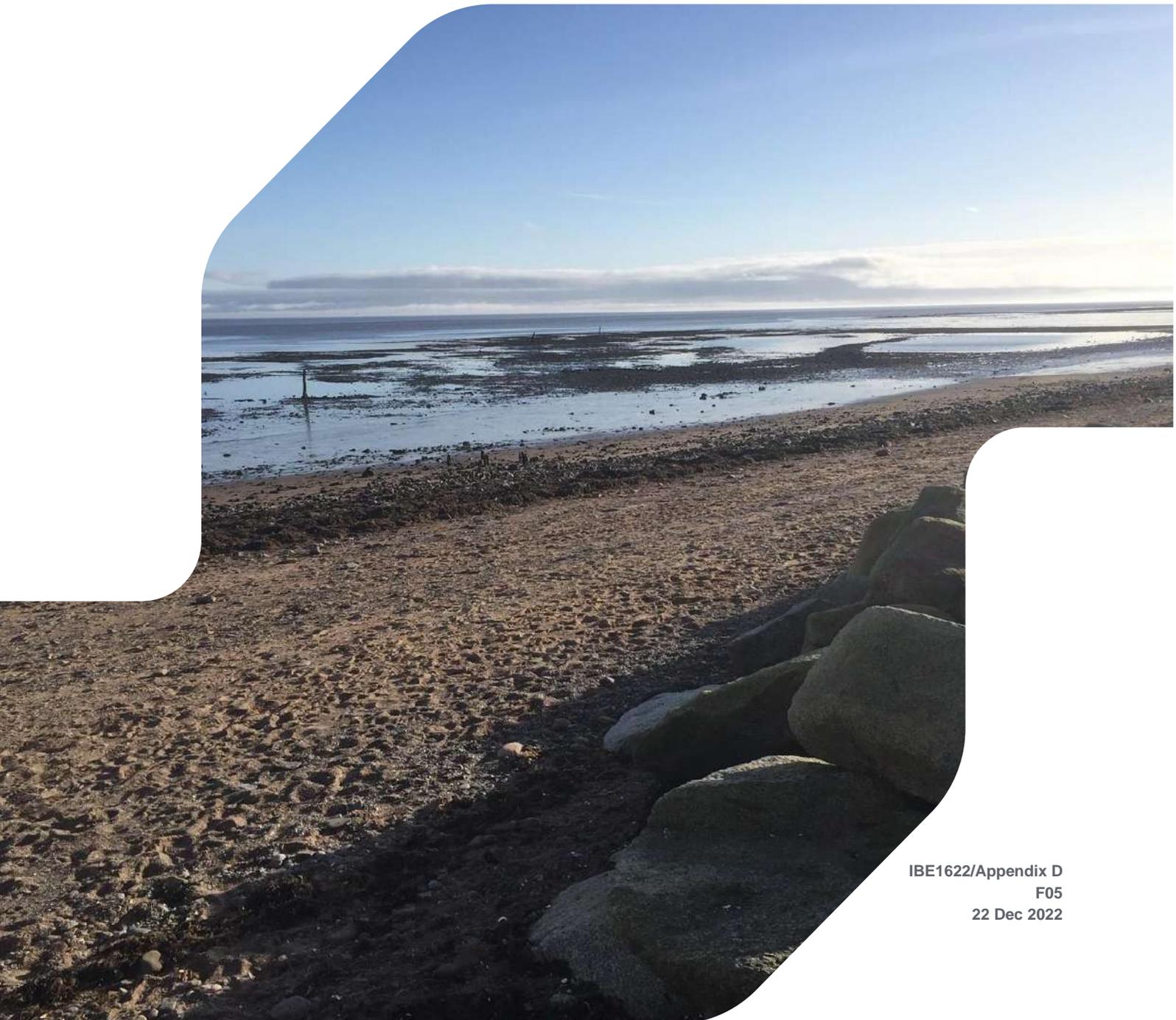


# DUMFRIES & GALLOWAY SHORELINE MANAGEMENT PLAN

## Appendix D – Policy Statements



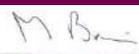
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## APPENDIX D – POLICY STATEMENTS

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### Approval for issue

Malcolm Brian



22 December 2022

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# 1 INTRODUCTION

Policies for the future management of coastal flood and erosion risk along the Dumfries & Galloway coastline have been identified for three epochs, short term (0 – 20 years), medium term (20 – 50 years), and long term (50 – 100 years). For the purposes of defining appropriate management policies the Dumfries & Galloway coastline has been divided into 35 sections or Policy Units (PU) and this document presents a summary of the final preferred management policies as decided following consideration of feedback received from the virtual stakeholder engagement in March / April 2021 and review by the project team.

## D1.1 Preferred Policy Statements

Each Policy Statement adopts the same layout, presenting information on the following;

**Location reference:** This is the general name used to reference each policy unit and a number identifier which is sequential along the shoreline from east to west and clockwise around the shoreline of Dumfries & Galloway. A description of each policy unit is presented, detailing the extent, coastal sediment composition, the name of main settlement(s) and referencing any environmentally designated site(s).

**Flood and Erosion Risk:** Coastal Flood and Erosion risk relating to each policy unit is described and summarised. Flood receptors including residential and non-residential properties, utilities, community facilities, cultural heritage, transport infrastructure and farmland identified to be at a medium likelihood coastal flood risk (1:200 year) by National Flood Risk Assessment (NFRA) are outlined. This information provides a quantified summary of the identified coastal flood risk. The National Coastal Change Assessment (NCCA) information has been used to outline the erosion risk associated with each policy unit. These are the key policy drivers, with the spatial distribution shown on a map.

**Existing Coastal Defences:** This section provides a summary of existing coastal defences and their condition as identified by a Defence Assessment undertaken during 2019. The presumed owner, a brief description, condition grade (1 to 5), maintenance recommendations and a brief description of the benefitting area are provided for each policy unit. Not all sections of this coastline are protected by coastal defence.

**Review of Management policies:** This section outlines the policy screening matrix for assessing each shoreline management policy approach. Each policy was screened to identify potential technical issues, if a potential policy was technically unviable or difficult to justify economically, then another policy was considered. Furthermore, potential environmental and social issues associated with each viable policy were considered. By following this process, the most sustainable approach is identified for progression.

**Justification for Retention / Rejection:** This section provides further detail regarding the justification for retention or rejection of each SMP policy. In this section, additional information that has informed or influenced the policy decision making process is presented. The previous SMP05 policy is also reviewed considering all available and up to date information. In some Policy Units the information presented by existing detailed Flood Risk Studies is also considered. Some of the Policy Statements provide information on other actions that help towards adaptation to coastal erosion and flood risk management, including community resilience building, flood-resistant building and planning for climate change. It should be noted that these actions will be required in most areas, no matter what the preferred policy option outcome is.

**Selection of Policy:** A summary of the Preferred Policies is presented, in some instances a preferred and alternative policy or policies are presented due to uncertainties with the viability of the initial preferred policy or a need for further, more detailed investigations to confirm the suitability of a policy. Sometimes a combination of policies was selected, or the preferred policy changed with time.

**Summary of the preferred Policy recommendation and justification:** This section sets out the general way the shoreline in each Policy unit should be managed during the short term (0-20 years), medium term (20-50 years) and the long term (50-100 years). It does not say exactly how these policies should be implemented. An illustration showing the geographical extent of each Preferred Policy over all epochs is provided. It should be noted that the spatial extent of alternative policies is not presented.

## 2 COASTAL PROCESS UNIT 1

Coastal Process Unit (CPU) 1 of the SMP, the dynamic inner section of the Solway Firth, extends from Gretna in the east to Southernness Point in the west, including the tidal reaches of the Rivers Sark, Annan and Nith. There are seven policy units within CPU 1 for which the relevant management policies are identified in the following sub-sections.

D2.1 PU 1 – Gretna to Browhouses

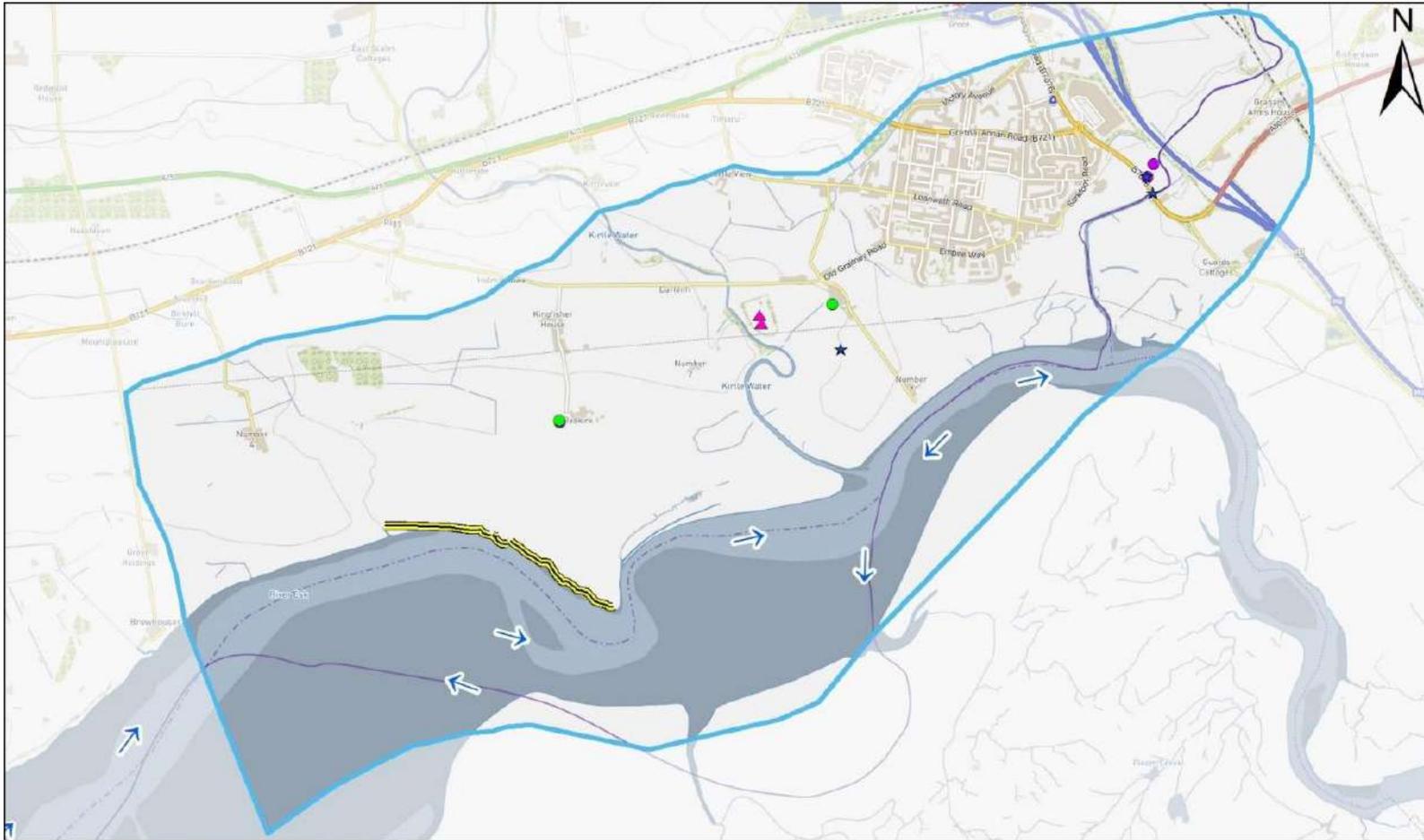


Figure 1.1 Policy Unit 1 Coastal Flood and Erosion Risk

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**DESCRIPTION OF POLICY UNIT**

PU 1 extends from the downstream face of the B7076 road bridge crossing of the River Sark (NY337661) to Browhouses (NY284650), located to the west of Redkirk Point. PU 1 includes approximately 6.2km of shoreline within CPU 1, the dynamic inner section of the Solway Firth.

The shoreline is mainly composed of soft (erodible) material, with an area of saltmarsh located between the mouth of the River Sark and Redkirk Point. At low tide extensive areas of intertidal sands are exposed, with the channel of the River Esk incised through these sands. The Kirtle Water also flows into the Solway Firth within this policy unit, this river and the River Sark are both tidally influenced.

There are environmentally designated areas within PU 1. The entirety of the coastline within this Policy unit is within the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC.

The River Sark forms the border with England and the eastern boundary of the SMP area. The recently updated adjoining SMP for the Cumbrian coast, proposes a policy of Managed Realignment in the short to medium term and Hold the Line in the longer term for area 11e8.10 (Metal Bridge (Esk) to the River Sark) the adjoining section of coast.

Gretna, the main settlement within PU 1 is located on an area of higher ground. There are also several isolated hamlets and large farms located within PU 1. SEPA have defined Gretna as an Objective Target Area. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. It also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, there are two homes and three business premises currently at a medium likelihood coastal flood risk. This is likely to increase to five homes and five business premises affected by 2080 due to climate change.

In addition, approximately 1.39km of roads are currently estimated to be at risk of medium likelihood coastal flood risk, increasing to 1.82km of road due to the anticipated impact of climate change. These include sections of B7076, minor roads, local streets and private roads with restricted access that are identified to be at coastal flood risk.

144 hectares of agricultural land is at risk of medium likelihood coastal flooding as the hinterland is very flat and low lying. Approximately 56% of the affected area is Improved Grassland. Due to climate change this will increase to 171 hectares. The annual average damage associated with coastal flooding is £73,693.

There are three cultural heritage features at medium likelihood flood risk, including two Listed Buildings and one Battlefield. The listed buildings include the Old Toll House and Scotland's first house (NY326670) located to the east of Gretna and Sark Bridge. The Battle of Sark battlefield site is located to the south of Gretna, towards Redkirk and is currently agricultural land.

There are two utility receptors at flood risk, these are located within a Scottish Water facility located to the south-west of Gretna. With climate change an additional Scottish Water facility located to the south-east of Gretna will be affected.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	2	5
Business Premises	3	5
Utilities	2	3
Community facilities	0	0
Cultural Heritage	3	3
Transport roads (km)	1.39	1.82
Transport rail (km)	0	0
Agricultural Land (ha)	144	171

### Summary of Coastal Flood Risk - PU 1

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information  
 \*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

However, it should be noted that due to uncertainties with how salt marsh will react to rising sea levels no coastal change information is presented by Dynamic Coast for areas fronted by saltmarsh. Hence given the presence of salt marsh habitat within PU 1, the indication of no significant erosion risk within this policy unit by the Dynamic Coast data may not be accurate.

Refer to <https://www.dynamiccoast.com> for further details relating to this project.

Other data sources indicate that within PU 1, heritage and historical assets located near to active coastal erosion include the Sark battlefield site.

### EXISTING COASTAL DEFENCES

There are no formal coastal flood defences associated with PU 1. However, there are sections of earthen embankment, principally along the River Sark. These privately constructed defences offer some protection to a business and a caravan site located here, particularly during extreme tidal levels. There is also a section of rock revetment located along the coastal edge of Redkirk Point that extends west for about 1km. The Redkirk coastal defences protect the coastal edge of several agricultural fields as well as providing some protection to Redkirk Geological Conservation Review site and are understood to be private defences.

The maintenance of these defences is the responsibility of the landowners and businesses that benefit from the presence of these structures.

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x			Not likely to be economically viable to Hold the Line in this policy unit.
Managed Realignment	✓	✓	✓	?	No significant issues anticipated. However localised flood defence works, or resilience measures will be required.
No Active Intervention	✓	✓	✓	?	No significant issues anticipated. However localised flood defence works, or resilience measures will be required.

x - Reject  
 ✓ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

### JUSTIFICATION FOR RETENTION / REJECTION

The SMP05 recommended a mixture of No Active Intervention and Hold the Line, with the former applicable to coastal areas where flooding does not pose any risk, whilst the latter applied elsewhere. Over the medium and longer term, a Hold the Line policy was preferred, should the flood frequency increase significantly.

The policy of No Active Intervention can generally be progressed for PU 1. There are no formal coastal defences present along this section of shoreline and erosion risk is limited to agricultural land located to the west of Redkirk Point. This policy would allow natural processes to continue, and avoid any potential issues associated with the construction of new defences along the immediate shoreline affecting the natural processes elsewhere within the Inner Solway Firth by altering sediment distribution and flows. This is particularly important since there are areas of important saltmarsh habitat located here.

There are some properties at flood risk, however the indicated level of risk would not provide an economic case for building significant new defences along the existing shoreline. Therefore, the adoption of a Managed Realignment adaptation approach should be progressed in localised areas where properties are at risk.

Managed Realignment will allow continued natural coastal evolution to occur whilst also allowing measures to be proactively adapted to future coastal changes and environmental opportunities.

This policy has potential to lead to social impacts relating to the loss of properties. There may be potential to improve the flood resilience of properties at risk of flooding by relocation beyond the predicted present day and future flood extents, or by creating localised property protection measures set back from the shoreline. However, these would be unlikely to attract public funding.

These policies, No Active Intervention or Managed Realignment are unlikely to impact on the nearby international and national designated environmental sites, the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC.

## APPENDIX D – POLICY STATEMENTS

The current policy for the adjacent Cumbria Shoreline Management Unit, 11e8.10, is Managed Realignment, which is in line with the national and international environmental designations for this particular site and the policy combination indicated above.

Of the strategic policies available for PU 1, it is recommended that a combination of No Active Intervention and Managed Realignment is progressed. No Active Intervention applies to the majority of PU 1, however Managed Realignment should be applied in the area of the properties at flood risk to the east of Gretna and near the mouth of the River Sark.

### SELECTION OF PREFERRED POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	x	x
Managed Realignment	A*	C*	C*
No Active Intervention	C	C	C

x - Reject

C - Consider

A – Alternative

\* Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 1 is to implement a general SMP policy of No Active Intervention, since there are no formal defences, and no assets are affected by erosion. However, the maintenance of private defences should be permitted subject to consent.

'No Active Intervention', will allow the continuation of natural processes and does not affect sediment distribution and flows within the Solway Firth. This is particularly important since there are areas of intertidal habitat, including saltmarsh present. Adaptation and resilience measures should be encouraged where assets are at risk.

While coastal flooding is expected to increase, in the short term limited economic and social impact may be avoided through resistance / resilience measures. SEPA strategic flood mapping data indicates that coastal flooding depths could exceed 0.3m (1ft) at some properties located within PU 1, during a future medium probability event. Thus, the applicability of water exclusion approaches may depend on the character of the affected property (for masonry type buildings where flood depth is <0.31m and for flood depths <0.59m for other construction types). Properties that are Listed Buildings, may require consent and consultation with Historic Environment Scotland is recommended.

A complementary localised policy of Hold the Line / Managed Realignment is suggested for the short term since there are a small number of homes, business premises, utilities and roads at flood risk. Over the medium to long term an alternative policy of Managed Realignment adaptation approaches should be progressed in localised areas where a flood risk is identified. There may be the potential to improve the flood resilience of flood risk property by relocation, beyond the predicted present day and future flood extents, or by creating localised property protection measures set back from the shoreline. Over the long term the implementation of this policy will reduce potential economic and social impacts associated with coastal flooding.

## APPENDIX D – POLICY STATEMENTS

Managed Realignment is a sustainable alternative policy allowing natural coastal evolution to occur, whilst encouraging the proactive adaptation to future coastal changes, and allowing environmental opportunities to be explored. The implementation of this alternative policy is subject to availability of funding and resources.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 1 and across all epochs, with the complementary Hold the Line and Managed Realignment policies only applied to the areas indicated on Figure 1.2. This will allow areas of intertidal habitat including saltmarsh to function naturally.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, feedback relating to the 'Preferred Option' was obtained. Historic Environment Scotland (HES) and NatureScot who provided specific comments as follows;

NatureScot suggested that Managed Realignment should be considered instead of No Active Intervention at Redkirk, where circa 1km of rock revetment protects the coastal edge. These defences currently protect both the agricultural land and geological deposits that are part of the Geological Conservation Review (GCR) site that contains geological and geomorphological features of national and international importance. Redkirk Point contains a sequence of nationally important sediments that date back to the Holocene and a period of rapid sea-level rise. NatureScot have advised that the removal or failure of the coastal defence at Redkirk Point could adversely affect this area of geological importance. They advised that a 'limited maintenance' approach rather than the abandonment or extension and improvement of these defences is less likely to adversely affect these deposits and therefore they did not support the 'Preferred Policy' of 'No Active Intervention'.

HES noted that the boundary of the Sark Battlefield was not fully reflected by the symbology used in Figure 1.1. This site is subject to medium likelihood flood risk and the seaward edge is at risk of erosion. It is noted that aspects of the historic environment that require protection or mitigation will receive more detailed attention as part of the Strategic Environmental Assessment that accompanies the SMP.

