultural, Architectural & Archaeological Heritage</i>				
Out Place in Time: The historic environment strategy for Scotland	Overarching strategy for the protection and promotion of the historic environment in Scotland.	<ul style="list-style-type: none"> To provide ambition and direction for Scotland's historic environment 		The Ayrshire SMP will seek to provide for the conservation of relevant historic environment assets and areas of cultural significance.
Historic Environment Scotland Policy Statement (June 2016)	Sets out how Historic Environment Scotland fulfils its regulatory and advisory roles and how it expects others to interpret and implement Scottish Planning and Policy.	<ul style="list-style-type: none"> Highlights the necessity, and approach, of HES in relation to the preservation of Scotland's historic environment. Identifies principles of conservation of Scotland's historic environment Emphasises the approach to be taken by relevant bodies with responsibilities for any aspect of the historic environment. 		The Ayrshire SMP will seek to provide for the conservation of relevant historic environment assets and areas of cultural significance in line with the advice given as part of this statement.

REGIONAL/SUB-REGIONAL

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Strategy
North Ayrshire Council Local Development Plan	<ul style="list-style-type: none"> • Statutory document which provides detailed planning policies to ensure proper planning and sustainable development of area. • Sets out objectives for future planning and development. 	<ul style="list-style-type: none"> • Identifies issues of relevance to the area and outlines principles for future development of area. • Is consistent with relevant Development Plans, Spatial Strategies and Planning Guidelines 	The Ayrshire SMP will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
South Ayrshire Proposed Local Development Plan	<ul style="list-style-type: none"> • Statutory document which provides detailed planning policies to ensure proper planning and sustainable development of area. • Sets out objectives for future planning and development. 	<ul style="list-style-type: none"> • Identifies issues of relevance to the area and outlines principles for future development of area. • Is consistent with relevant Development Plans, Spatial Strategies and Planning Guidelines 	The Ayrshire SMP will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Draft Local Biodiversity Action Plan for North Ayrshire 2014-2017	<ul style="list-style-type: none"> • Aims to protect, conserve, enhance and restore biodiversity and ecosystem services across all spectrums. 	<ul style="list-style-type: none"> • Outlines the status of biodiversity and identifies species of importance. • Outlines objectives and targets to be met to maintain and improve biodiversity. • Aims increase awareness. 	The Ayrshire SMP will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Ayrshire Biodiversity Action Plan: The Conservation and Enhancement of Ayrshire's Biodiversity.	<ul style="list-style-type: none"> • Aims to protect, conserve, enhance and restore biodiversity and ecosystem services across all spectrums. 	<ul style="list-style-type: none"> • Outlines the status of biodiversity and identifies species of importance. • Outlines objectives and targets to be met to maintain and improve biodiversity. • Aims increase awareness. 	The Ayrshire SMP will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Conservation Area Management Plan: Ayr Central.	<ul style="list-style-type: none"> • Aims to highlight the importance of heritage at a strategic level. 	<ul style="list-style-type: none"> • Manage and promote heritage as well as increase awareness. • Aim to conserve and protect heritage. 	The Ayrshire SMP will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

APPENDIX E

SEA SCORING GUIDELINES

Topic	Objective	Score	Score Description	Example Of Impacts
Biodiversity, Flora And Fauna	Avoid damage to, and where possible enhance, the biodiversity, flora and fauna in the vicinity of the shoreline.	3	Significant Positive Impacts	Potential for enhancement of, or increased protection for, European or national sites and species, in line with conservation objectives.
		2	Moderate Positive Impacts	Potential for enhancement of, or increased protection for, locally protected sites and species, in line with conservation objectives.
		1	Slight Positive Impacts	Potential increased public awareness of European, national or locally protected sites and species. Habitat and species information can be made available along the Ayrshire shoreline.
		0	Neutral / No Impacts	No impacts on protected European, national or local sites or species.
		-1	Slight Negative Impacts	Potential for short term disturbance or minor damage to locally protected sites and / or species, or other know species of conservation concern.
		-2	Moderate Negative Impacts	Potential for short term disturbance or minor damage to European or nationally protected sites and / or species.
		-3	Significant Negative Impacts	Potential for permanent damage or reoccurring disturbance to European or nationally protected sites or species.
Population and Human Health	Protect the public from risk of flooding and coastal erosion.	3	Significant Positive Impacts	No population at risk of flooding or erosion.
		2	Moderate Positive Impacts	Significant reduction in the proportion of the population at risk of flooding.

Topic	Objective	Score	Score Description	Example Of Impacts
		1	Slight Positive Impacts	Slight reduction in the proportion of the population at risk of flooding or erosion.
		0	Neutral / No Impacts	No change in the proportion of the population at risk of flooding or erosion
		-1	Slight Negative Impacts	Slight increase in the proportion of the population at risk of flooding or erosion. Temporary disturbance and nuisance to the local population.
		-2	Moderate Negative Impacts	Moderate increase in the proportion of the population at risk of flooding or erosion. Temporary disturbance and nuisance to the regional population.
		-3	Significant Negative Impacts	Significant increase in the proportion of the population at risk of flooding or erosion. Permanent disturbance and nuisance to the local or regional population.
Geology, soils and landuse	Maintain or improve areas of existing functional soil and land resource.	3	Significant Positive Impacts	Gain of new soil or land resource that is protected from coastal flooding or erosion.
		2	Moderate Positive Impacts	No loss of soil or land resource from coastal flooding or erosion.
		1	Slight Positive Impacts	Reduced area of soil or land resource at risk from coastal flooding or erosion.
		0	Neutral / No Impacts	No change in areas of existing functional soil and land resource.