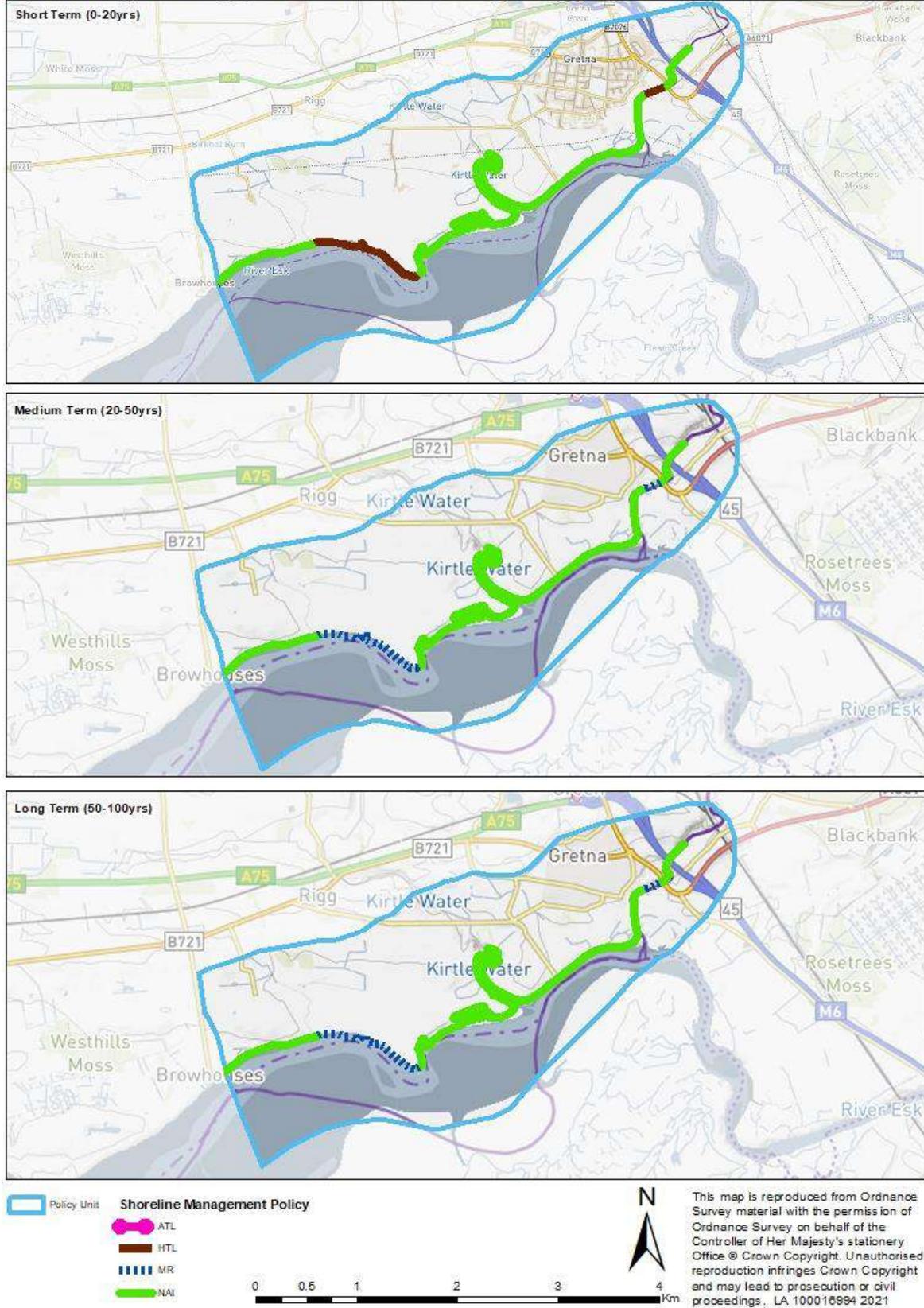
The additional coastal defence at Redkirk was subsequently added to the coastal defence register, however no information on its present state or condition was available.

### STAKEHOLDER ENGAGEMENT OUTCOME

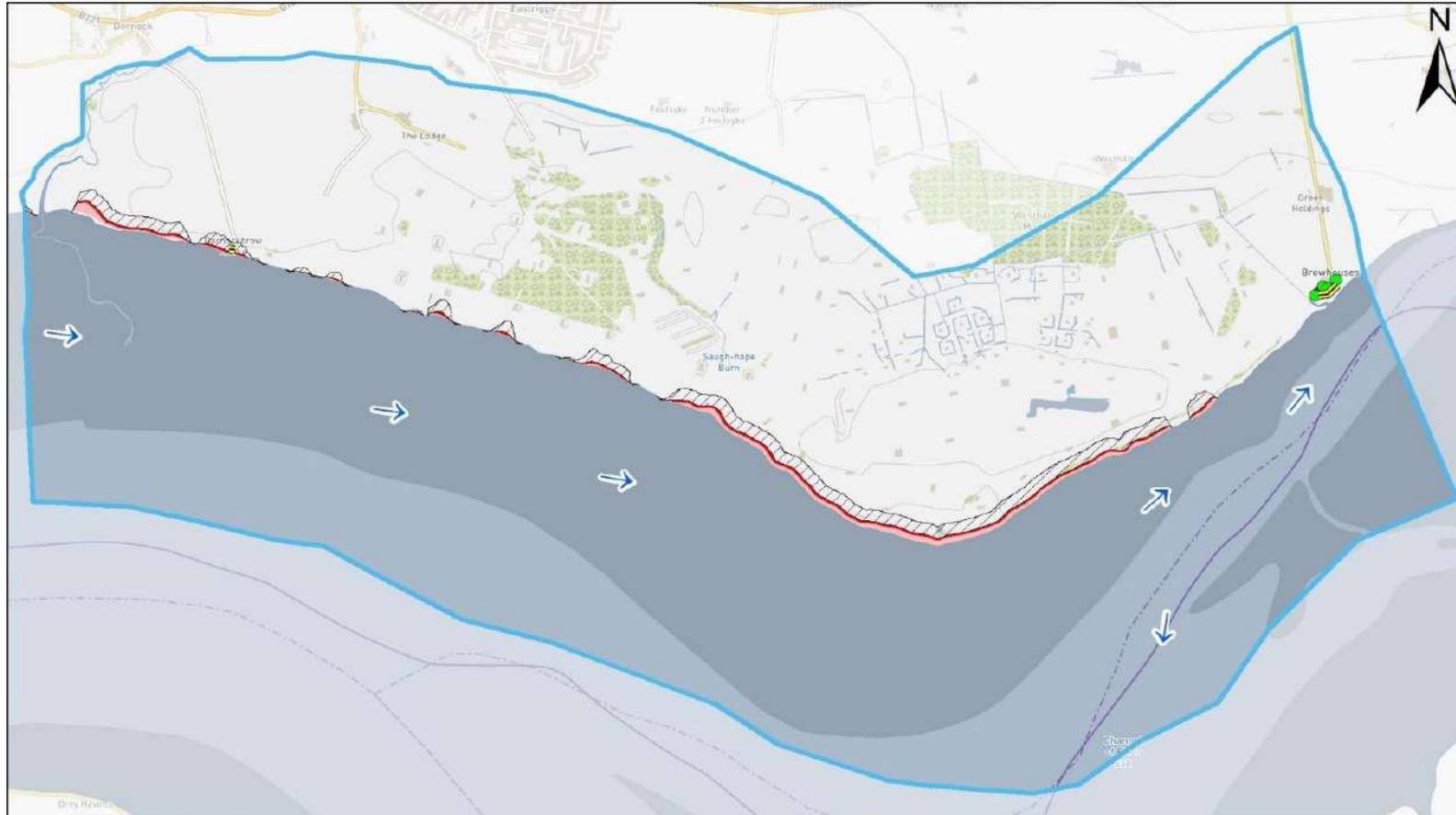
The 'Preferred Policy' remains one of generally No Active Intervention, as it facilitates the continuation of natural processes and sediment distribution and flows within the Solway Firth, without any risk of disruption that may be posed by the construction of coastal defences. This is particularly important since there are extensive areas of intertidal habitat, including saltmarsh. However, the management policy should accommodate the 'limited maintenance' of existing private defences, subject to consent. Extension or improvement of these coastal defences is not recommended, as this may lead to localised beach steepening and the loss of salt marsh habitat. A Preferred Policy of No Active Intervention with limited Hold the Line or Managed Realignment was consequently taken forward to the 'Action Plan' stage. Figure 1.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 1.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 1.2 Policy Unit 1 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D2.2 PU 2 – Browhouses to Dornock Burn



**Figure 2.1 Policy Unit 2 Coastal Flood and Erosion Risk**

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**DESCRIPTION OF POLICY UNIT**

PU 2 extends westwards from east of Browhouses (NY284650) past Torduff Point to the mouth of the Dornock Burn in the west (NY227653). PU 2 includes approximately 6.1km of shoreline within CPU 1, the dynamic inner section of the Solway Firth.

The shoreline is mainly composed of soft (erodible) material, with areas of saltmarsh located at Browhouses, Torduff Point and Dornock. At low tide an extensive area of intertidal sands are exposed, with the channel of the River Esk incised through these sands. There are several small streams that drain the hinterland, including the Dornock Burn which is tidally influenced.

Browhouses is the main settlement located adjacent to the shoreline, Gardrum is located a short distance landwards. The hinterland is relatively level and low lying and is dominated by the Easttriggs MoD site. There are environmentally designated sites within PU 2, with the entirety of the coastline within this Policy unit located within the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC.

**FLOOD RISK**

Based on the SEPA strategic flood mapping data, there are five homes and three business premises currently at a medium likelihood coastal flood risk. This is likely to increase to eight homes and six business premises by 2080 due to climate change.

In addition about 0.68km of road is presently shown to be at risk, this is mainly minor and private roads. It is estimated that the length of road at medium likelihood flood risk will increase to 0.85km in the future due to climate change.

58 hectares of agricultural land is at risk of medium likelihood coastal flooding of which approximately 46% is land used for Rough Grazing. Due to climate change this will increase to 129 hectares as the hinterland is flat. The annual average damage associated with coastal flooding is £47,883.

There are no utilities presently at flood risk but two utilities at future coastal flood risk, these are Scottish Water facilities located close to Dornock Brow and to the west of Dornock Point.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	5	8
Business Premises	3	6
Utilities	0	2
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	0.68	0.85
Transport rail (km)	0	0
Agricultural Land (ha)	58	129

**Summary of Coastal Flood Risk in PU 2**

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information \*Climate change projections are based on UKCP09 projections.

**EROSION RISK**

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

The Dynamic Coast outputs indicate an area of coastal erosion risk around Torduff Point. The MoD Eastriggs site is located landward of this section of the shoreline and was formerly associated with wartime Cordite manufacturing, thus there is a risk that the site may be contaminated, and that erosion may release potential contaminants into the marine environment.

PU 2 represents a dynamic shoreline with areas of erosion. Dynamic Coast estimates that by 2030 the shoreline of PU 2 will have advanced seawards by up to 6m at some locations, whilst receding landwards by up to 17m along other sections of this shoreline. By 2050, erosion will have increased to the point that the entire shoreline is anticipated to be eroding.

A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 2 is tabulated below.

By 2050, there will be two homes located within the Erosion Vicinity as well as 0.22km of access road, and about 0.5km of the Scottish Water clean water network.

By 2100, it is anticipated that three homes and 0.48km of access road will be located within the Erosion Vicinity while 4.3km of the Scottish Water clean water network will be at erosion risk.

Assets within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	2	0	0	0	0	0	0.22
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	3	0	0	6	0	0	0.48

**Summary of Coastal Erosion Risk in PU 2**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWs position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWs in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

**APPENDIX D – POLICY STATEMENTS**

**EXISTING COASTAL DEFENCE**

There is one section of formal coastal defences associated with PU 2, located along the shoreline at Browhouses. The 2002 Coastal Protection Inventory referred to this defence as the Browhouses Seawall and stated it was privately owned.

**SUMMARY OF EXISTING COASTAL DEFENCE**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Browhouses (Bhouse001)	Private	Wall	3	Monitor and repair as required.	Private property and private access road
Dornockbrow	Private	Wall	-	-	-

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor

**Browhouses (Bhouse001)**

This is a series of continuous defence assets that fringe the shoreline at Browhouses (NY281649). This defence is described as a masonry wall located along the foreshore for about 1km. The presence of this defence benefits a private access road and residential properties. The wall defines the landward extent of saltmarsh habitat. These defences are in fair condition. The continued management of this defence is recommended, including the replacement of stone caps on the wall crest, the cutting back of vegetation and continued monitoring. An assessment of the visible slumping of the wall is recommended. The 2002 Coastal Protection Inventory referred to this defence as Browhouses Sea Wall and they are privately owned.



**Plate 2.1: Bhouse001 – Wall**

**APPENDIX D – POLICY STATEMENTS**

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✓	!	✓	Progress Hold the Line, there are significant Environment & Heritage impacts anticipated.
Managed Realignment	✓	✓	!	?	Progress Managed Realignment, there are significant Environment & Heritage impacts anticipated.
No Active Intervention	x				No Active Intervention, there are unknown risks associated with potential contamination at Eastriggs therefore management is required.
<p>x - Reject</p> <p>✓ - Progress</p> <p>? - Progress, however potential for impacts identified</p> <p>! - Progress, however potential for significant impacts identified</p>					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>The SMP05 policy for the flood risk properties located at Browhouses was Hold the Line, while No Active Intervention applied to the remaining frontage.</p> <p>Eastriggs was formerly associated with Cordite manufacturing and is a low lying site subject to potential future erosion risk and hence represents a potential contamination risk. Initially in the absence of any knowledge of the contamination status of this site and therefore the potential future risk of buried contaminants being released to the marine environment a policy of Hold the Line was suggested for the short term. This would potentially benefit Scottish Water Infrastructure, but on the other hand, the installation of additional defences may impact on the internationally designated habitats within the Upper Solway Flats and Marshes SPA and Ramsar and the Solway Firth SAC, potentially requiring compensatory habitat creation elsewhere. The SMP05 mentioned that an examination of the MOD frontage at Eastriggs noted the presence of ruined defences (low sloping revetment) around Torduff Point. Considering that relict defences already exist, it was speculated that the construction of new defences was unlikely to significantly impact the existing environment.</p> <p>However, Managed Realignment could potentially be adopted if the lands nearest the sea are not contaminated as this would allow erosion to continue until the risk of contaminated land being encountered justifies the establishment of a new defence line. However for the draft SMP Managed Realignment was not recommended due to the lack of knowledge of the potential contamination status of the lands at Eastriggs. It was also noted that a policy of Managed Realignment might require the realignment of Scottish Water assets, hence further assessment and liaison with Scottish Water was suggested if this was to be progressed.</p> <p>The application of No Active Intervention would allow natural coastal processes to operate including erosion. Again for the draft SMP this was not recommended as an overall management strategy at present due to the unquantified potential risk of releasing buried contaminants from the Eastriggs site. Therefore of the strategic polices available for PU 2, Hold the Line was proposed.</p>					

## APPENDIX D – POLICY STATEMENTS

SELECTION OF PREFERRED POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	C
Managed Realignment	x	A	A
No Active Intervention	x	x	x

x - Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 2 for the draft SMP was to implement a Hold the Line policy, across all epochs. A Hold the Line policy currently applies to the frontage at Browhouses, the existing private defences are in reasonable condition and should be maintained by the relevant owner over the short term. The maintenance of these defences may also benefit Scottish Water infrastructure. The promotion of a Hold the Line policy for the remainder of the policy unit was based on the precautionary principle due to the potential for former munitions activities at the Eastriggs site to have left a legacy of contamination. Depending on the nature and extent of potential contamination at the Eastriggs and Torduff Point sites, other alternative policies such as Managed Realignment may be appropriate and hence these should be reviewed further, ahead of implementing any new measures to Hold the Line. Thus, the draft SMP stated that identification of the preferred policy for PU 2 retained a degree of uncertainty until the contamination status of the Eastriggs and Torduff Point sites was fully understood.

It is important to note that implementation of the recommended policy will be subject to funding and resource availability to take any required measures forward. Any recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consenting which may help to clarify the need to implement a Hold the Line policy in certain areas.

The draft SMP suggested that the preferred policy of Hold the Line should be applied to the entire coastal extent of PU 2 and across all epochs, although the final spatial extent of defences should be determined by the degree of potential contamination. As stated previously, the emplacement of any hard defence should be subject to a more detailed scheme level appraisal. The draft SMP acknowledged that if no potential contamination risk was identified, then Managed Realignment should be considered as an alternative policy across the medium- and long-term epochs.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement on the preferred policies, undertaken during March and April 2021.

However, the Dynamic Coast second phase dataset, provided an update on the extent of future coastal erosion associated with PU 2. This indicated a risk of erosion impact to Scottish Water assets, including the clean water network, which makes a policy of No Active Intervention (previously considered as an alternative policy for certain areas) less favourable in some areas, although Managed Realignment remains an option for consideration as an alternative.

Following the public and stakeholder engagement on the Action Plan, undertaken during November 2021, MoD Eastriggs representatives advised that they considered Hold the Line to be inappropriate.

**APPENDIX D – POLICY STATEMENTS**

Managed Realignment in the short term was their preferred policy as it would allow for the identification of a line around specific areas of contamination that are currently being remediated. Following contamination remediation, they suggested that No Active Intervention should be reconsidered. In response to the consultation on the draft SMP, the MoD provided information demonstrating a low level of potential contamination at the seaward end of the Eastriggs site, which opened up the possibility of adopting policies of Managed Realignment or No Active Intervention, subject to the risk to the Scottish Water assets being managed.

**STAKEHOLDER ENGAGEMENT OUTCOME**

The Preferred Policy, as presented during the initial stakeholder engagement phases was updated to replace No Active Intervention with Managed Realignment, as an alternative policy in the draft SMP. Following receipt of the MoD consultation response on the draft SMP, Managed Realignment (with No Active Intervention as a possible alternative) has been prompted to the main policy for the majority of the coastline in PU2 with Hold the Line over the short term and Hold the Line or Managed Realignment in the medium to long term for the areas at Browhouses and Dornock with existing defences. Figure 2.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 2.

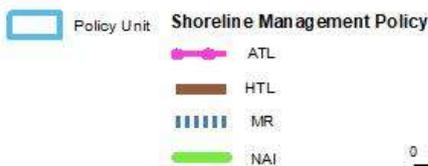
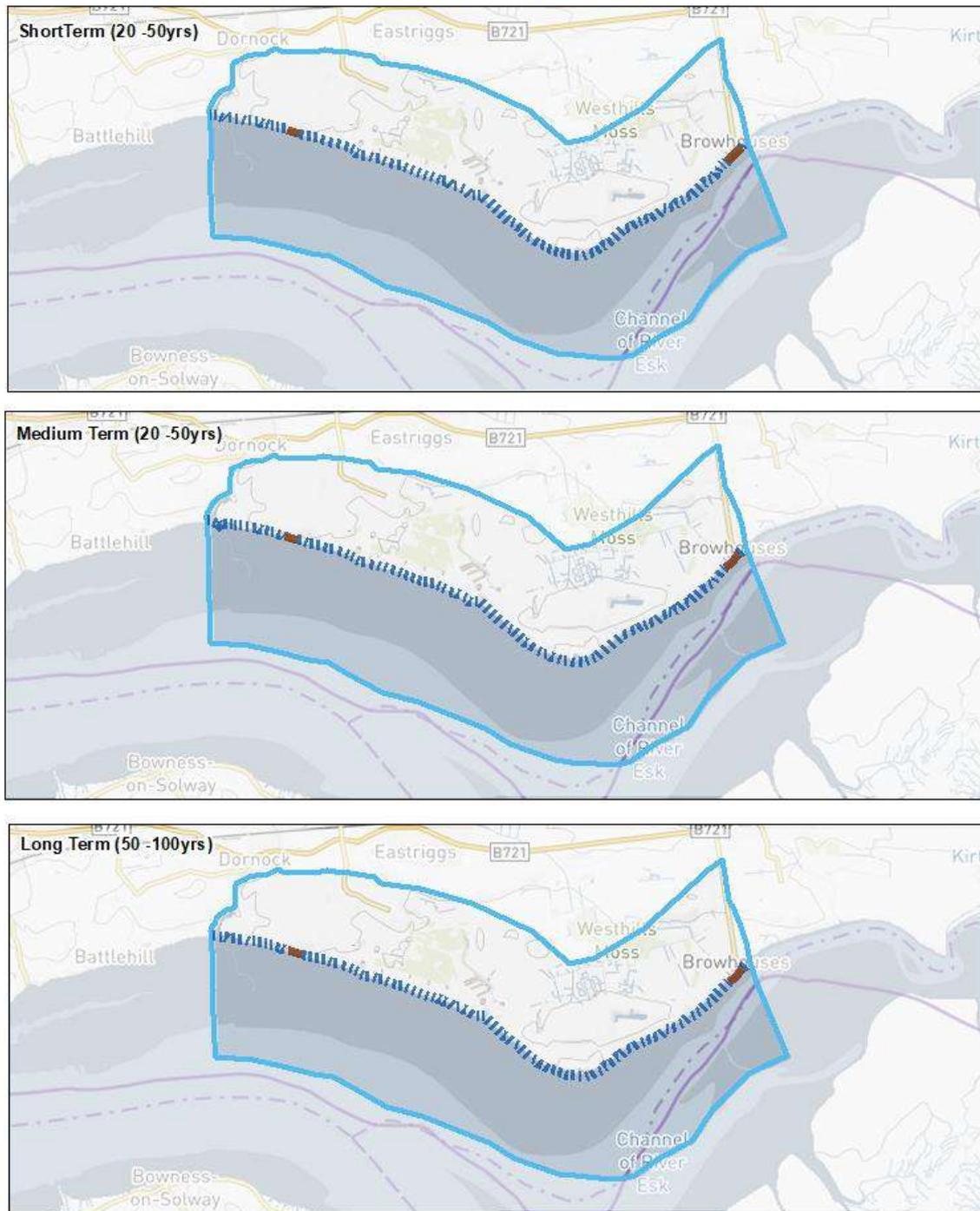
**PREFERRED POLICY FOR FINAL SMP**

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	A*	A*
Managed Realignment	C	C*	C*
No Active Intervention	A	A	A

- x - Reject
- C – Consider
- A – Alternative
- \* Localised

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 2.2 Policy Unit 5 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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D2.3 PU 3 – Dornock Burn to Waterfoot



Figure 3.1 Policy Unit 3 Coastal Flood and Erosion Risk

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## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 3 extends from the Dornock Burn (NY227653) in the east to Waterfoot (NY190645) in the west and includes about 4km of shoreline within CPU 1, the dynamic inner section of the Solway Firth.

The shoreline is mainly composed of soft (erodible) material, with areas of saltmarsh occurring intermittently between the Dornock Burn and Waterfoot. At low tide an extensive area of intertidal sands and the channel of the River Eden are exposed. The River Annan flows into the Solway Firth at the western extent of PU 3, passing Waterfoot.

Battlehill and Seafield are the main settlements located here. The hinterland is relatively level and low lying and is dominated by agriculture.

There are environmentally designated sites within PU 3, with the entirety of the coastline within this policy unit located within the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC.

### FLOOD RISK

Based on SEPA strategic flood mapping data, there are 12 homes and nine business premises currently at a medium likelihood coastal flood risk. This is likely to increase to 14 homes and 10 businesses by 2080 due to climate change.

In addition 0.9km of road are currently estimated to be at flood risk, increasing to 1.4km when potential changes due to climate change were considered.

58.5 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 50% of the affected area is Improved Grassland. Due to climate change this will increase to 100 hectares as the hinterland is flat. The annual average damage associated with coastal flooding is £251,750.

There is one item of utility infrastructure estimated to be at risk, the Annan Kenziels Sewage Treatment Works site.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	12	14
Business Premises	9	10
Utilities	1	1
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	0.9	1.4
Transport rail (km)	0	0
Agricultural Land (ha)	58.5	100

#### Summary of Coastal Flood Risk in PU 3

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.

\*Climate change projections are based on UKCP09 projections.

**EROSION RISK**

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown. Within PU 3 the coastal erosion risk is mainly located to the east of Seafield, affecting an area of saltmarsh habitat although there are sections of the Battlehill (700m) core path at erosion risk.

PU 3 contains a dynamic shoreline with areas of accretion as well as erosion, Dynamic Coast estimates that by 2030 the shoreline of PU 3 will have advanced seawards by up to 24m at some locations, whilst receding landwards by up to 7m along other sections of this shoreline. By 2050, Dynamic Coast predicts this shoreline to be predominately erosional. By 2050, there will be 10 homes and six businesses located within the Erosion Vicinity, 0.03km of road situated within the zone of Erosion Influence and 0.21km within the Erosion Vicinity. This includes 0.13km of the Seafield Road that will be within the Erosion Influence.

By 2100, there will be four homes located within the Erosion Influence, seven homes and eight businesses located within the Erosion Vicinity and 0.22km of the Seafield Road within the Erosional Area, with a further 0.03km of road within the Erosion Influence and 0.17km within the Erosion Vicinity. Dynamic Coast also identified Scottish Water Facilities to be at erosion risk including about 0.08km of the Clean Water Network.

Assets within the Erosional Area and Erosion Influence are expected to be affected by coastal erosion. Assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning. The erosion risk to homes, business and roads (all classes) due to anticipated future erosion by 2050 and 2100 within PU 3 is summarised below.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	10	0	0	6	0	0.13	0.21
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	4	7	0	0	8	0.22	0.03	0.17

**Summary of Coastal Erosion Risk in PU 3**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

**APPENDIX D – POLICY STATEMENTS**

**EXISTING COASTAL DEFENCE**

Battlehill is fronted by coastal defences including concrete pitching (NY218650) and upright sloping sleepers (NY217650). The 2002 Coastal Protection Inventory referred to these defences as the Battlehill Breastwork and Sea Wall, these defence assets are privately owned.

**SUMMARY OF EXISTING COASTAL DEFENCE**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Battlehill (Annan002-003)	Private	Wall	4	Repair as necessary	Private properties

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Battlehill (Annan002-003)**

This coastal defence asset is set against a steep and narrow shore for about 0.2km, the foreshore consists of shingle. The presence of this coastal defence benefits several private properties. These defences are in poor condition. The seaward toe consists of rotting timber, while rock armour has an inconsistent profile with large voids. The exposed face is undermined as a result of minimal rock protection. There is also significant vegetation growth on the exposed face. SEPA flood mapping indicates the medium likelihood coastal flood extent to be located landwards of these defences. The repair of these defence assets is recommended. The 2002 Coastal Protection Inventory referred to these defences as the Battlehill one Breastwork and noted that this defence is privately owned.



**Plate 3.1: Annan003 – Promenade**

**APPENDIX D – POLICY STATEMENTS**

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✔	✔	?	✔	Progress Hold the Line, there are potential environmental impacts identified.
Managed Realignment	✔	✘			Managed Realignment is not progressed, since it is economically unviable.
No Active Intervention	✔	✔	?	?	Progress No Active Intervention, there are potential environmental & heritage as well as social impacts identified.
<p>✘ - Reject                      ✔ - Progress                      ? - Progress, however potential for impacts identified                      ! - Progress, however potential for significant impacts identified</p>					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>The SMP05 stated a policy of No Active Intervention for most of this policy unit, but with Hold the Line applied to individual parts and it is recommended that this approach is continued.</p> <p>No Active Intervention will allow the continuation of natural processes across the entire policy unit, while the proposed strategic approach of localised Hold the Line applied to existing coastal defence locations will protect homes and businesses, coastal roads and Scottish Water assets, particularly those located at Battlehill and Seafield. Thus, this policy would not preclude privately funded maintenance of existing coastal defence, subject to the usual consents.</p> <p>Over the long term, the relocation of access routes, including the Seafield and Battlefield Roads as a form of Managed Realignment may improve the resilience of the roads. However, if the present road is abandoned and allowed to fall into disrepair, it is likely that the vulnerability of adjacent properties to coastal erosion will increase. It is unlikely that this approach will achieve wider environmental objectives therefore increasing the erosion resilience of the road with 'Green' estuary edge protection methods and natural defence management should be investigated further.</p> <p>Within PU 3 there is an effluent outfall pipe that originates from the former Chapelcross nuclear power station located outside of Annan. Chapelcross is currently managed by the Nuclear Decommissioning Authority (NDA) and a private decommissioning company, having ceased operating as a power station in June 2004. At this location, localised Hold the Line is recommended until the completion of planned decommissioning operations and the outfall is no longer required.</p> <p>A policy of No Active Intervention would be acceptable along the majority of the frontage of PU 3 which includes areas of internationally important intertidal flats and saltmarsh habitat, including the Annan Merse. Any Hold the Line measures will need to take into account the potential for any impacts on areas</p>					

## APPENDIX D – POLICY STATEMENTS

of internationally designated habitats within the Upper Solway Flats and Marshes SPA and Ramsar and the Solway Firth SAC.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	x	A*	A*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \* Localised area only

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach is to allow the coastline in PU 3 to function as naturally as possible, through the implementation of a general policy of No Active Intervention. This will allow internationally significant saltmarsh and intertidal sand flats to evolve naturally. The management approach should also permit the implementation of a localised Hold the Line policy, through the repair and maintenance of existing private coastal defences at Battlehill although in the longer term it may be necessary to consider a move to managed realignment. A localised Hold the Line policy is also recommended at the Seafield pipeline until the completion of planned decommissioning operations. Access roads threatened by erosion should be maintained for as long as it is sustainable and possible to do so. 'Green' estuary edge protection methods and natural defence management should be investigated to improve the resilience of the road to coastal erosion. Any measures should be implemented so as not to interfere with existing coastal processes or habitat.

It is noted that privately managed and funded defences are not the responsibility of Dumfries & Galloway Council.

It is important to note that activities to implement the recommended policy might be subject to funding and resource availability and should be subject to more detailed scheme level appraisal and the granting of appropriate consents and permissions.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 3 and across all epochs, as shown in Figure 3.2. The localised Hold the Line policy will only apply to the pipe that originates from the former Chapelcross nuclear power station located outside of Annan and the existing defences at Battlehill. It is also suggested that the continued maintenance of the Seafield Road, may be beneficial to the resilience of several properties located here.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

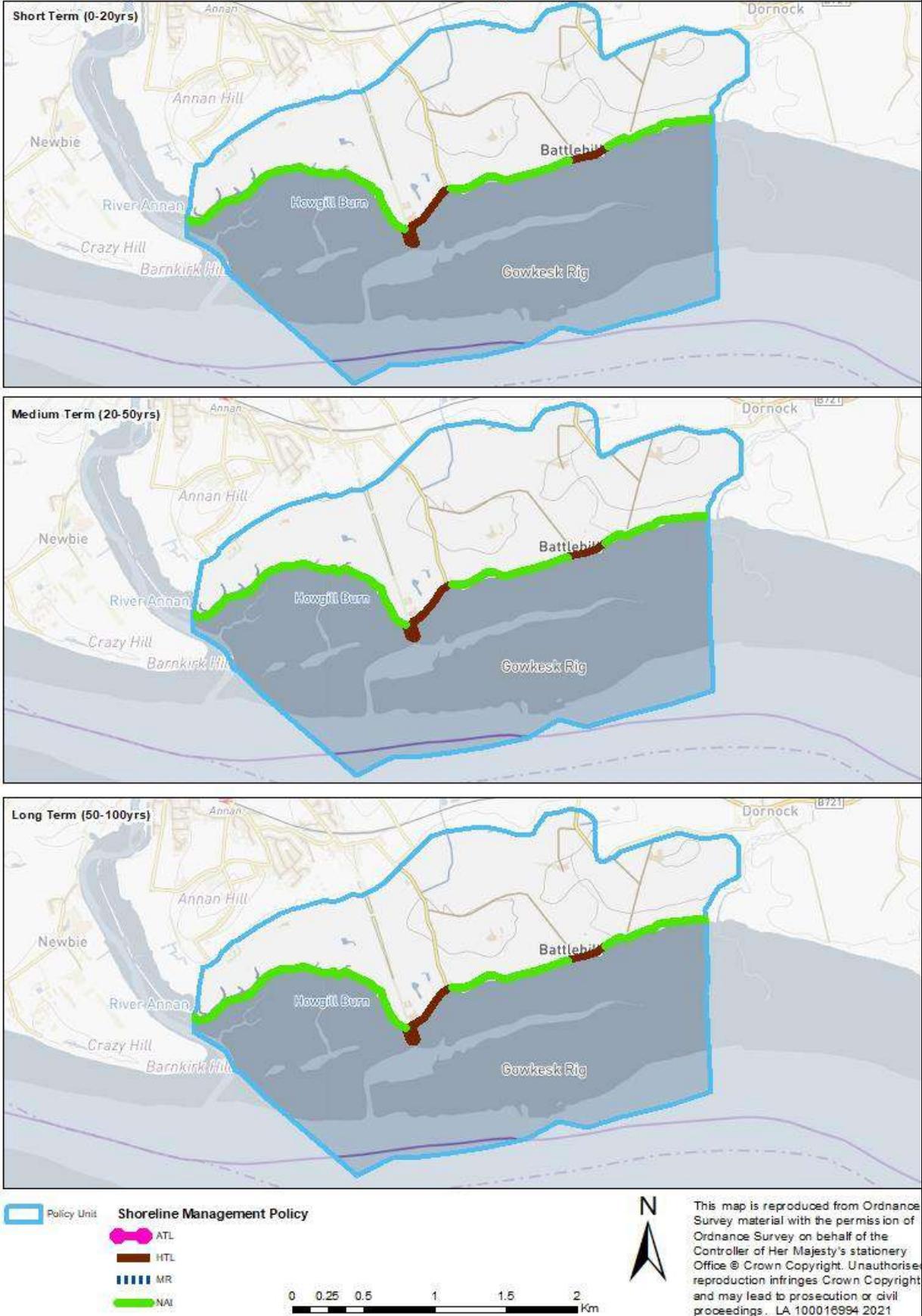
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for the Dumfries & Galloway shoreline, this did not change the 'Preferred Policy' for PU 3.

STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, as presented during the stakeholder engagement was not updated, thus a policy of No Active Intervention with Localised Hold the Line should be applied to PU 3 across all epochs. Figure 3.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 3.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 3.2 Policy Unit 3 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D2.4 PU 4 – Waterfoot to Nethertown

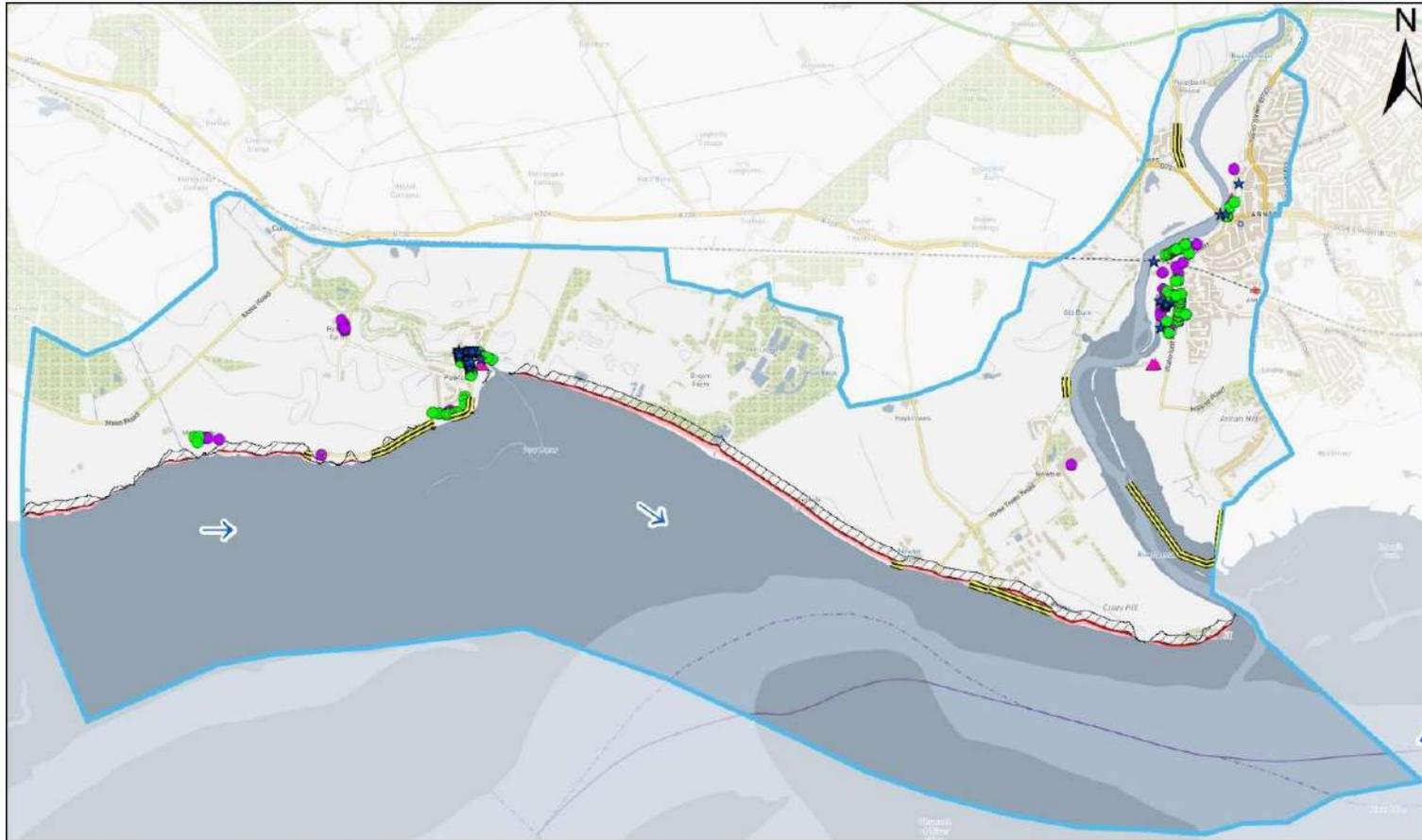


Figure 4.1 Policy Unit 4 Coastal Flood and Erosion Risk

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**DESCRIPTION OF POLICY UNIT**

PU 4 extends from Waterfoot (NY190645) in the east, past Powfoot and towards Nethertown (NY123652) in the west and includes approximately 7.5km of shoreline within CPU 1, the dynamic inner section of the Solway Firth. PU 4 also includes the tidal reach of the River Annan from Waterfoot – Barnkirk Point to the A75 road bridge upstream of Annan.

At low tide an extensive area of intertidal sands including the Priestsie Bank is exposed, with the Channel of the River Eden incised through these sands. The River Annan and Pow Water both enter the Solway Firth within PU 4 and both are tidally influenced. The shoreline is mainly composed of soft (erodible) material, with areas of saltmarsh located to the west of Powfoot and along the east bank of the River Annan. There are also sections of shingle and mudflat along the shoreline.

The town of Annan is the main settlement within PU 4 and is located along the banks of the River Annan, set back from the coast. The settlement of Powfoot is located on the coast at the mouth of the Pow Water. Annan and Powfoot have been identified as Objective Target Areas (OTA) by SEPA. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. It also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

There are several industrial complexes located on the coast at Newbie, close to the mouth of the River Annan. The surrounding hinterland is relatively level, flat and dominated by agriculture and active sandpits.

There are environmentally designated sites within PU 4, with the entirety of the coastline within this Policy unit located within the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC. In addition, Royal Ordnance, Powfoot SSSI extends inland from the coastline to the east of Powfoot, while the area westwards from Moss-side is designated as Caerlaverock National Nature Reserve. The Natterjack Toad (*Epidalea calamita*) is also found in this area.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, there are 115 homes and 36 business premises at a medium likelihood coastal flood risk. This is likely to increase to 191 homes and 61 business premises by 2080 due to climate change.

In addition, 6.9km of road is affected by coastal flooding including a small section of B road (0.06km). It is expected that this will increase to a flooded length of 9.4km when the anticipated impacts of climate change are considered. The NFRA data also indicates approximately 0.16km of railway track to be at risk of medium likelihood coastal flooding, increasing to 0.18km due to climate change.

53.9 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 46% of the affected area is Arable and Horticulture. Due to climate change this will increase to 85.8 hectares as the hinterland is relatively low level. The annual average damage associated with coastal flooding is £502,192.

There are four utilities identified to at medium likelihood coastal flood risk. These are Scottish Water facilities located at Powfoot and Annan. Due to climate change, an additional utility located in Annan is subject to coastal flood risk.

There are 40 cultural heritage features at a medium likelihood coastal flood risk, these include listed buildings located within the Powfoot and Annan Conservation Area. There is also a Scheduled Monument located within Annan Conservation Area shown to be at medium likelihood flood risk, a Motte and Bailey castle. Listed buildings at coastal flood risk are expected to increase to 49 by 2080 due to climate change.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	115	191
Business Premises	36	61
Utilities	4	5
Community facilities	0	0
Cultural Heritage	40	49
Transport roads (km)	6.9	9.4
Transport rail (km)	0.16	0.18
Agricultural Land (ha)	53.9	85.8

### Summary of Coastal Flood Risk in PU 4

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

Dynamic Coast outputs indicate extensive areas of coastal erosion across almost the entire undefended frontage of PU 4 with a significant section of the Annandale way Core Path at erosion risk. Dynamic Coast estimates that by 2030 the shoreline of PU 4 will have receded landwards by up to 9m along some sections of this shoreline with the entire shoreline subject to a degree of erosion by 2050 as shown in Figure 4.1.

By 2050, there will be six homes and 13 businesses located within the Erosion Vicinity, in addition, 0.08km of access road at Newbie Barns will be within the Erosional Area and directly impacted by coastal erosion, while 0.03km will be within the Erosion Influence and 0.47km within the Erosion Vicinity.

By 2100, there will be three homes and three businesses located within the Erosional Area, these properties are anticipated to be directly impacted by coastal erosion, additionally there will be one home and five businesses located within the zone of Erosion influence. Properties located within the Erosion Vicinity by 2100 include five homes and 12 businesses. The length of road located within the Erosional Area by 2100 will be increased to 0.13km of road located at Newbie Barns and Newbie Mains. Dynamic Coast has also identified some Scottish Water Facilities to be at erosion risk by 2100, including 0.87km of the Clean Water Network. Additionally, approximately 16.8ha of Upper Solway Flats, SSSI and a 309ha section of Caerlaverock NNR situated within PU 4 (at Moss Side) will potentially be lost to erosion.

Assets within both the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	6	0	0	13	0.08	0.03	0.47
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
3	1	5	3	5	12	0.13	0.19	0.80
<b>Summary of Coastal Erosion Risk in PU 4</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p> <p>Refer to <a href="http://dynamiccoast.com/">http://dynamiccoast.com/</a> for further details relating to the Dynamic Coast erosion information.</p>								

### EXISTING COASTAL DEFENCE

There are several coastal defence structures located within PU 4. There are sections of coastal defence located at Newbie, Powfoot and Waterfoot, these include walls, embankments and promenades. Within Annan, no coastal defences were identified. Defences that run beside River Park Road (Annan01) to the west of Annan (NY188669) are not coastal defences and hence are not considered further. This roadside wall is well beyond the medium likelihood present day and future coastal flood extent. The majority of coastal defences located here are privately owned (NY189644) including those located to the east of the industrial site along the bank of the River Annan.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Waterfoot (Wfoot001)	Private	Raised earthen embankment	5	Remove from register. No further maintenance required	
Newbie North (Newb005)	Council (Roads)	Embankment	3	Further inspection required	River Annan footpath
Newbie Barns (West) (Newb004)	Private	Rock armour	3	No recommendation	Former industrial site
Newbie Barns East (Newb003)	Private	Rock armour	3	No recommendation	Homes & businesses

## APPENDIX D – POLICY STATEMENTS

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Newbie Mains (East) (Newb002)	Private	Revetment	3	General maintenance	Homes & businesses
Newbie Mains (West) (Newb001)	Private	Promenade	3	General maintenance	Homes & businesses
Powfoot Village (Pow005 & 006)	Council (Roads)	Promenade	4	Further inspection required	
Powfoot West (i) (Pow004)	Private	Promenade	4	Further inspection required	Businesses, minor road, recreation
Powfoot West (ii) (Pow001, 002 & 003)	Council (Roads)	Wall	3 / 4	Continued to monitor	

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### Waterfoot (Wfoot001)

The coastal defence at Waterfoot consists of an earthen embankment behind which a single track road is located. The asset condition survey noted that these defences are extensively eroded with tree roots exposed, and rubble placed on the landward face to potentially prevent further erosion. In its present state this defence scored a Condition Grade of 5 (Very Poor). Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence.

Historic maps of the area show that the Waterfoot embankments existed during the 19<sup>th</sup> Century and appear to have protected reclaimed agricultural land and two buildings located to the west of the embankment (NY190647). By the mid-20<sup>th</sup> Century these buildings were no longer present. Aerial photographs of this site show that the reclaimed farmland has been breached as evident by the presence of intertidal creeks. Coastal saltmarshes and saline reed beds currently dominate this area. It is concluded that these relict flood defences benefit the coastal habitats and species, including Internationally designated environmental sites.