Topic	Objective	Score	Score Description	Example Of Impacts
		-1	Slight Negative Impacts	Natural loss of soil or land resource from coastal flooding or erosion, however not impacting on natural coastal processes.
		-2	Moderate Negative Impacts	Increased loss of soil or land resource from coastal flooding or erosion, however not impacting on natural coastal processes.
		-3	Significant Negative Impacts	Increased loss of soil or land resource from coastal flooding or erosion, while impacting on natural coastal processes.
Water	Protect and enhance the state of the water environment.	3	Significant Positive Impacts	Potential improvement of coastal / transitional waterbody overall status.
		2	Moderate Positive Impacts	Potential for regional improvement of coastal / transitional water quality or removal of man-made structures for natural coastal morphology. Decreased potential impediment to the achievement of waterbody objectives under the WFD.
		1	Slight Positive Impacts	Potential for localised improvement of coastal / transitional water quality.
		0	Neutral / No Impacts	No impacts on status of coastal and transitional waterbodies or local water quality.
		-1	Slight Negative Impacts	Potential for short term or infrequent negative impacts on coastal / transitional water quality.
		-2	Moderate Negative Impacts	Potential for permanent or frequent negative impacts on coastal / transitional water quality or impacts on waterbody morphology with increased man-made structures. Increased potential impediment to the achievement of waterbody objectives under the WFD.

Topic	Objective	Score	Score Description	Example Of Impacts
		-3	Significant Negative Impacts	Potential deterioration of coastal / transitional waterbody overall status.
Climatic factors	Adaptation to potential climatic change.	3	Significant Positive Impacts	SMP policies to be planned for climatic change e.g. increased flood risk and erosion. Enhanced natural GHG sequestering natural cover.
		2	Moderated Positive Impacts	SMP policies adaptable to climatic change e.g. increased flood risk and erosion. No/minimal loss of natural GHG sequestering natural cover.
		1	Slight Positive Impacts	Enhanced natural GHG sequestering natural cover.
		0	Neutral / No Impacts	Maintenance of the existing shoreline management, with no new policies that are adaptable to climatic change. No change in GHG sequestering natural cover.
		-1	Slight Negative Impacts	Short term loss of GHG sequestering natural cover.
		-2	Moderate Negative Impacts	SMP policies not adaptable to climatic change. Permanent loss of GHG sequestering natural cover.
		-3	Significant Negative Impacts	No SMP policy.
Material assets & infrastructure	Protect material assets and infrastructure	3	Significant Positive Impacts	No material assets or infrastructure at risk of flooding and erosion.

Topic	Objective	Score	Score Description	Example Of Impacts
	from risk of flooding and coastal erosion.	2	Moderate Positive Impacts	Significant reduction in the number of material assets or infrastructure at risk of flooding and erosion.
		1	Slight Positive Impacts	Slight reduction in the number of material assets or infrastructure at risk of flooding and erosion.
		0	Neutral / No Impacts	No increase in material assets or infrastructure at risk of flooding and erosion.
		-1	Slight Negative Impacts	Slight increase in the risk of flooding to material assets or infrastructure.
		-2	Moderate Negative Impacts	Moderate increase in the risk of flooding to material assets or infrastructure.
		-3	Significant Negative Impacts	Significant increase in the risk of flooding to material assets or infrastructure.
Cultural, architectural & archaeological heritage	Protect or enhance historic environment features and their settings.	3	Significant Positive Impacts	Potential for protection / preservation of international or nationally designated heritage features.
		2	Moderate Positive Impacts	Potential for improvement on the setting of international or nationally designated heritage features, or potential for protection / preservation of locally designated heritage features.
		1	Slight Positive Impacts	Potential for improvement on the setting of locally designated heritage features.

Topic	Objective	Score	Score Description	Example Of Impacts
		0	Neutral / No Impacts	No loss or damage to heritage features from construction and operation of potential proposed measures.
		-1	Slight Negative Impacts	Potential for impacts on the setting of locally designated heritage features.
		-2	Moderate Negative Impacts	Potential for impacts on the setting of international or nationally designated heritage features, or potential for loss of or damage to locally designated heritage features.
		-3	Significant Negative Impacts	Potential for the loss of or damage to international or nationally designated heritage features.
Landscape & visual amenity	Protect, and where possible enhance the landscape character and visual amenity of the Ayrshire shoreline.	3	Significant Positive Impacts	Permanent enhancement of designated landscapes and views, the landscape / seascape and visual amenity of the Ayrshire shoreline. Many receptors.
		2	Moderate Positive Impacts	Potential localised improvement of landscape / seascape and visual amenity. Several receptors.
		1	Slight Positive Impacts	Potential improvement of local views. Few receptors.
		0	Neutral / No Impacts	No impacts on the landscape / seascape quality and visual amenity.
		-1	Slight Negative Impacts	Short term / disturbance impacts on local views and the local landscape / seascape. Few receptors.

Topic	Objective	Score	Score Description	Example Of Impacts
		-2	Moderate Negative Impacts	Potential localised negative impacts on and deterioration of the landscape / seascape and visual amenity. Several receptors.
		-3	Significant Negative Impacts	Permanent negative impacts on and deterioration of designated landscapes and views, the landscape / seascape quality and visual amenity of the Ayrshire shoreline. Many receptors.