**Plate 4.1: Wfoot001 (Raised Earthen Embankment)**

**Newbie North (Newb005)**

There are coastal flood defences located to the north of Newbie and along the west bank of the River Annan (NY182656). Since these defences are positioned along the cut bank of a meander, it is assumed that they offer erosion protection. These defences are in fair condition. The 2002 Coastal Protection Inventory referred to these defences Newbie, West Bank, rock armour. These defences protect a footpath from the tidal River Annan. These defences are council owned (Roads).



**Plate 4.2: Newb005 (Embankment)**

**Newbie Barns (West) (Newb004)**

At Newbie Barns (West) rock armour protects the seaward edge of a former petrochemical plant and a number of homes (NY179644). The SEPA medium likelihood coastal flood extent at Newbie Barns does not extend landwards of the defences.

There is no protection along the north-east side of this site, and floodwaters are shown to inundate the former industrial complex via the unprotected west bank of the River Annan. These defences are in fair condition, privately owned, and their presence benefits coastal residential properties.



**Plate 4.3: Newb004 (Rock Armour)**

**Newbiebarns (East) (Newb003)**

At Newbie Barns (East) rock armour protects the seaward edge of several homes. The SEPA medium likelihood coastal flood extent does not extend landwards of these defences. These defences are in fair condition. The 2002 Coastal Protection Inventory referred to these defences as Newbie Rock Protection, these defence assets are privately owned.



**Plate 4.4: Newb003 (Rock Armour)**

**Newbie Mains (East) (Newb002)**

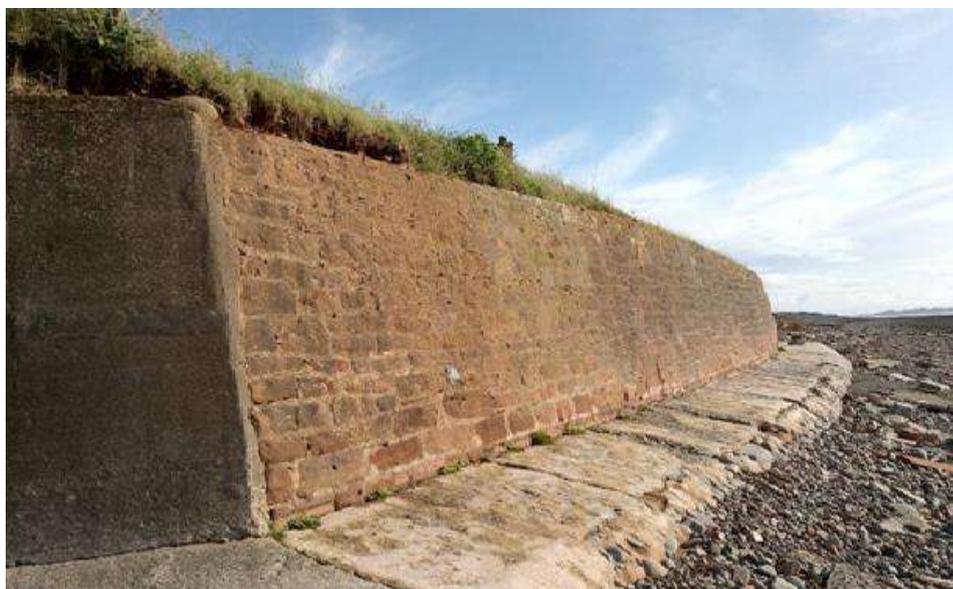
Coastal defences have been constructed to protect the access track fronting the farmhouse and buildings at Newbie Mains (NY172646). SEPA flood mapping indicates medium likelihood flood extents do not extend landwards of the Newbie Mains (east) coastal defences. The asset condition survey described the wall located to the east of Newbie Mains to be in fair condition with minor cracking. The 2002 Coastal Protection Inventory referred to these defences as the Newbie Mains Sea Wall, these defence assets are privately owned.



**Plate 4.5: Newb002 (Revetment)**

**Newbie Mains (West) Newb001)**

The defences located to the west of Newbie Mains have shingle built up along the toe. SEPA flood mapping does not indicate the medium likelihood coastal flood extent to extend landwards of the Newbie Mains (west) coastal defences. These defences are in fair condition. The area to the west of these defences is privately owned and includes a dumped clay embankment (NY172646). The 2002 Coastal Protection Inventory referred to these defences as the Dumped Clay Embankment and Seawall these defence assets are privately owned.



**Plate 4.6: Newb001 (Promenade)**

Further east, Newbie Villa lies at the outer edge of the projected 2050 area of erosion influence (being 10 m from MHWS in 2050, based on uniform rates). An industrial complex, a former petrochemical plant, at Newbie has some coastal defences along its frontage that may limit the landward progression of coastal erosion, however as these defences are discontinuous there still remains a significant potential for continued erosion along the coast to the east. The loss of land through coastal erosion is a major issue associated with this policy unit.

**Powfoot Village (Pow005 & 006)**

At Powfoot coastal defence assets front the village. Rock armour located at Powfoot was described as being well vegetated for the most part. Where the rock armour was clear of vegetation, it was identified to have voids and the profile was inconsistent. These defences are in poor condition. Based upon SEPA flood mapping, these defences are breached during a medium likelihood flood. These features are Council (Roads) assets.



**Plate 4.7: Pow005 (Promenade)**

**Powfoot (West) (i) (Pow004)**

The golf course frontage, minor coastal road and caravan site benefit from the presence of the existing coastal defences. SEPA flood mapping indicates that medium likelihood coastal flooding does not extend landwards beyond the position of the coastal defences. These defences are in poor condition. There is an extensive area of saltmarsh habitat located seawards of these defences. These defences are privately owned by the caravan park and golf course.



**Plate 4.8: Pow004 (Promenade)**

**APPENDIX D – POLICY STATEMENTS**

**Powfoot (West) (ii) (Pow001, 002 & 003)**

The coastal defences to the west of Powfoot village and the rock gabions located towards the carpark are overgrown by vegetation. These defences are breached during a medium likelihood coastal flood event, with flooding extending landwards of these defences. These defences are in poor condition. The 2002 Coastal Protection Inventory referred to these defences as the Powfoot Seawall, these are Council (Roads) owned assets.



**Plate 4.9: Pow002 (Wall)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✓	?	✓	Progress Hold the Line, potential environment and heritage impacts identified.
Managed Realignment	✓	✓	?	?	Progress Managed Realignment, potential environment & heritage and social impacts identified.
No Active Intervention	✓	✓	✓	?	No Active Intervention is recommended for areas identified as 'low risk'.

- x - Reject
- ✓ - Progress
- ? - Progress, however potential for impacts identified
- ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

The SMP05 Policy for this section of the Dumfries & Galloway coast was to Hold the Line. Given the level of coastal flood and erosion risk identified for this policy unit it is recommended that a Hold the Line policy should be continued by maintaining existing coastal defences into the future, for as long as it is sustainable. If Hold the Line should become unsustainable, a Managed Realignment policy should be considered as it is anticipated that as future flood and erosion risks increase with climate change, this option may be more viable. Elsewhere, along this shoreline a policy of No Active Intervention is recommended.

It is predicted that defences along this coastline will continue to deteriorate and the risk of coastal erosion increase, hence more substantial works are likely to be required to continue to protect the industrial assets, properties and roads located at Newbie. There is also a potential wave overtopping risk at Powfoot as well as a combined fluvial and coastal flood risk. This area is an OTA and will be subjected to further detailed assessment. Annan is also an OTA and strategic solutions, and recommended actions are forthcoming. Development of any substantial defences would need to take into account the potential for direct or indirect impacts on areas of internationally designated habitats within the Upper Solway Flats and Marshes SPA and Ramsar and the Solway Firth SAC.

Managed Realignment is not identified as a short term policy, as it is recognised that time is required for managed realignment adaptation approaches to be investigated and implemented. Relocation of properties, diversion of a minor road and relocation of utilities currently identified to be at risk, may be significantly more sustainable than options to continue to Hold the Line indefinitely. This policy has potential to lead to social impacts relating to loss of properties. However, Managed Realignment may also provide opportunities for the expansion of coastal habitats such as saltmarsh in the future, therefore achieving wider environmental objectives.

**SELECTION OF POLICY**

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	C	x	x
Hold the Line	C	C*	C*
Managed Realignment	C	A*	A*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \*Localised where low risk to assets exists

**SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY**

The preferred shoreline management approach for PU 4 is to implement a localised Hold the Line policy over all epochs for sections of the coast that are presently defended. In the short and medium term, works will be required to maintain and repair the existing defences, over the long term, this preferred policy will become increasingly costly and challenging to maintain and consideration may need to be given to moving towards a Managed Realignment policy. Elsewhere, a Policy of No Active Intervention is recommended as shown in Figure 4.2.

Over the medium and long term, higher coastal defences will become necessary, with the result that some coastal defence structures may have to be raised more than 2.5m above existing ground levels to manage the future flood risk, particularly in areas where a wave overtopping risk is identified. Where modification to defences is required, consideration will be needed on the potential for impacts on internationally designated environmental sites within the area.

## APPENDIX D – POLICY STATEMENTS

It is important to note that implementation of the recommended policy will be subject to funding and resources being available to implement the necessary measures. Recommended schemes should be subject to more detailed scheme level appraisal and the granting of appropriate consents and permissions.

The preferred policy of PU 4 comprises a mix of both HTL and NAI, see Figure 4.2 which provides a guide of the spatial extent of the preferred shoreline management approach across PU 4. An alternative policy of Managed Realignment in conjunction with No Active intervention should be considered over the medium and long term if Hold the Line becomes unsustainable. Where private coastal defences already exist, these should be maintained subject to necessary consents being granted, elsewhere a policy of No Active Intervention should apply.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, NatureScot recommended that No Active Intervention should be considered for this shoreline, where the 'risk' was deemed to be low. A policy of HTL (to the medium term at least) is likely to mean new defences, possibly less ad hoc than previous interventions. NatureScot considered this could impact the Solway Firth SPA and SAC, depending on the selection, design and scale of interventions, and stressed the following additional issue relating to the Upper Solway SSSI.

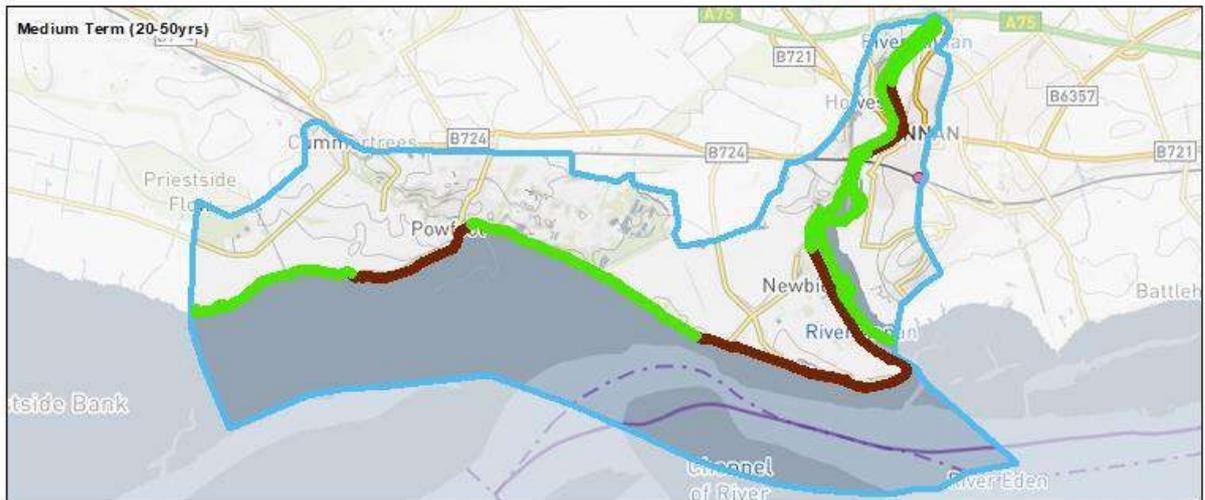
The coast between Newbie Mains and the Pow Water includes two nationally important interests of the Upper Solway SSSI: shingle habitat, and deposits that are part of a geological interest. Both could be adversely impacted under the HTL policy, directly and / or indirectly, whether by new defences or by 'soft' interventions such as beach nourishment. Also, erosion along this coast supplies sediment eastward, which provides nature-based support to defences at Newbie Mains and beyond. NatureScot therefore recommended a NAI policy between Newbie Mains and Pow Water, with planning for long term relocation of assets.

### STAKEHOLDER ENGAGEMENT OUTCOME

Having considered the observations provided by NatureScot during the stakeholder engagement period, the 'Preferred Policy' of Hold the Line in areas currently protected by defences over all epochs was maintained, with Managed Realignment to be considered as an alternative over the medium and long term. However, No Active Intervention was identified for all epochs in areas not currently protected by defences. Figure 4.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 4.

**GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES**

**Figure 4.2 Policy Unit 4 Geographical Extent of Preferred Policy (0-100yr) All Epochs**



 Policy Unit	<b>Shoreline Management Policy</b>	 	This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. LA 100016994 2021
 ATL	 HTL		
 MR	 NAI		

D2.5 PU 5 – Nethertown to Drum Mains

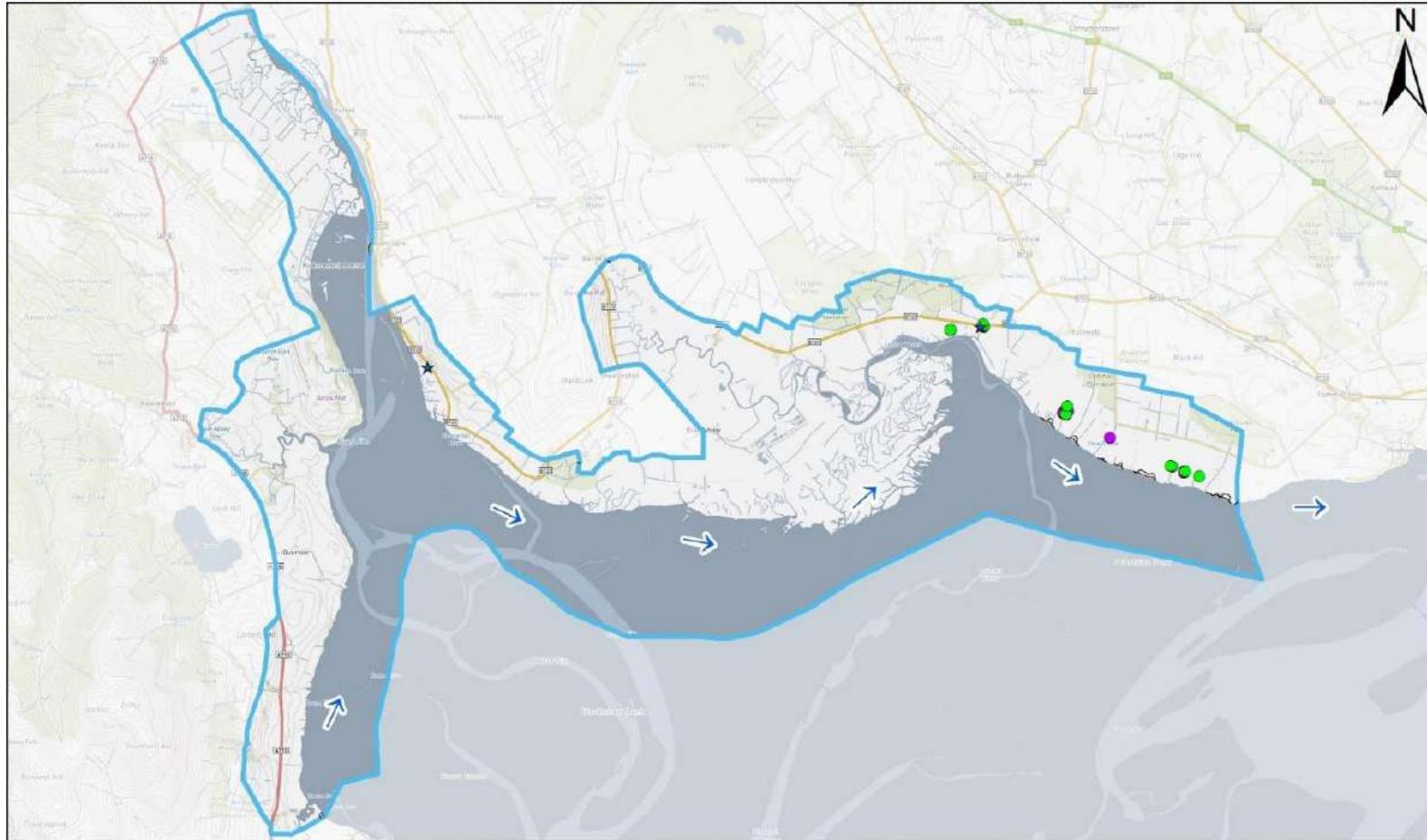


Figure 5.1 Policy Unit 5 Coastal Flood and Erosion Risk

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 5 extends from Nethertown (NY123652) in the east to Drum-Mains (NX979597) in the west and includes the left bank of the River Nith downstream of Glencaple and the right bank downstream of Flatts of Cargen. PU 5 includes approximately 40.7km of shoreline including the tidally influenced section of the Lochar Water and part of the River Nith. This section of shoreline is within CPU 1, the dynamic inner section of the Solway Firth. At low tide an extensive area of intertidal sand and mud including the Priestside and Blackshaw Banks are exposed. The shoreline is mainly composed of soft (erodible) material, there are areas of saltmarsh and mudflat exposed at Caerlaverock, Kirkconnell Merse, Priestside Bank and Carse Bay. There are several settlements located within PU 5, along with large agricultural units, individual dwellings and hamlets. Much of the hinterland is flat and low-lying land with the land-use dominated by agriculture.</p> <p>There are environmentally designated sites within PU 5. Much of this area includes intertidal mud and sandflats including extensive areas of saltmarsh habitat. The Natterjack Toad (<i>Epidalea calamita</i>) is also found in this area. The entirety of the coastline within this PU is within the Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC. Much of this coastline is also designated as Caerlaverock National Nature Reserve and the Nith Estuary National Scenic Area.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data, there are 12 homes and 15 business premises at a medium likelihood coastal flood risk. This is likely to increase to 20 homes and 42 business premises by 2080 due to climate change. In addition, 5.1km of road is presently shown to be at risk of flooding including 2.26km of the B725, increasing to 7.7km of road including 3.27km of the B725, when the anticipated impacts of climate change are considered. 582 hectares of agricultural land is also at risk of medium likelihood coastal flooding as the hinterland is flat. Approximately 46% of affected land is Arable and Horticulture and 36% is Improved Grassland. Due to climate change this will increase to 731 hectares. The annual average damage associated with coastal flooding is £147,882. Three cultural heritage features are at medium likelihood coastal flood risk, the Listed Buildings are located in Kirkconnell (NY002669) and at Brow Well (NY085675). In the future this will increase to four to include the Scheduled Monument, Caerlaverock Castle.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	12	20
Business Premises	15	42
Utilities	0	0
Community facilities	0	0
Cultural Heritage	3	4
Transport roads (km)	5.1	7.7
Transport rail (km)	0	0
Agricultural Land (ha)	582	731
<p><b>Summary of Coastal Flood Risk in PU 5</b></p> <p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		

## APPENDIX D – POLICY STATEMENTS

EROSION RISK					
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>Due to a high level of uncertainty associated with the response of saltmarsh to sea level rise and hence the erosion potential of coastline fronted with saltmarsh, Dynamic Coast does not provide data on projected coastal change for much of PU 5 as an extensive area of salt marsh area is located in the west of PU 5, at Caerlaverock. In the east of PU 5, Dynamic Coast shows areas of accretion as well as erosion associated with this dynamic shoreline. Dynamic Coast estimates that by 2030 the shoreline of PU 5 will have advanced seawards by up to 15m at some locations, whilst receding landwards by up to 4m along other sections of this shoreline. By 2050, it is estimated that the effect of sea level rise will result in the shoreline of PU 5 being predominately erosional. No assets are identified to be at risk of coastal erosion.</p>					
EXISTING COASTAL DEFENCE					
<p>There are no formal coastal defences located within PU 5. However, there is some evidence of informal coastal defences that protect agricultural and private land. Informal defence are non-designated structures or features that help to manage flood risk or coastal erosion. These defences are not the responsibility of the local authority.</p> <p>There are traces of raised earthen embankments located to the east of Midtown (NY108658) and Stanhope (NY084673). Historic maps (1861 Ordnance Survey) show these features as relict embankments, it is assumed that these features represent historical efforts to reclaim land for agriculture and their current maintenance status is unknown. This area is fringed with saltmarsh and according to Dynamic Coast, shows evidence of sediment accretion.</p> <p>To the west of the Lochar Water there are embankments that protect farmland (NY058665) on both sides of the river. These defences show evidence of erosion and possible breaching.</p> <p>Based upon the NFRA coastal flood extents, these relict earthen defences offer no flood effective protection during a medium likelihood flood event.</p>					
REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x			Not progressed as Hold the Line policies are unlikely to be economically justified.
Managed Realignment	✓	✓	?	?	Managed Realignment is progressed, although potential Environment & Heritage and social impacts are identified.
No Active Intervention	✓	✓	✓	?	No Active Intervention is progressed, although potential social impacts are identified.
<p>x - Reject                      ✓ - Progress                      ? - Progress, however potential for impacts identified                      ! - Progress, however potential for significant impacts identified</p>					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>The SMP05 recommended a policy of No Active Intervention for the section of coastline included within PU 5. There are no formal coastal defences present and the intention of this policy in the previous Plan was to allow the shoreline to evolve under natural processes. It is uncertain if the implementation of this</p>					

## APPENDIX D – POLICY STATEMENTS

policy will result in the erosion of a significant area of saltmarsh habitat, due to natural processes, however this policy supports the national and international environmental designations associated with this section of the Dumfries & Galloway shoreline. This is an important area for environmental habitats such as saltmarsh, therefore it is important that any new policy should not preclude traditional practices such as grazing to control merse vegetation.

Given the dispersed arrangement of assets at risk there is unlikely to be economic justification for the construction of coastal defences to implement a Hold the Line policy. However, as some properties are at flood risk, localised flood defence or resilience measures may be required and landowners should be permitted to maintain informal or private defences, if required and subject to consent. The likely impact of potential coastal flooding on the Scheduled Monument at Caerlaverock under a No Active Intervention policy would need to be considered by Historic Environment Scotland.

Given that some properties and a section of the B725 are at flood risk and future erosion risk, a localised policy of Managed Realignment should be considered in the medium and long term. This may include the setting back of the current route of the B725 and the abandonment of at risk properties. This policy has potential to lead to social impacts relating to the loss of properties. Managed Realignment of the B725 by its relocation further landward may allow the natural landward expansion of the saltmarsh alongside increasing the flood resilience of the road in the future.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	x	x	x
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \* – Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 5 is No Active Intervention across all epochs with localised Managed Realignment considered as an alternative over the medium and longer term. The landward movement of road assets, homes and business premises may be necessary in the future as coastal flood levels are expected to increase as a response to climate change.

Managed Realignment will allow for the continued natural evolution of the coastline while enabling asset operators to proactively adapt to future coastal change and environmental opportunities. Continued monitoring of the coastline of PU 5 is recommended, subject to availability of funding and resources.

The preferred policy of No Active Intervention should be applied to the entire coastal extent of PU 5 over the short term with localised Managed Realignment introduced during the medium to long term epochs, as shown in Figure 5.2, which provides a guide to the spatial extent of the preferred Shoreline Management Policy. The preferred policy of No Active Intervention should be applied, where possible, with the alternative policy of Managed Realignment only considered where justified over the medium and long term. Where private informal defences already exist, owners should be allowed to continue maintenance, subject to consent being obtained.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, Historic Environment Scotland (HES) raised a concern that Caerlaverock Castle did not feature on the main map (Figure 5.1).

Caerlaverock Castle itself is not identified to be at a coastal flood or erosion risk, therefore it is not featured in Figure 5.1 as an asset at risk, although it is accepted that parts of its extensive grounds may be at risk.

## APPENDIX D – POLICY STATEMENTS

The SEA that accompanies the SMP will identify any potential impacts that could result in the selection of SMP Policy options, including impacts on cultural and heritage assets (up to the next 100 years). We note that this response from HES has provided an opportunity to ensure that their concerns are incorporated into the process.

The Dynamic Coast data set identifies considerable uncertainty in the anticipated future erosion associated with PU 5, this is particularly relevant to the Caerlaverock area due to the presence of the extensive salt marsh area and uncertainty as to how this will respond to future rising sea level.

### STAKEHOLDER ENGAGEMENT OUTCOME

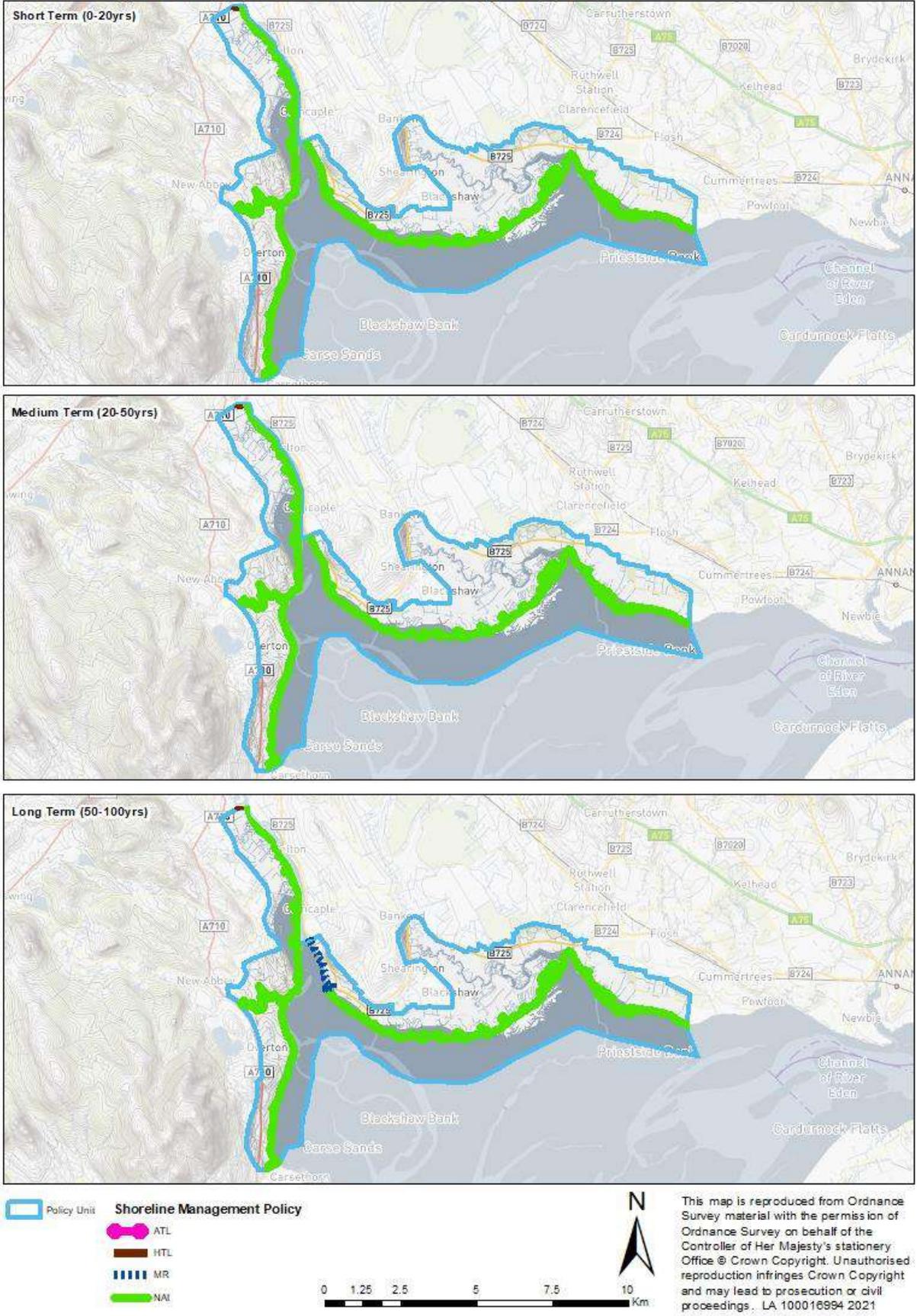
None of the responses received during the stakeholder engagement period provided sufficient justification to change the 'Preferred Policy' of No Active Intervention and thus no alternative policies were considered.

Advice and feedback from HES during subsequent stages of the SMP process should be sought while the document titled 'A Guide to Climate Change on Scotland's Historic Environment'. Mitigation strategy was considered (where risk was identified) during the SEA finalisation.

The Preferred Policy, as presented during the stakeholder engagement remains No Active Intervention over the full extent of the policy unit for the short term, with the potential to introduce localised Managed Realignment for the B725 over the medium to long term. Figure 5.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 5.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 5.2 Policy Unit 5 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D2.6 PU 6 – Glencaple to Dumfries

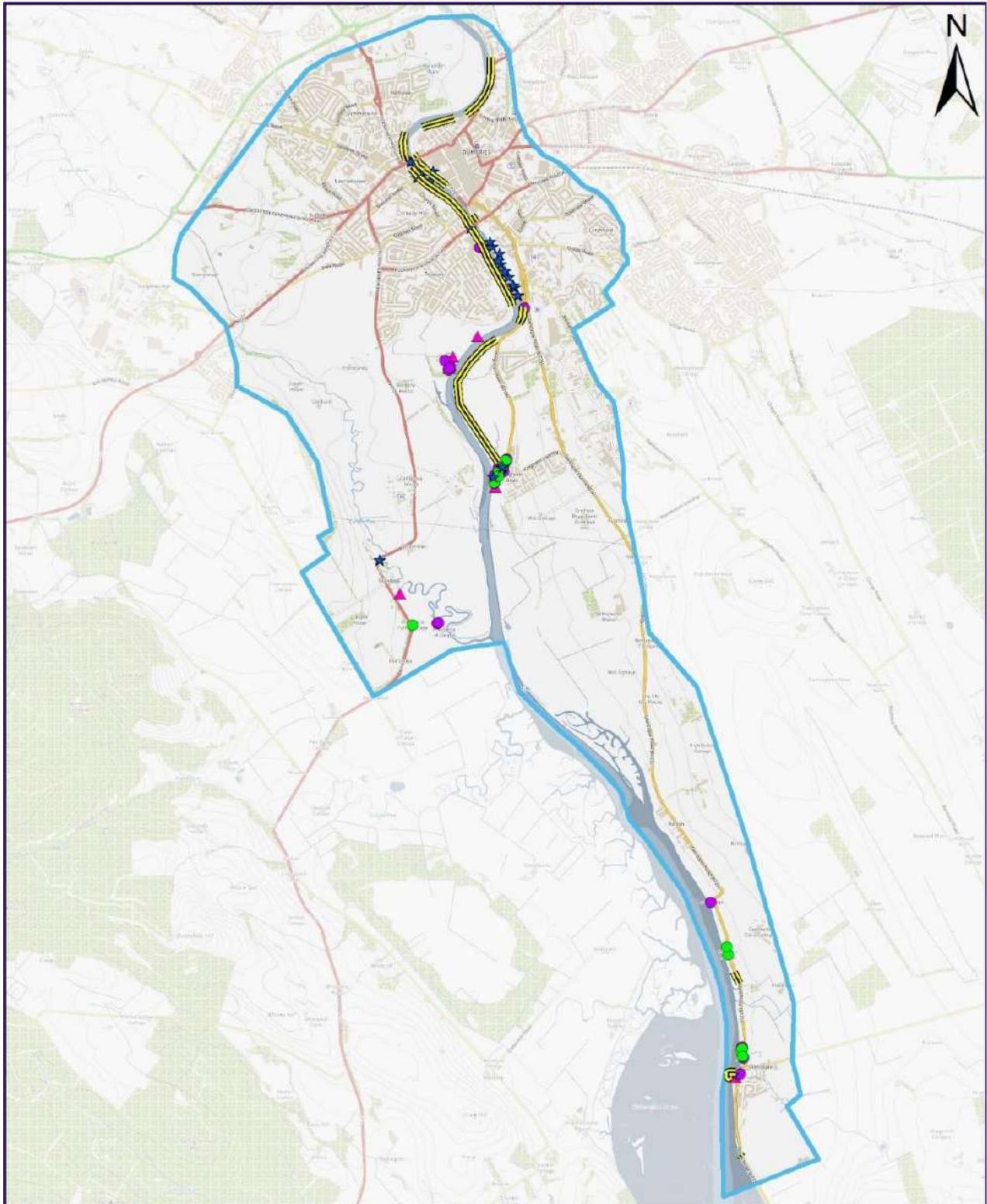


Figure 6.1 Policy Unit 6 Coastal Flood and Erosion Risk

- |                          |                            |                   |
|--------------------------|----------------------------|-------------------|
| Policy Unit              | Residential Properties     | Erosion           |
| Cultural Heritage        | Non-Residential Properties | Erosion Influence |
| Defence Asset            | Utilities                  | Erosion Vicinity  |
| Sediment Drift Direction |                            |                   |

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**DESCRIPTION OF POLICY UNIT**

PU 6 encompasses the tidally influenced extent of the River Nith (NY029703), as it flows in a mainly southerly direction through Dumfries and past Glencaple i.e. the narrow section of the estuary just before it opens out into the Solway Firth (NX997678). PU 6 is included within CPU 1, the dynamic inner section of the Solway Firth.

The banks of the River Nith are heavily modified as it flows through the urbanised area of Dumfries, whilst the remainder of this estuary is composed of soft (erodible) material. There are areas of saltmarsh habitat located upstream of Kingholm Quay, including the Green Merse site identified by the SSS (Saltmarsh Survey of Scotland).

Dumfries is the main settlement within this policy unit, the only other significant settlement being Glencaple located to the south of Dumfries.

SEPA has designated Dumfries as an Objective Target Area, where objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. It also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

There are environmentally designated sites within PU 6. The Upper Solway Flats and Marshes SPA, Ramsar and SSSI and the Solway Firth SAC extend upstream on the River Nith as far as Kelton. The Nith Estuary, as far upstream on the River Nith as the Cargen Pow area is also designated as a National Scenic area.

**FLOOD RISK**

Based on SEPA strategic flood mapping data there are 16 homes and 25 business premises at a medium likelihood of coastal flood risk. This is likely to increase to 44 homes and 44 business premises by 2080 due to climate change.

In addition, about 3.1km of road is presently shown to be at risk of flooding including 0.62km of the A710, A711 and 0.8km of Whitesands and Nith Street. This increases to just over 1.1km of A-road, when the anticipated impacts of climate change are considered. 1.49km of B-road is also at risk of coastal flooding, increasing to 2.4km in the future. Overall, a total road length of 5.2km will be affected in the future.

168 hectares of agricultural land is also at risk of medium likelihood coastal flooding as the hinterland is relatively low-lying. Approximately 45% of the affected area is Arable and Horticulture and 38% is Improved Grassland. Other areas include Improved and Rough Grassland. Due to climate change this will increase to 207 hectares. The annual average damage associated with coastal flooding is £246,240.

There are also nine items of utility infrastructure estimated to be at risk, increasing to 10 in the future due to anticipated impacts of climate change. These are all Scottish Water facilities. There are 22 cultural heritage assets currently identified to be at risk of medium likelihood coastal flooding, these include Listed Buildings and a Scheduled Monument. When predicted potential climate change is considered, an additional 13 cultural heritage assets are affected increasing the total to 35. Dumfries Old Bridge is the only Scheduled Monument at flood risk, whilst most of the Listed Buildings are located within Kingholm, Glencaple and Whitesands.

There is one community facility located at Glencaple that is at flood risk, the Lifeboat Station. The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	16	44
Business Premises	25	44
Utilities	9	10
Community facilities	1	1
Cultural Heritage	22	35
Transport roads (km)	3.1	5.2
Transport rail (km)	0	0
Agricultural Land (ha)	168	207

### Summary of Coastal Flood Risk in PU 6

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase dataset does not extend upstream on the Nith beyond Glencaple. At Glencaple the shoreline has been identified as being stable and no erosion risk is identified. Refer to <https://www.dynamiccoast.com> for further details relating to the Dynamic Coast erosion information.

### EXISTING COASTAL DEFENCE

There are numerous coastal defences located within PU 6, such as those at Dumfries and Glencaple. The Dumfries defences include a section of wall, promenade and raised ground, while Glencaple is currently protected by an area of promenade and embankment. There are also some raised earthen embankments, informal defences, which protect agricultural land. These are located to the south of Dumfries, including the Kelton area where the presence of an earthen embankment benefits surrounding farmland as well as reducing the flood risk to the B725. An earthen embankment also protects the sewage works at Hamilton Starke Park. Privately owned defences at Kelton (NX987707) include stone pitching to protect the edge of a garden. To the south of Glencaple, there is a defence referred to as the Kenneth Bank (NX994680) this is a section of rock armour that protects a layby on the B725. The condition of this coastal defence was not surveyed.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefiting Area
Glencaple Harbour (Glen001)	Private	Promenade	3	Maintenance required	-
Glencaple (Glen002)	Council (Roads)	Embankment	3	Maintenance required	B725

## APPENDIX D – POLICY STATEMENTS

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Glen003	Council (Roads)	Wall	3	Maintenance required	B725 (Shore Road)
Dumfries (North-East) (Dumf001-007)	Council (Roads)	Wall	4	Maintenance required	Homes & businesses
Dumfries East Bank (1) (Dumf008)	Council (Roads)	Embankment	4	Maintenance required	
Dumfries East Bank (2) (Dumf009)	Council (Roads)	Wall	2	Maintenance required	A726
Dumfries West Bank (1) (Dumf010 to 012)	Council (Roads)	Wall	3	Maintenance required	Homes & businesses
Dumfries Dockhead (Dumf013)	Council (Roads)	Promenade	2	Continue maintenance	Homes & businesses *Whitesands
Dumfries Whitesands (Dumf014 to 015)	Council (Roads)	Wall	3	Whitesands Project 2022	*Whitesands
Dumfries Old Bridge (Dumf016 to 018)	Council (Roads)	Wall / Promenade	3	Maintenance required	Homes & businesses
Dumfries Mill Road (Dumf019 to 022)	Council (Roads)	Wall / Promenade	3 / 4	Maintenance required	Road
Mill Green End (Dumf023 to 024)	Council (Roads)	Promenade	3	Maintenance required	*Whitesands

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Glencaple (Glen001)**

At Glencaple Harbour, the masonry walls that comprise the promenade (NX994687) provide protection against erosion. This asset is in fair condition. It is presumed that this is a privately owned asset (Nith Navigational Trust).



**Plate 6.1: Glen001 (Promenade)**

**Glencaple (Glen002 & Glen003)**

Rock armour and an embankment defend approximately 11m of the B725 (Shore Road), to the north of Glencaple (NX994680) and (NX994694). SEPA flood mapping indicates that these coastal defences do not restrict the landward extent of a medium likelihood coastal flood. The asset condition survey noted these defences are overgrown with vegetation and that general maintenance is required. These coastal defence assets are in a fair condition. It is presumed that these are council owned assets.



**Plate 6.2: Glen002 (Embankment) & Glen003 (Wall)**

**Dumfries (North-East) (Dum001-007)**

These defences run adjacent to the A701 and fringe the north-east (left) bank of the River Nith. SEPA flood mapping indicates these defences restrict the landward extent of a medium likelihood coastal flood. The presence of these walls mainly benefits the area upstream of Buccleuch Street Bridge (A780) to the north-east of Dumfries. Sections of these walls are well vegetated, with large exposed cracks. These

## APPENDIX D – POLICY STATEMENTS

walls require maintenance. These defences are in poor condition. It is presumed that these are council owned assets.



Plate 6.3: a. Dum005 & b. Dum007 (Flood Walls)

### Dumfries East Bank (Dumf008)

This is an elongated earthen embankment that fringes the east bank of the River Nith. The embankment protects an area of parkland located upstream of Kingholm. SEPA flood mapping indicates the medium likelihood flooding to extend landward of this defence. These defences are in poor condition. It is presumed that these are council owned assets.

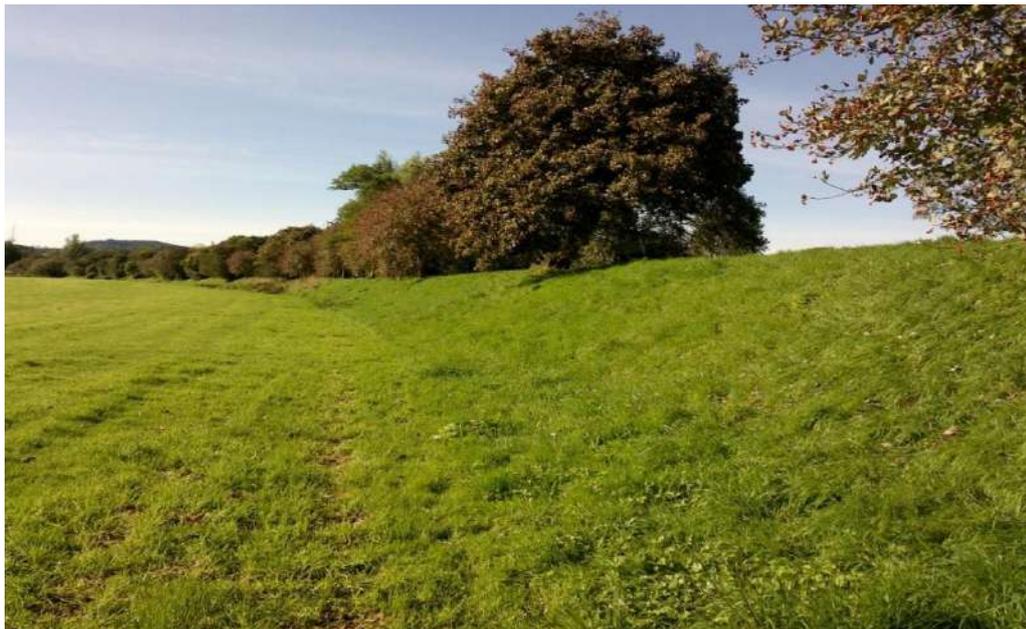


Plate 6.4: Dum008 (Embankment)

Dumfries (Dumf009)

This flood wall is located at a meander of the River Nith (NX977748). SEPA flood mapping indicates the medium likelihood flooding to extend landward of this defence. These defences are in good condition. It is assumed that this wall is not intended to provide flood protection but rather provide river bank stability by reducing erosion. It is presumed that these are council owned assets.



Plate 6.4: Dum009 (Flood Wall)

Dumfries (Dumf010-012)

These flood walls line the west Bank of the River Nith. SEPA flood mapping indicates that medium likelihood flooding does not extend landward of this defence and the area to the west of Dumfries is protected from coastal flooding. These defences are in fair condition and require maintenance. The topography increases steeply landwards and to the west of these defences. It is presumed that these are council owned assets.

Dumfries (Dumf013) Dockhead

This wall is located upstream of the A756 bridge and protects an area on the east bank of the River Nith. SEPA flood extents indicate that medium likelihood flooding does not extend landward of this defence. The Dockhead area of Dumfries is located landward of these defences. This wall is in good condition. The 2002 Coastal Protection Inventory referred to these defences as part of the Whitesands Seawall. These coastal defences are the property of the Council.



Plate 6.5 a. Dumf11 (Wall) & b. Dumf13 (Promenade)

**Dumfries (Dumf014-015) (Whitesands)**

Downstream of Dumfries Old Bridge and along the east bank of the River Nith is the Whitesands area of Dumfries. The 2002 Coastal Protection Inventory referred to these defences as part of the Whitesands Seawall. These coastal defences are the property of the Council. SEPA flood mapping indicates medium likelihood coastal flooding to extend landward of these defences. There is a major Flood Protection Scheme proposed for Dumfries (the Whitesands Project) which has been confirmed following publication with construction anticipated to take place in 2022.

Refer to [www.dumgal.gov.uk/article/16525/Whitesands-project-latest-position](http://www.dumgal.gov.uk/article/16525/Whitesands-project-latest-position) for further information.

**Dumfries (Dumf016-018)**

These walls are located close to the Old Bridge and just upstream of the A780 Bridge, where they fringe the bank of the River Nith. SEPA flood mapping indicates medium likelihood coastal flooding does not extend landward of these defences, indicating that the area to the north of Whitesands is protected. These defences are in fair condition. The defences located to the south (refer to previous section) are breached during a medium likelihood flood event.



Plate 6.6: Dumf016 (Flood Wall)

Dumfries (Dumf019-022)

This wall fringes the River Nith and is located adjacent to Mill Road. SEPA flood mapping indicates that medium likelihood coastal flooding does not extend landward of these defences, protecting the Mill Road from flooding. The topography increases steeply landwards and to the west of these defences. These defences are rated fair to poor. It is presumed that these are council owned assets.



Plate 6.7 Dumf020 (Flood Wall)

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### Dumfries (Dumf023-024) Mill Green End

This bank level wall was probably constructed to prevent erosion of the river bank. The 2002 Coastal Protection Inventory referred to these defences as part of the Whitesands (Mill Green End) Seawall. These coastal defences are the property of the Council. SEPA flood mapping indicates medium likelihood coastal flooding to extend landward of these defences, with an area of parkland inundated by flooding during a medium likelihood flood event, there are no receptors at flood risk here. These defences are in a fair condition.

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✔	?	?	✔	Progress a Hold the Line policy, subject to this being economic justified. Potential impacts identified for natural coastal / estuarine processes
Managed Realignment	✔	✔	?	?	Progress a Managed Realignment policy, potential environment & heritage and social impacts identified.
No Active Intervention	✔	✔	✔	?	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood risk management measures.

✘ - Reject  
 ✔ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 stated a policy of Hold the Line for this area to allow the coastal risks to communities and amenities in Dumfries and Glencaple, to be managed by maintaining the existing defences through proactive maintenance.

With climate change there may be a need to improve or provide additional defences in the future. The proposed Whitesands scheme is an example of this and while other coastal defences are in reasonable condition and so in the short term can be sustained through undertaking maintenance works within the existing defence footprints, there may be a need to improve and extend these in the future. The need for improvement should be informed by continued monitoring and reassessment of defences going forward.

Future detailed option appraisal will be required to assess the technical, economic and environmental viability of management approaches. If new defences are required in the future, these could impact important habitats and hence there may be a need to compensate for loss and damage to the areas through habitat creation elsewhere. New defences at Glencaple could have potential for impacts on designated habitats within the Internationally designated sites Upper Solway Flats and Marshes SPA, Ramsar and SSSI, and the Solway Firth SAC.

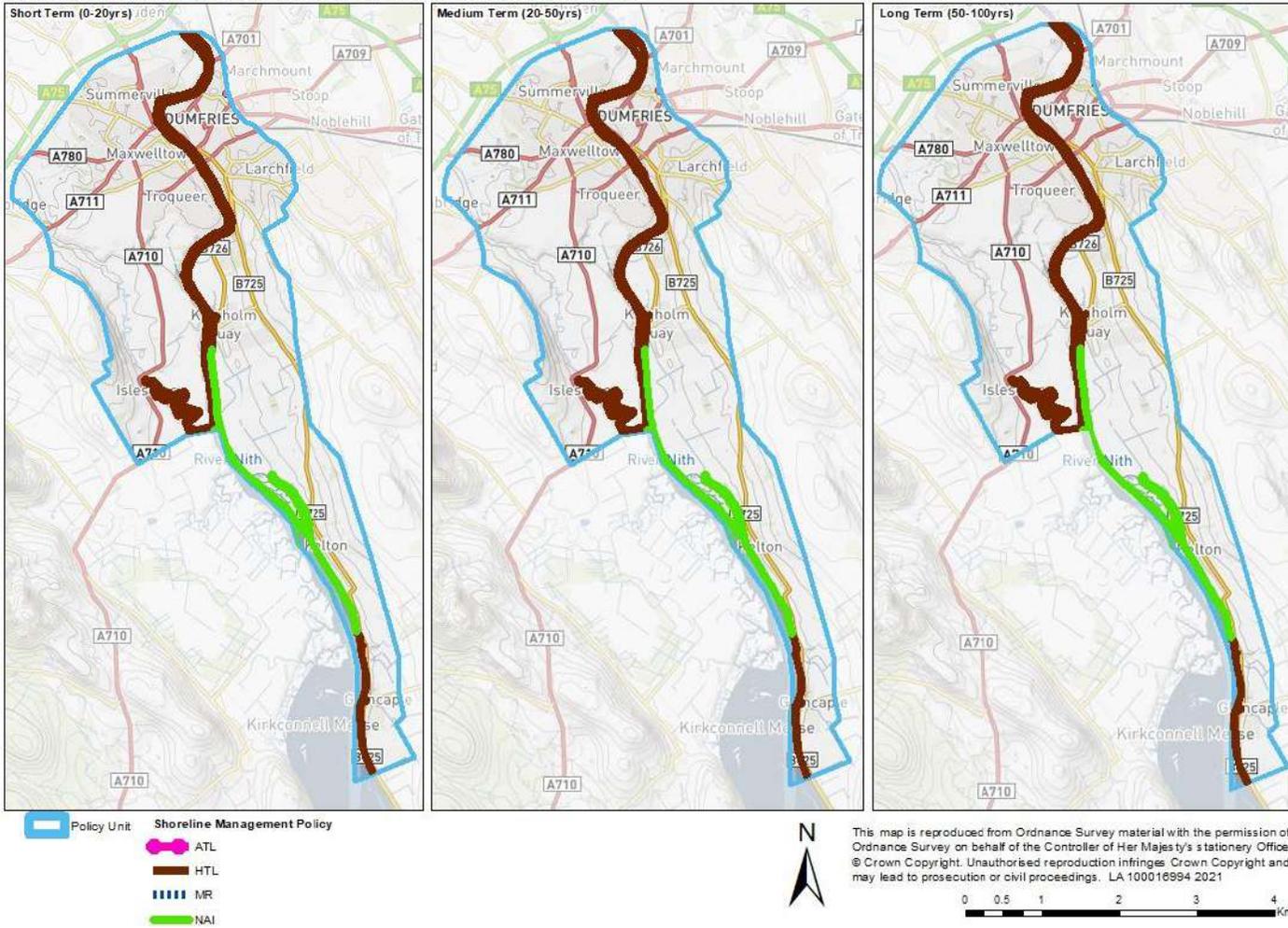
Managed Realignment should be considered as a policy in the longer term, as a Hold the Line policy may become unsustainable in the future. Managed Realignment has potential to lead to social impacts relating to the loss of properties.

## APPENDIX D – POLICY STATEMENTS

No Active Intervention should be applied to areas beyond those where there is no need to maintain existing flood risk management measures.			
<b>SELECTION OF POLICY</b>			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	C
Managed Realignment	x	A	A
No Active Intervention	C*	C*	C*
x - Reject C - Consider A - Alternative * - Localised			
<b>SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY</b>			
<p>The preferred strategic approach for PU 6 is to Hold the Line in most areas across all epochs, although further studies are needed to decide upon the most suitable option to deliver this policy. A whole catchment approach which takes into account proposals for other frontages within the estuary and considers the need for habitat creation to compensate for any direct losses should be adopted.</p> <p>Managed Realignment should also be considered as an alternative policy over the medium to long term, particularly as Hold the Line options are likely to become increasingly unsustainable. The continued monitoring of the coastline within PU 6 is therefore recommended, subject to availability of funding and resources to inform any potential transition from Hold the Line to Managed Realignment.</p> <p>No Active Intervention should be applied to those areas that are not presently defended and that do not require any flood or erosion risk management, over all epochs.</p> <p>The preferred policy of Hold the Line should be applied to the majority of the coastal extent of PU 6 and across all epochs, as shown in Figure 6.2</p> <p>The preferred policy of Hold the Line should be continued for as long as it is sustainable where coastal flood receptors have been identified. An alternative policy of Managed Realignment should be considered over the medium and long term if Hold the Line becomes unsustainable. The Managed Realignment of the B725 should be investigated further. Where private coastal defences already exist, these should be maintained, subject to consent being obtained. No Active Intervention applies to areas that are not presently defended and that do not require intervention.</p>			
<b>POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS</b>			
During public and stakeholder engagement, undertaken through March and April 2021, NatureScot representatives requested that Figure 6.2 was refined to show the spatial extent of Hold the Line, and Active Intervention policies.			
<b>STAKEHOLDER ENGAGEMENT OUTCOME</b>			
The 'Preferred Policy' of Hold the Line, with an alternative policy of Managed Realignment considered, over the medium and long term was not changed. However, clarification was added on the application of No Active Intervention, to sections of the coast where there are no existing defences and flood or erosion risk management is not required. Figure 6.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 6.			

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 6.2 Policy Unit 6 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D2.7 PU 7 – Drum Mains to Southernness

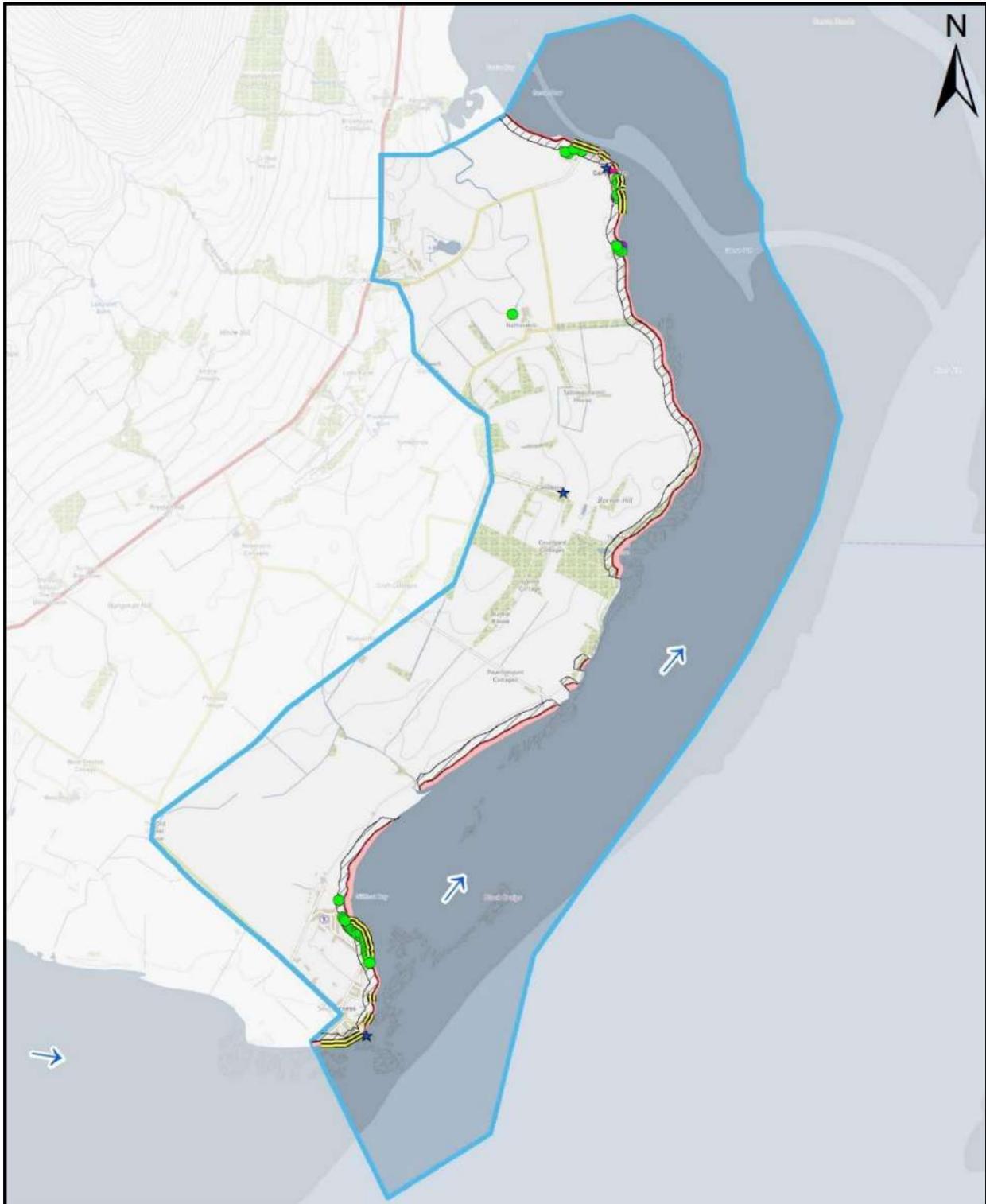


Figure 7.1 Policy Unit 7 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT
<p>PU 7 includes the section of the Dumfries &amp; Galloway shoreline extending from Drum-Mains (NX979597) in the north to Southernness Point (NX975543) in the south including the hamlet of Carsethorn. PU 7 is included within CPU 1, the dynamic inner section of the Solway Firth. The shoreline is generally composed of soft (erodible) material, although Southernness Point is described as a hard and mixed shoreline on account of it being fronted by a rocky shore platform. The SSS (Saltmarsh Survey of Scotland) identified an area of swamp, shingle and coastal dune at Gillfoot Bay to the north of Southernness Point. Carsethorn and Southernness are the main settlements located within PU 7. The surrounding hinterland is fairly level and relatively low-lying.</p> <p>The shoreline of PU 7 is designated as part of the Upper Solway Flats and Marshes SPA, Ramsar and SSSI, and Solway Firth SAC. The northern half of PU 7, extending from Drum-Mains to just south of Arbigland, is also designated as a National Scenic Area, the Nith Estuary. There is also an endangered species, the Natterjack Toad (<i>Epidalea calamita</i>), found throughout this area.</p> <p>Wave overtopping has been reported as an issue affecting erosion and flooding within PU 7.</p> <p>SEPA has designated Carsethorn and Southernness as Objective Target Areas, where objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. It also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.</p>
FLOOD RISK
<p>Based on SEPA strategic flood mapping data there are 37 homes and four business premises presently at a medium likelihood coastal flood risk. This is likely to increase to 58 homes and eight business premises by 2080 due to climate change. In addition, 1km of mainly local streets and minor road are at risk of flooding, increasing to 2km, when the anticipated impacts of climate change are considered.</p> <p>17 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 51% of the affected area is Arable and Horticulture. Due to climate change this will increase to 22 hectares. The annual average damage associated with coastal flooding is £125,357.</p> <p>There is one utility identified to at medium likelihood coastal flood risk, a Scottish Water facility located at Carsethorn.</p> <p>There are three cultural heritage features at a medium likelihood coastal flood risk, these include listed buildings located within Carsethorn and Southernness (lighthouse). The Garden and Designated Landscape at Arbigland is also at risk. Cultural heritage features at coastal flood risk are expected to increase to seven by 2080 due to climate change, with additional listed buildings affected in Carsethorn.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>

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Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	37	58
Business Premises	4	8
Utilities	1	1
Community facilities	0	0
Cultural Heritage	3	7
Transport roads (km)	1	2
Transport rail (km)	0	0
Agricultural Land (ha)	17	22

### Summary of Coastal Flood Risk in PU 7

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

The shoreline of PU 7 is at risk of coastal erosion although there are also some areas of accretion. Dynamic Coast estimates that by 2030 the shoreline of PU 7 will have advanced seawards by up to 7m at some locations, whilst receding landwards by up to 20m along other sections. By 2050, this shoreline is anticipated to be increasingly erosional and by 2080 it will be dominated by erosion.

A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 7 is tabulated below.

By 2050, there will be 11 homes and two businesses located within the Erosional Area and nine homes and businesses, as well as 0.16km of road will be situated within the Erosion Influence zone. 92 homes and 34 businesses are expected to be included within the Erosion Vicinity. Dynamic Coast has also estimated that by 2050, Scottish Water facilities including 1km of the clean water network and 0.4km of gravity pipes will be situated within the Erosion Vicinity, as well as 1.08km<sup>2</sup> Area of scheduled monument, McCulloch's Castle at Arbigland.

By 2100 it is anticipated that 41 homes and eight businesses will be located within the Erosional Area along with 0.4km of road, while 21 homes, two businesses and 0.34km of road will be within the Erosion Influence Zone and 91 homes and 10 businesses within the Erosion Vicinity. This apparent future decrease of assets located within the Erosion Vicinity does not signify mitigation, but rather that assets are now located within the Erosion Influence zone as the shoreline recedes. By 2100, Scottish Water assets including 0.5km of the clean water network and 0.08km of gravity pipes will be situated within the Erosional Area.

The Erosional Area is a zone where it is anticipated that the shoreline will recede, and assets will be directly impacted by coastal erosion. The Erosion Influence is a 10m buffer zone beyond the Erosional Area where assets are still considered to be at risk. Assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning.

The Carse Bay to Southernness Core path, accessible at low tide is also at erosion risk.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
11	9	92	2	3	34	0	0.16	1.1
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
41	21	91	8	2	10	0.4	0.34	1.2
<b>Summary of Coastal Erosion Risk in PU 7</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
<p>Refer to <a href="http://dynamiccoast.com/">http://dynamiccoast.com/</a> for further details relating to the Dynamic Coast erosion information.</p>								
<b>EXISTING COASTAL DEFENCE</b>								
<p>There are some coastal defences located within PU 7, mainly protecting homes and business premises located at Carsethorn and Southernness. These take the form of several groynes and rock armour at Carsethorn and rock armour at Southernness. There are also privately owned and maintained defences located within this policy unit.</p> <p>Based on the SEPA flood mapping, the area landward of the Carsethorn formal and privately owned defences is inundated by medium likelihood coastal flooding. The Carsethorn groynes (Reference 4) are intended to capture sediment drift and reduce the rate of erosion, not prevent flooding.</p> <p>At Southernness, to the south of the settlement the spatial extent of medium likelihood coastal flooding is limited by the presence of formal defences (rock armour). To the north of the settlement, coastal flooding extends landwards of the privately maintained or informal defence.</p> <p>Wave overtopping and erosion are significant issues that face the communities located here.</p>								
<b>SUMMARY OF EXISTING COASTAL DEFENCE</b>								
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area			
Carsethorn North-East (Cars006)	Private	Rock Armour	3	Maintenance required	Homes, businesses & private road			
Carsethorn East (1) (Cars005)	Council (Roads)	Wall	4	Maintenance required	Homes, businesses			
Carsethorn South-East (Cars000)	Council	Rock armour	3	Maintenance required	Agricultural land			

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Carsethorn East (2) (Cars001-004)	Council (Roads)	Groynes	3-5	Maintenance required	Road & carpark
Southernness (South001)	Private	Rock armour	3	Maintenance required	Homes, businesses

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Carsethorn North (Cars006)**

A section of rock armour fringes the shoreline for approximately 165m at the Northern end of the village and separates a garden area from the shoreline (NX993594). This low level rock armour is probably intended to prevent erosion. The asset condition survey described this asset as eroded and maintenance is required. These privately owned defence assets are in fair condition.

**Carsethorn East (Cars005)**

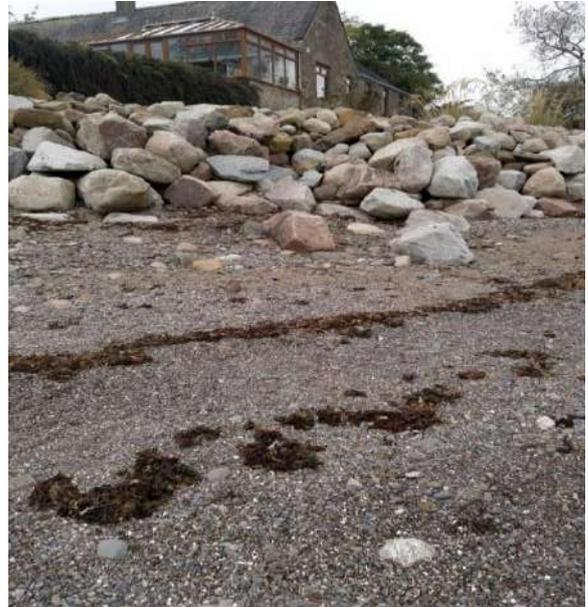
A section of rock armour, masonry and concrete wall located along the shoreline close to the bus turning area and carpark and seawards of the Old Hall. This asset is eroded and maintenance is required, it is in poor condition. These are Council (Roads) defence assets.



**Plate 7.1 a. Cars006 (Rock Armour) & b. Cars005 (Rock Armour) Overall View**

**Carsethorn East (Cars000)**

This section of rock armour is located to the south of 'The Barracks' and extends south. The rock armour has small voids and is in fair condition. The shoreline to the south of this defence fronts an area of farmland that is actively eroding. These are probably privately owned defence assets.



**Plate 7.2: Cars000 (Rock Armour)**

**Carsethorn East (Cars001-004)**

These four groyne are located along the foreshore and are constructed from railway sleepers. They are located along an 80m stretch of foreshore, between NX993596 and NX993597. These groyne are intended to capture sediment and reduce erosion and beach material has accumulated along the south face of each groyne indicating that these are trapping the northward drift of beach sediment. These defence assets are in fair to very poor condition. The 2002 Coastal Protection Inventory referred to these defences as the Carsethorn groyne, these features and the rock armour that lines the foreshore are referred to as being Council owned (Roads).



**Plate 7.3: a. Cars001 (Groyne) and b. Cars002 (Groyne)**

**APPENDIX D – POLICY STATEMENTS**

**Southernness (South001)**

This rock armour is located to the south-west of Southernness and is in fair condition. The presence of this defence benefits homes and businesses during a medium probability coastal flood event. The 2002 Coastal Protection Inventory referred to these as the Southernness Sea Wall, describing how numerous properties are located on sand dunes protected with rock armour and a stone wall. These are privately owned coastal defences.



**Plate 7.4: South001 (Rock Armour)**

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	?	?	?	✓	Progress a Hold the Line policy, subject to sufficient economic justification being achieved. Potential impacts identified for natural coastal / estuarine processes and technical issues.
Managed Realignment	✓	✓	✓	✓	Progress a Managed Realignment policy, potential social impacts identified.
No Active Intervention	✓	✓	✓	✓	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood / erosion risk management measures.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

## APPENDIX D – POLICY STATEMENTS

JUSTIFICATION FOR RETENTION / REJECTION			
<p>The SMP05 recommended a Hold the Line policy, to protect the communities located at Carsethorn and Southernness over all epochs. By continuing a Hold the Line policy over the short to medium term for PU 7 the coastal risks to communities and amenities in Carsethorn and Southernness, can be managed by maintaining the existing defences through proactive maintenance for as long as that remains feasible.</p> <p>Exceptional wave heights and wave overtopping impacted Carsethorn and Southernness during January 2014 and with climate change related sea level rise it is likely that this will become more common, therefore it is likely that a Hold the Line policy could become ineffective and impractical over the longer term. Thus the situation will need to be monitored and reviewed to identify the risks related to defence failure and increased impacts to properties and amenities.</p> <p>In the longer term, Managed Realignment may be more sustainable than options to continue to Hold the Line and could also help to achieve wider environmental objectives. Managed Realignment has potential to lead to social impacts relating to loss of properties. It is therefore recommended that Managed Realignment adaptation approaches are investigated further and considered for the future.</p> <p>No Active Intervention should apply to sections of the shoreline, where there is no need to maintain existing flood and /or erosion risk management measures.</p> <p>Future detailed option appraisal will be required to assess the technical, economic and environmental viability of different management approaches. If new defences are justified in the future, these could impact important habitats and hence may require compensatory habitat creation to offset loss and damage to the designated environmental areas within the Upper Solway Flats and Marshes SPA, Ramsar, and SSSI, or Solway Firth SAC. It is recommended that a wave overtopping study is undertaken to evaluate the risk associated with this flooding mechanism.</p>			
SELECTION OF POLICY			
Policy	Short-Term (0-20yr)	Medium-Term (20-50yr)	Long-Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	x
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C
<p>x - Reject            C – Consider            A – Alternative            *~ Applies to sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures.</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred strategic approach for PU 7 is Hold the Line, in defended areas by the proactive maintenance of existing defences in the short and medium term. This will allow time for further studies to be undertaken and the sustainability of this policy over the longer term to be fully assessed or alternatives developed. This is also commensurate with the local community plans to enhance the present range of private defences at Carsethorn. In the medium and longer term (beyond 20 years) it is likely to become increasingly difficult to retain effective defences and more substantial works would be required to fix the shoreline in its existing position. The added risk of more severe future wave overtopping also adds considerable uncertainty regarding the effectiveness of the existing defences. Furthermore, substantial changes to defences could impact upon important habitats within the Internationally designated sites situated along the shoreline of this policy unit.</p> <p>In the medium to longer term, the maintenance of defences may become unsustainable and as risk increases due to sea level rise, a move towards a policy of Managed Realignment is recommended. The short term preferred approach of Hold the Line will allow time for Managed Realignment adaptation planning to be put in place.</p>			

## APPENDIX D – POLICY STATEMENTS

No Active Intervention should be applied to sections of the undeveloped shoreline, where there are no existing flood and / or erosion risk management measures.

It is important to note that implementation of the recommended policies will necessitate activities that will be subject to availability of funding and resources.

The preferred policy of Hold the Line should be applied to the existing defended frontage PU 7 and across the short term and medium term. Over the long term the preferred policy of Managed Realignment should be applied, as shown in Figure 7.2. Where private informal defences already exist, these should be maintained, subject to consent being granted. Elsewhere, a policy of No Active Intervention should be adopted.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, NatureScot recommended that over the short and medium term a policy of No Active Intervention should be applied to undeveloped sections of the coast, with Hold the Line used locally for the settlements and the immediate frontage of certain other key assets, for the following reasons:

A Hold the Line policy for the whole of PU 7 could encourage new defences where there has been significant erosion in recent decades, e.g. Gillfoot Bay and Hogus Point. By reducing the input of eroded sediment to the coastal system, this could cause beach lowering at nearby existing defences and shortening their life. The new defences could also cause accelerated coastal retreat immediately adjacent ('bypass erosion', as seen between the defences at South Carse and Carsethorn). More generally, the longer-term move from Hold the Line to Managed Realignment would involve defences either being removed or failing, leading to more rapid erosion ('coastal catch-up') presenting urgent land management issues.

By adopting No Active Intervention where possible there will be reduced potential impacts on the SSSI / SAC / SPA habitat and species interests, including shingle.

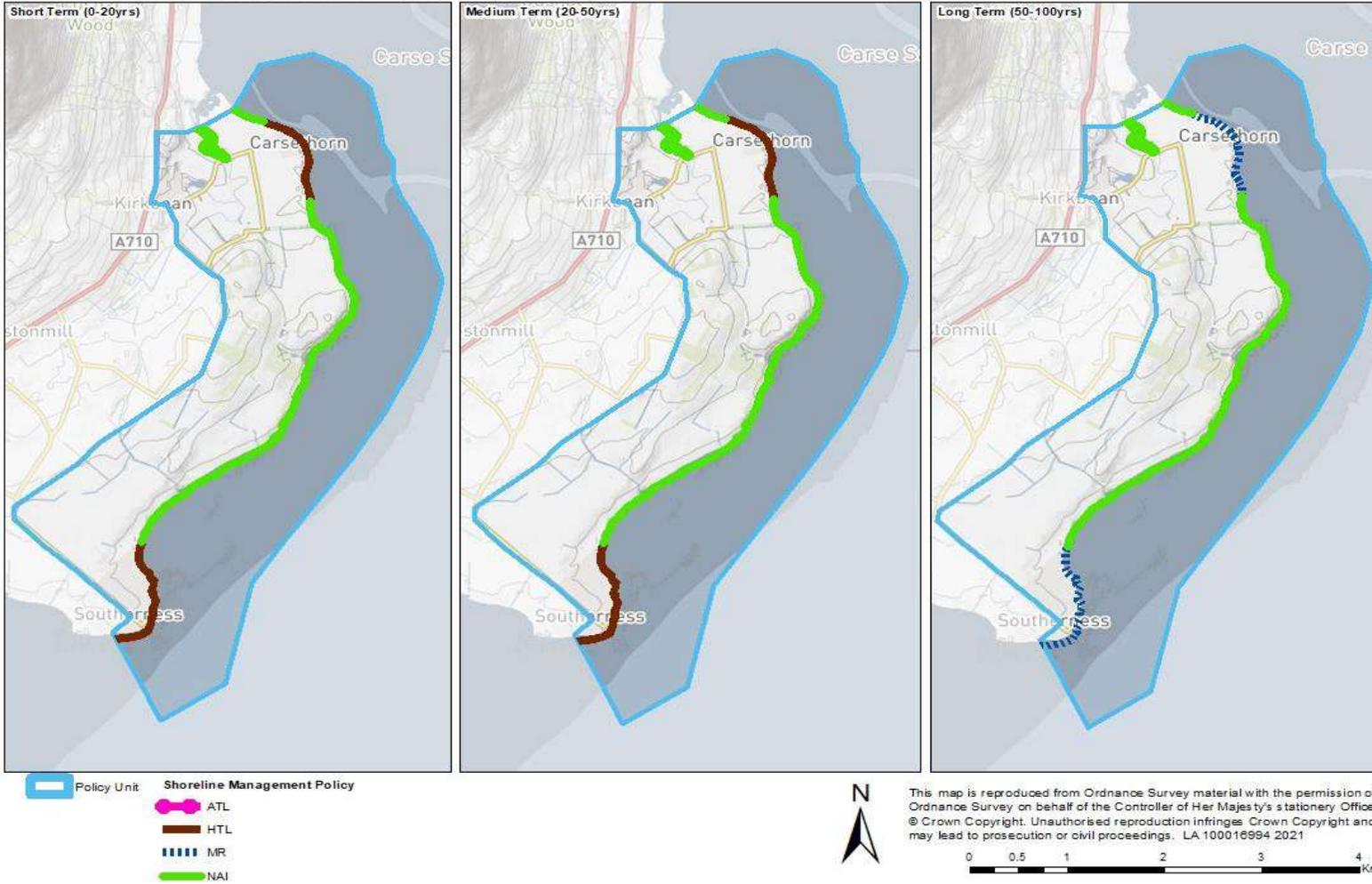
There will also be reduced potential impacts on the geological interest of the SSSI: this interest consists of foreshore rock exposures between South Carse and Powillimount and around all of Southernness Point. Although new defences would in most locations be installed at the top of a beach, in some locations they could obscure rock exposures, adversely impacting the SSSI.

### STAKEHOLDER ENGAGEMENT OUTCOME

The 'Preferred Policy' of Hold the Line over the short and medium term remains although only for the existing defended areas or the immediate frontage of key assets. A policy of Managed Realignment remains for the long term. A refinement of the Preferred Policy for PU 7 included clarification of No Active Intervention being applied to sections of the shoreline, where there is no need to maintain coastal flood and erosion management measures. Figure 7.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 7.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

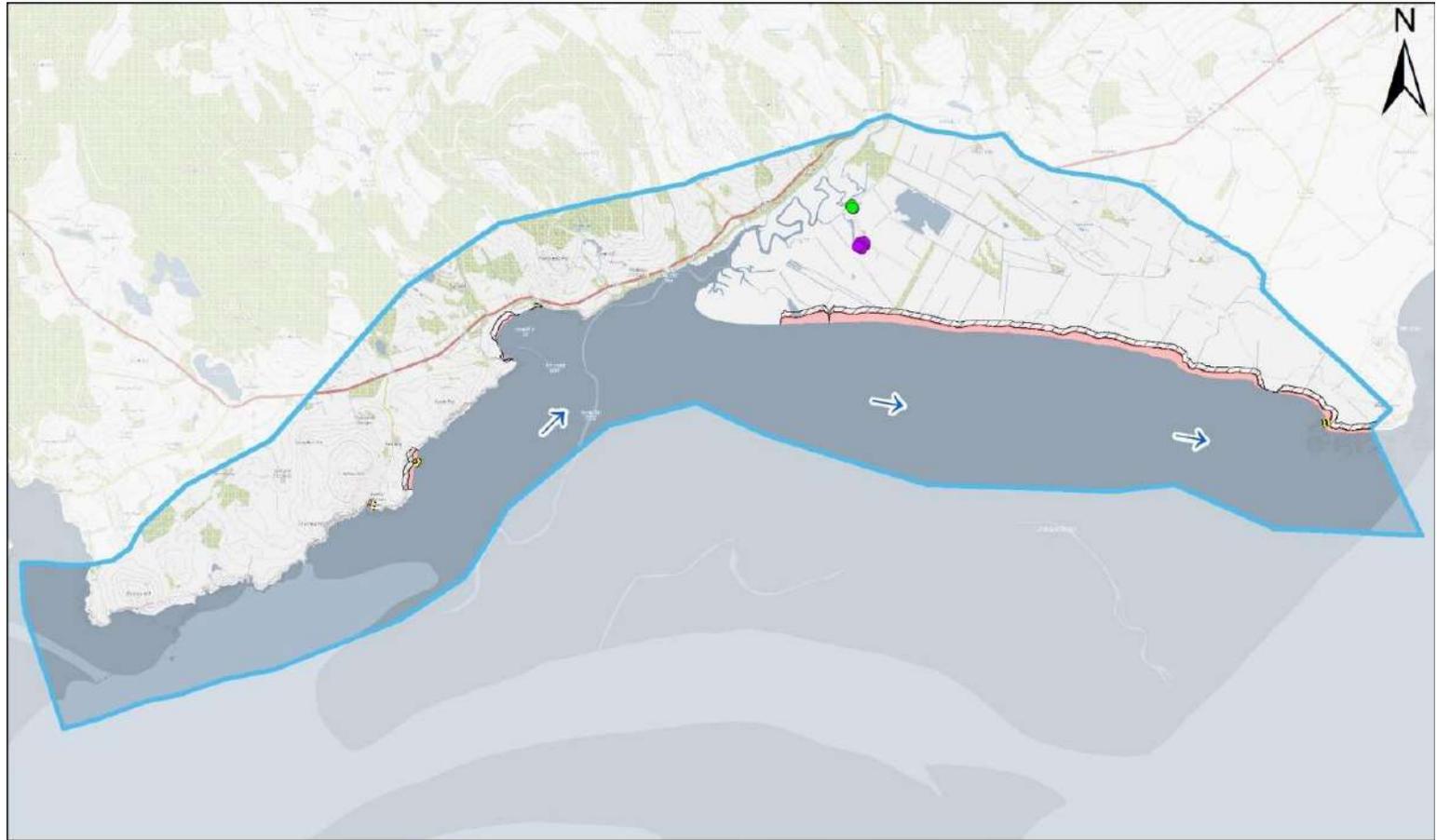
Figure 7.2 Policy Unit 7 Geographical Extent of Preferred Policy (0-100yr) All Epochs



### 3 COASTAL PROCESS UNIT 2

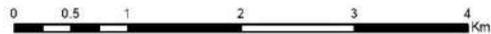
CPU 2 of the Dumfries & Galloway SMP, the Outer Solway Firth, extends from Southernness Point in the east to Torrs Point in the west, including the tidal reaches of the Urr Water and Dalbeattie Burn. CPU 2 includes four policy units for which the relevant management policies are identified in the following sub-sections.

D3.1 PU 8 – Southerness to Castlehill Point



**Figure 8.1 Policy Unit 8 Coastal Flood and Erosion Risk**

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- |                          |                            |                                      |
|--------------------------|----------------------------|--------------------------------------|
| Policy Unit              | Residential Properties     | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Non-Residential Properties |                                      |
| Defence Asset            | Utilities                  |                                      |
| Sediment Drift Direction |                            | Erosion                              |
|                          |                            | Erosion Influence                    |
|                          |                            | Erosion Vicinity                     |

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 8 covers the coastline from Southernness Point (NX975543) in the east to Castlehill Point (NX847523) in the west and includes approximately 16km of shoreline within CPU 2, the Outer Solway. The shoreline is mainly composed of soft sediments (erodible) from Southernness to Mersehead and the Southwick Burn. West of the Southwick Burn the shoreline is described as hard and mixed, and with the exception of Sandhills Bay that is predominately composed of soft sediment, the shoreline continues to be hard and mixed to Castlehill Point. At low tide an extensive area of intertidal sand referred to as 'Mersehead Sands' is exposed and the channel of the Southwick Burn / Water is incised through these intertidal sands. The landward part of the Southwick Burn meanders through an area of saltmarsh habitat at Mersehead. At this location, the SSS (Saltmarsh Survey of Scotland) has also identified areas of coastal sand dune, mire and swamp. This area is currently managed by the RSPB. An endangered species, the Natterjack toad (<i>Epidalea calamita</i>) is also found at the Mersehead coastal sand dunes. The west of PU 8 includes Southwick coastal nature reserve, an area managed by The Scottish Wildlife Trust.</p> <p>The main settlements located within PU 8 are Sandyhills and Portling, although there are several other hamlets and large farms located within this policy unit.</p> <p>There are environmentally designated sites within PU 8. The shoreline between Southernness Point and just west of Craigneuk Point is designated as the Upper Solway Flats and Marshes SPA, Ramsar and SSSI, and Solway Firth SAC. Port O'Warren Bay is also designated as a SSSI.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data there are three homes and eight business premises presently at a medium likelihood of coastal flood risk. This is likely to increase to four homes and eight business premises affected by 2080 due to climate change. In addition, 1.4km of road mainly local street and minor road are at risk of flooding, increasing to 1.8km, when the anticipated impacts of climate change are considered.</p> <p>163 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 46% of the affected area is Arable and Horticulture. Due to climate change this will increase to 204 hectares. The annual average damage associated with coastal flooding is £74,173.</p> <p>There are no utilities, community facilities or cultural heritage features identified to be at flood risk within this area.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	3	4
Business Premises	8	8
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	1.4	1.8
Transport rail (km)	0	0
Agricultural Land (ha)	163	204
<b>Summary of Coastal Flood Risk in PU 8</b>		

## APPENDIX D – POLICY STATEMENTS

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

The shoreline of PU 8 is at risk of coastal erosion, although there are areas of accretion as well as erosion. Small areas of sediment accretion occur in the west of PU 8 and are confined to the small bay areas including Sandyhills Bay (NX894551) and Portling Bay (NX883539). Dynamic Coast estimates that by 2030 the shoreline of PU 8 will have advanced seawards by up to 13m at some locations, whilst receding landwards by up to 30m in others. The shoreline to the east of the Southwick Water that mainly comprises of softer sediment will be impacted the most by erosion. By 2100 erosion in this area is anticipated to have caused the shoreline to recede by up to -39m.

Due to uncertainty as to how areas of salt marsh will respond to sea level rise, Dynamic Coast does not present erosion predictions for such areas. This is particularly significant at Mersehead where there is extensive saltmarsh and no erosion is shown, however it should not be presumed that these areas will not be impacted by erosion.

The erosion risk to PU 8 as depicted by Dynamic Coast data is tabulated below. By 2050, it is estimated that one business will be located within the zone of Erosion Influence, whilst four homes, one further business as well as 0.01km of road will be located within the Erosion Vicinity. Other assets including Green Space (82ha) and part of a Golf Course (87ha) will be located within the Erosion Vicinity. Some Scottish Water assets will also be located within the Erosion Vicinity, including 0.3km of the clean water network, while designated environmental sites including SAC (308ha), SPA (312ha) and SSSI (308ha) are situated within the Erosion Influence zone.

By 2100, there will be one business located within the Erosional Area, with one home located within the Erosion Influence zone, and five homes, one further business and 0.79km of road located within the Erosion Vicinity. In addition the Erosional Area will include Green Space (202ha), Golf Course (202ha), 1.1km of the clean water network, as well as designated environmental sites including SAC (899ha), SPA (911ha) and SSSI (899ha).

Assets within both Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.

The Mersehead to Southernness Core Path is also at erosion-risk, mainly the section of path at the RSPB Mersehead Reserve (about 3km).

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	4	0	1	1	0	0	0.11
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	1	5	1	0	1	0	0	0.79
<b>Summary of Coastal Erosion Risk in PU 8</b>								

## APPENDIX D – POLICY STATEMENTS

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

### EXISTING COASTAL DEFENCE

There is a small area of formal coastal defence located within PU 8, this is a masonry wall located at Port O'Warren.

There are also private coastal defences identified throughout this area, including rock armour that fringes the shoreline at Southernness Golf Course (NX969543). There are also areas of raised earthen embankment located along the seaward boundary of some agricultural land, particularly the low-lying land located to the east of the Southwick Burn. With the exception of the formal defence located at Port O'Warren, there are no further defences located to the west of the Southwick Burn. There is a private defence located at Rockcliffe (NX852527) which protects a private road leading to Castlehill Point. The table below summarises the existing formal defence based upon a flood asset survey database.

### SUMMARY OF COASTAL EXISTING DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Port O'Warren (PWarren)	Private	Wall	2	None	Residential property
Portling Bay	Private	Wall	-	-	-
Southernness Golf Course	Private	Embankment	-	-	-

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

#### [Port O'Warren \(PWarren\)](#)

This section of wall fringes the shoreline at Port O'Warren (NX879535). The asset condition survey scored this asset with a condition grade of 2 (Good). Based on SEPA flood mapping, the medium likelihood coastal flood extent does not inundate the area landwards of this formal defence. The 2002 Coastal Protection Inventory referred to these defences the Portling Seawall, this is a privately owned coastal defence.

**APPENDIX D – POLICY STATEMENTS**



**Plate 8.1: PWarren (Wall)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✘				No requirement to Hold the Line in this policy unit.
Managed Realignment	✘				No requirement for Managed Realignment of existing defences in this policy unit.
No Active Intervention	✔	✔	✔	?	Progress a No Active Intervention policy. Potential social impacts identified.

✘ - Reject  
 ✔ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

SMP05 recommended No Active Intervention for most of this policy unit, with Limited Intervention at Sandyhills Bay. The continuation of this approach will support the environmental designations for this Policy unit, although consideration should be given to permitting landowners to maintain informal or private defences where appropriate and subject to consent. Any modification to or replacement of existing structures, particularly hard engineering solutions (rock armour) may require consent from NatureScot, due to the importance of habitats in the intertidal zone. The formal defence located at Port O'Warren is currently in a good state of repair but may require some maintenance in the future.

## APPENDIX D – POLICY STATEMENTS

If No Active Intervention is progressed, this will allow the shoreline in the eastern part of this policy unit to continue to evolve naturally. Traditional agricultural practices, such as the grazing of the merse should continue.

At Sandyhills Bay there is a section of road (A710) that is projected to be at risk of erosion in the future. Monitoring is required to assess the potential future erosion risk to the A710 at Sandyhills, however works should only be implemented if the road is established to be at risk. Managed realignment was not considered for this section of road, due to the restrictive nature of the steep topography.

### SELECTION OF POLICY

Policy	Short-Term (0-20yr)	Medium-Term (20-50yr)	Long-Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	x
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \* Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 8 is No Active Intervention, although maintenance of private defences within their current footprint would remain appropriate. Any modification of defences, particularly along Southernness Golf Course would require consent by NatureScot.

This policy will allow the shoreline to evolve naturally but may need to be reviewed to allow for maintenance of the A710 when required. The continued maintenance of the coastal defence at Port O'Warren should also be continued for as long as it is sustainable.

Recommended activities are subject to funding and resources available to take them forward. If schemes are required, as might be the case with the potential repair of the A710, this will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 8 and across all epochs, as shown in Figure 8.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, NatureScot advised that the 'extension' of local defences would contradict the No Active Intervention policy.

A questionnaire return received during the public consultation period, 'agreed' with the 'Preferred Policy' for PU 8. It was also noted that there was no mention of any impact on Portling Beach and properties that are located at tide level and have experience flooding.

STAKEHOLDER ENGAGEMENT OUTCOME

The responses received during the stakeholder engagement period did not suggest any change to the 'Preferred Policy' of No Active Intervention with maintenance of existing defences applied across PU 8 and for all epochs. However, it was noted that the modification of any defences along this shoreline, will require consent by NatureScot. Figure 8.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 8.

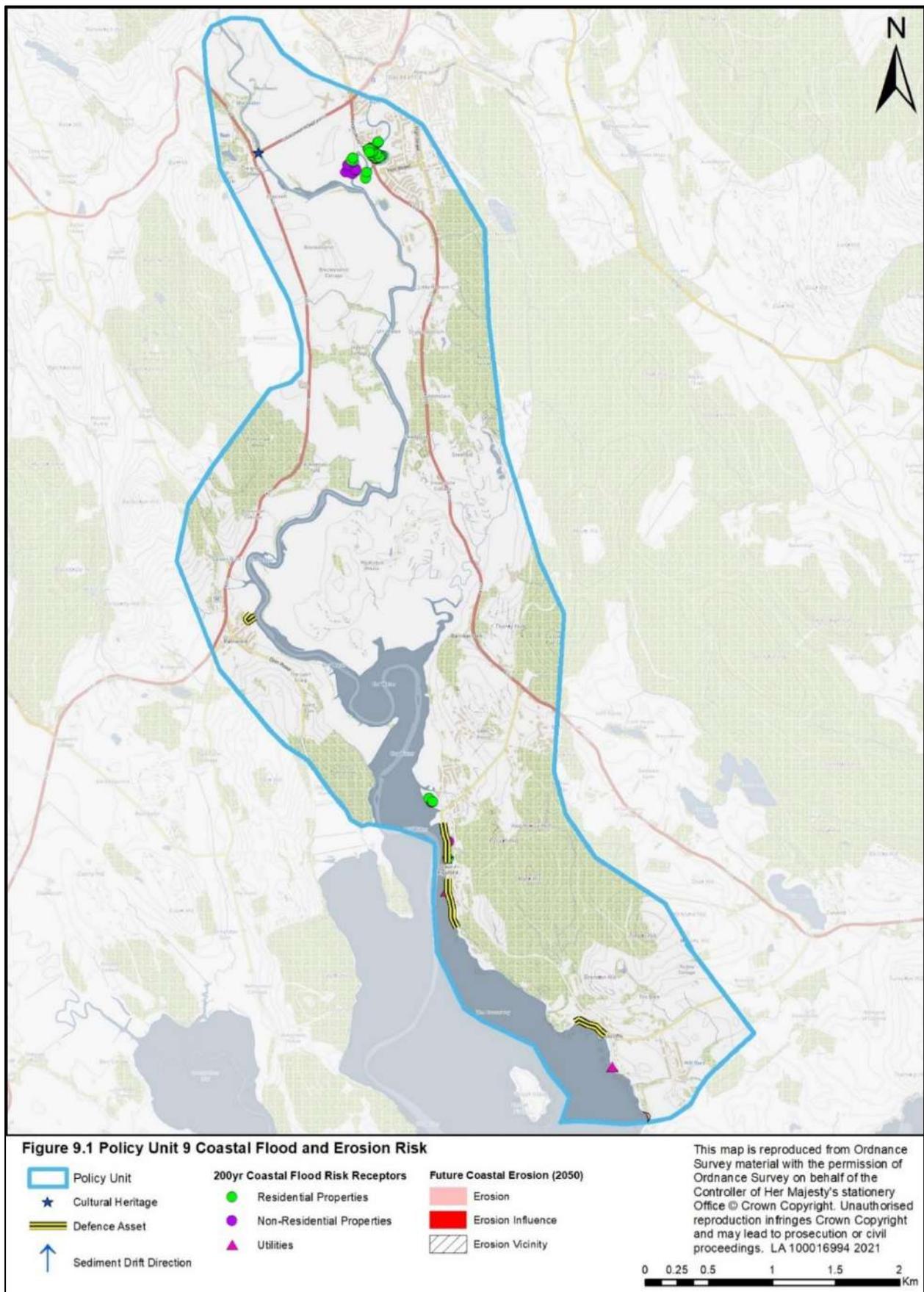
GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 8.2 Policy Unit 8 Geographical Extent of Preferred Policy (0-100yr) All Epochs



 Policy Unit	<b>Shoreline Management Policy</b>	 	This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. LA 100016994 2021
 ATL	 HTL		
 MR	 NAI		

D3.2 PU 9 – Castlehill Point to Dalbeattie



## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 9 covers the tidally affected reaches of the Urr Water and Dalbeattie Burn as they flow south towards the Rough Firth and is part of CPU 2, the Outer Solway Firth. At low tide muddy river banks are exposed, with areas of saltmarsh habitat located towards the downstream extent of the Urr Water and within the Rough Firth. The spatial extent of this policy unit extends from West Barcloy in the south (NX854529) northwards towards the tidal extent of Urr Water, close to Buittle Castle (NX819616).

The town of Dalbeattie is the main settlement within PU 9, other settlements include the villages of Rockcliffe, Kippford and Palnackie. Dalbeattie is located inland of the Solway Firth on the banks of the tidal Kirkgunzeon Lane which is connected to the tidally influenced Urr Water. High coastal water levels within the Solway Firth can interact with river flows at this location.

SEPA has designated Dalbeattie as an Objective Target Area (OTA). This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

The lands adjacent to the Urr Water are relatively flat and dominated by agriculture. PU 9 is within a National Scenic Area, the East Stewartry Coast, which extends upstream on the Urr Water to just north of Munches.

### FLOOD RISK

Based on SEPA strategic flood mapping data there are 38 homes and 11 business premises at a medium likelihood of coastal flood risk. This is likely to increase to 49 homes and 17 business premises by 2080 due to climate change. The Port areas of Dalbeattie, Kippford and Rockcliffe have been identified to be at risk of flooding. In addition, a total of 1.97km of road is also affected, including 0.3km of the A710 and sections of minor road. When the anticipated impacts of climate change are considered, 2.5km of road will be at coastal flood risk including 0.3km of the A710.

80 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 46% of the affected area is Arable and Horticulture. Due to climate change this will increase to 98 hectares. The annual average damage associated with coastal flooding is £344,818.

Two utilities are identified to be at flood risk, these are Scottish Water sites, located at Kippford and Rockcliff.

There are two cultural heritage features identified to be at medium likelihood coastal flood risk within this area, these are both Listed Buildings, located in Dalbeattie and Kippford.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change			
Homes	38	49			
Business Premises	11	17			
Utilities	2	2			
Community facilities	0	0			
Cultural Heritage	2	2			
Transport roads (km)	1.97	2.5			
Transport rail (km)	0	0			
Agricultural Land (ha)	80	98			
<b>Summary of Coastal Flood Risk in PU 9</b>					
Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.					
<b>EROSION RISK</b>					
The Dynamic Coast second phase data does not extend into PU 9, therefore no assessment of erosion risk has been possible.					
<b>EXISTING COASTAL DEFENCE</b>					
<p>There are existing formal coastal defence assets located at Palnackie (quay wall), Rockcliffe (rock armour revetment) and Kippford (walls), these are summarised below. SMP05 noted that defences are probably too fragmentary to have significant impact on estuarial processes, including siltation and meandering.</p> <p>No formal coastal defences are associated within Dalbeattie, the primary aim of the 1981 flood scheme was to mitigate river flooding. The Dalbeattie Flood Study (2016) provided a hydrometric and hydraulic assessment of the current standard of protection offered by the 1981 flood scheme and a detailed condition assessment of the scheme defences. This study also noted that the impact of high tidal levels extended upstream to Maxwell Street / Beech Grove, although the impact on flood levels and flood extents is relatively minor.</p> <p>There is a private defence located along the shoreline at Kippford, this is located south of KIPP001 (NX837544). This defence is described as a rock revetment that fringes the edge of a private road leading to the Mote of Mark.</p>					
<b>SUMMARY OF EXISTING COASTAL DEFENCE</b>					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Kippford South (Kipp001)	Private	Embankment	4	Continued monitoring and repair as necessary	Roughfirth Road (Private Road)

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Kippford North (Kipp002)	Council (Roads)	Masonry Wall	2	None	Public Road (Minor)
Rockcliffe South (Rock001)	Council (Roads)	Embankment (Rock Armour)	3	Continued maintenance	Public Road (Minor)
Rockcliffe North (Rock002)	Council (Roads)	Embankment (Rock Armour)	4	Continued maintenance	Public Road (Minor)
Palnackie Quay (Pan001)	Private	Quay	4	Continued maintenance	Palnackie harbour & local businesses

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Kippford South (Kipp001)**

This embankment reinforces about 0.39km of the seaward edge of the Roughfirth Road (private) in Kippford. The defence is best described as a reinforced embankment, consisting of boulders set in cement. The medium likelihood coastal flood extent is located landwards of this asset. There are mature trees growing along the crest in places and this asset is in poor condition therefore maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Kippford rock protection, protecting a public right of way to the Jubilee Path. It is also stated that these are private defences.



**Plate 9.1: Kipp001 (Embankment)**

[Kippford North \(Kipp002\)](#)

This masonry wall runs adjacent the seaward edge of public road in Kippford for approximately 0.32km. The medium likelihood flood extent is located landwards of this asset. There are some gaps in the crest of the wall to allow pedestrian access to the shore and a gap to allow access to a private slipway opposite Rosemount House. To improve the efficiency of this wall, these gaps would need to be raised or closed to provide a consistent elevation along the entirety of the wall. Flood gates should be considered, if continued access is required. This wall is in a good state of repair. The 2002 Coastal Protection Inventory referred to these defences as the Kippford Sea Wall and stated that these are Council owned (roads).



Plate 9.2: Kipp002 (Wall)

[Rockcliffe South \(Rock001\)](#)

This a 0.16km section of rock armour located along the seaward edge of a minor road that runs adjacent the shoreline at Rockcliffe. The shoreline is described as steep and the rock armour is well-packed. This defence is generally the southwards continuation of Rock002. The landwards extent of medium likelihood coastal flooding covers the road but is restricted by steep topography and robust private garden walls. This asset is in a fair condition, continued monitoring of this defence is recommended. The 2002 Coastal Protection Inventory referred to these defences as Rockcliffe Coastal Protection and stated that the defence assets are Council owned (roads).



**Plate 9.3: Rock001 (Rock Armour)**

**Rockcliffe North (Rock002)**

This defence is the northward continuation of Rock001 and is a 0.12km section of rock armour located along the seaward edge of a minor road running adjacent the shoreline at Rockcliffe. The landwards extent of medium likelihood coastal flooding covers the road, but is restricted by steep topography and robust private garden walls. The exposed face of the rock armour is collapsed in sections and it is covered in dense vegetation. The asset is in poor condition and repair of this defence asset is required. It is assumed that these are also Council owned assets.



**Plate 9.4: Rock002 (Rock Armour)**

**Palnackie Quay (Pan001)**

This is a 0.14km stretch of wall and timber breastwork that defines the seaward edge of Palnackie Quay, a working harbour located on the Urr Water that can be identified on historical OS maps of the area (1850 & 1894). The landward extent of medium likelihood coastal flooding extends into the harbour area to the north, but is restricted by the presence of a boundary wall. It is unclear if this wall is intended as a flood defence. The asset survey identified areas of erosion along the quay face and rotten timber. This

**APPENDIX D – POLICY STATEMENTS**

asset is in poor condition and repair of the stone wall is required as well as replacement of the rotten timber planking. The 2002 Coastal Protection Inventory stated that this is privately owned.



**Plate 9.5: PAN001 (Quay)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
<b>Advance the Line</b>	✘				No justification for Advance the Line in this policy unit.
<b>Hold the Line</b>	✔	?	?	✔	No significant issues anticipated. Economic viability could be marginal. Monitoring of environment and heritage features required.
<b>Managed Realignment</b>	✘				No opportunity identified for Managed Realignment in this policy unit.
<b>No Active Intervention</b>	✔	✔	✔	✔	Progress No Active Intervention policy. No potential impacts identified.

✘ - Reject  
 ✔ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

The SMP05 recommended Hold the Line for Dalbeattie (The Port), Rockcliffe and Kippford as a long term policy (>50years). 'No Active Intervention' was recommended for the remaining area.

## APPENDIX D – POLICY STATEMENTS

The continuation of the SMP05 preferred policies is recommended. Hold the Line should be continued by maintaining the formal coastal defences at Rockcliffe and Kippford, for as long as it is sustainable. The recommendations of the Asset Condition Survey should be implemented. It is recognised that these defences will become increasingly ineffective in the future, as the result of climate change. Coastal communities including Kippford and Rockcliffe will be required to prepare for increasing future flood risk. A Hold the Line policy can also be implemented at Palnackie Harbour.

The 1981 Dalbeattie Flood Protection Scheme was aimed at mitigating river flooding within Dalbeattie. The Dalbeattie Flood Risk Study (2016) considered the combined tidal and fluvial flood risk and concluded that the impact of an extreme tide on flood levels and flood extents is relatively minor. The most noticeable impact was identified near the Biggar's Mill Business Park and surrounding area. This recent Flood Risk Study has reviewed the SEPA flood extents and reduced the number of homes and business premises identified to be at medium likelihood coastal flood risk within Dalbeattie. This Flood Risk Study considered several options, with Property Level Protection (PLP) schemes being recommended, however it is suggested that further assessment is required.

Within PU 9, it has been identified that there is little opportunity for the expansion of coastal habitats at Kippford and Rockcliffe. The relatively steep landwards topography would restrict the expansion of coastal habitats at these particular locations. Similarly the realignment of the minor road along Kippford and Rockcliffe may be difficult due to lack of alternative routes and limited existing road infrastructure. For the remaining areas of PU 9 that do not require protection a policy of No Active Intervention should be implemented.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	x	x	x
No Active Intervention	C	C	C

x - Reject  
 C - Consider  
 A - Alternative  
 \*Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 9 is to continue to implement a localised Hold the Line policy for as long as it is technically and economically feasible to do so. In the short and medium term, works will be required to maintain and repair the existing defences. Over the long term, defences would need to be improved and it could be difficult to make an economic case for this. Recommendations provided in the Asset Condition assessment relating to the maintenance of the formal defences should be implemented. A policy of No Active Intervention should be applied to the remaining coastline.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions. Alternative funding should be sought for the maintenance of private roads and defences. The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 9 and across all epochs, as shown in Figure 9.2. A localised Hold the Line policy should be continued by maintaining formal coastal defences at Rockcliffe and Kippford, for as long as it is sustainable. At Palnackie Harbour, a Hold the Line policy can be implemented.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

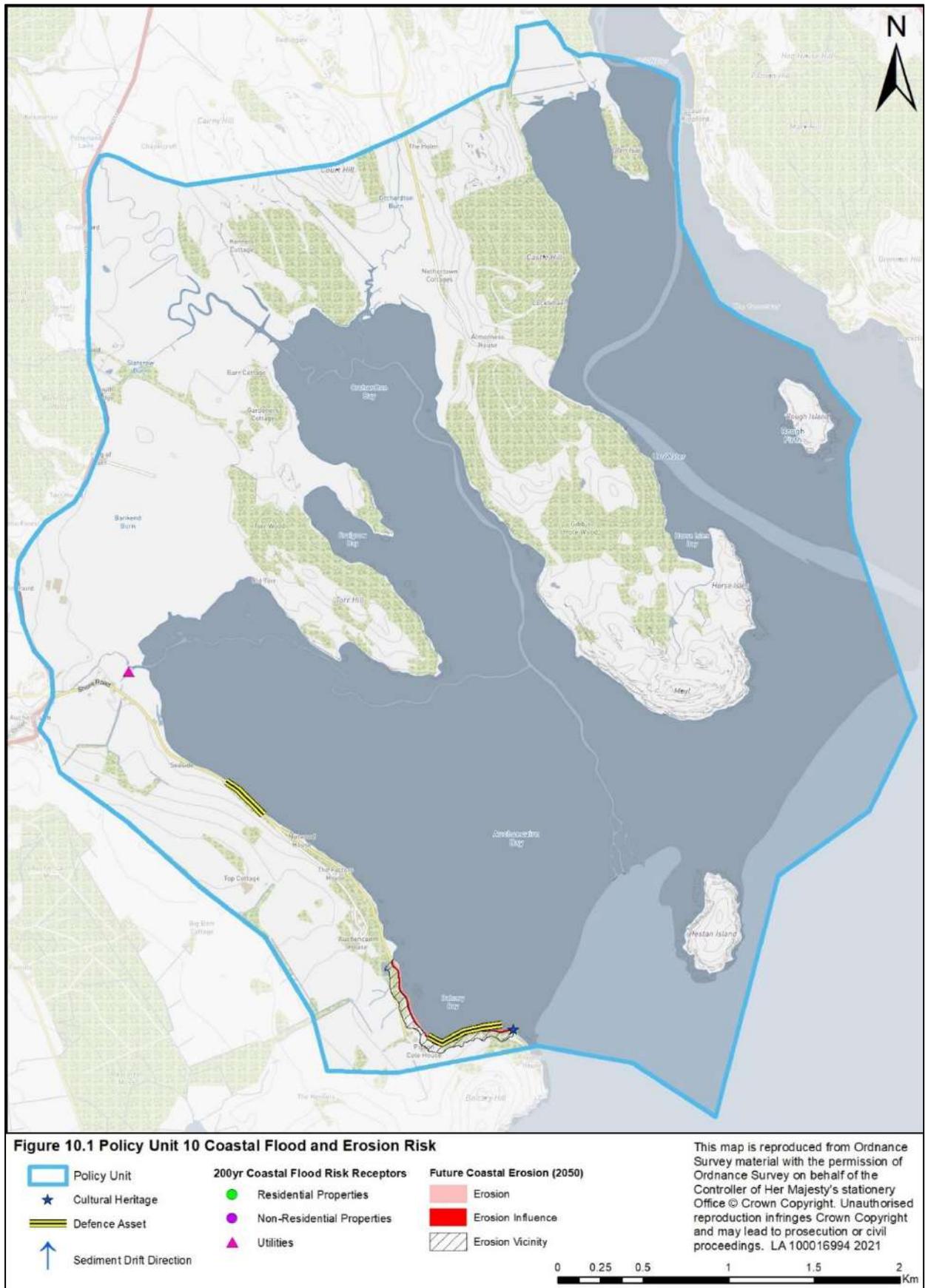
No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention with localised Hold the Line, as presented during the stakeholder engagement was not updated. Figure 9.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 9.



D3.3 PU 10 – Castlehill to Balcary Point



## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 10 includes the western shore of the Rough Firth and the shorelines of Orchard Bay, Auchencairn Bay and Balcary Bay and extends from north of Castlehill (NX828554) towards Balcary Point (NX827494). The shoreline of PU 10 is composed of a mix of soft sediment, hard and artificial areas. At low tide extensive areas of intertidal sand and mudflats are exposed while the head of each of the bays contains areas of salt marsh habitat. There are rocky islands and promontories and private slipways at Balcary Fishery. The Urr River, Orchardton Burn and Auchencairn Lane all discharge into the Solway Firth within this Policy unit which lies within CPU 2, the Outer Solway Firth.</p> <p>The area is mainly rural and the main settlement is the village of Auchencairn. The surrounding area is dominated by agriculture.</p> <p>There are environmentally designated sites within the policy unit. Auchencairn Bay and Orchard Bay are designated as SSSI's, while the entirety of the policy unit lies within the National Scenic Area of the East Stewartry Coast.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data there are no homes or business premises at a medium likelihood coastal flood risk. By 2080, even when the anticipated impacts of climate change are considered, no properties are predicted to be at a medium likelihood coastal flood risk. However, 0.4km length of minor road is presently at a medium likelihood coastal flood risk, increasing to 0.5km in the future. This includes the Shore Road that fringes a rocky platform and runs south towards Balcary Bay. There are also small lengths of private road with restricted access that are affected.</p> <p>87 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 57% of the affected area is Improved Grazing. Due to climate change this will increase to 107 hectares. The annual average damage associated with flooding is £45,271.</p> <p>There is one utility identified to be at flood risk, a Scottish Water facility located to the north of Auchencairn village at Craigshall.</p> <p>There is one cultural heritage feature, a Listed Building (Category C) Balcary Tower (NX826495) that is at flood risk.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	1	1
Community facilities	0	0
Cultural Heritage	1	1
Transport roads (km)	0.4	0.5
Transport rail (km)	0	0
Agricultural Land (ha)	87	107
<b>Summary of Coastal Flood Risk in PU 10</b>		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		

**APPENDIX D – POLICY STATEMENTS**

**EROSION RISK**

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

Within PU 10 the risk from coastal erosion is restricted to the west of the policy unit, particularly the shoreline of Balcary Bay. By 2030, Dynamic Coast estimates that parts the shoreline of PU 10 will have receded by up to 6m, with the north-west corner of Balcary Bay receding at the fastest rate. By 2100, it is estimated that sections of this shoreline may recede by up to 12m.

The erosion risk within PU 10 is tabulated below and shows that one home and one business will be located within the zone of Erosion Vicinity by 2050, whilst a small section (0.03km) of minor road is located within the Erosional Area. By 2100, there will be one home, one business as well as 0.11km of road located within the Erosional Area, along with some Scottish Water assets, including 0.23km of the clean water network. A further 0.8km of Scottish Water asset will be located within the Erosion Influence zone. Assets within both the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	1	0	0	1	0.03	0.03	0.22
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
1	0	0	1	0	1	0.11	0.05	0.29

**Summary of Coastal Erosion Risk in PU 10**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

**EXISTING COASTAL DEFENCE**

There are coastal defences located along the Shore Road, at Auchencairn Bay and at Balcary Bay. These include walls and a rock revetment that separate the foreshore from the road, located along the western shoreline of Auchencairn Bay, and along the seaward edge of the Balcary Bay Country House Hotel, The Tower and other private dwellings. With the exception of section at 'The Tower', the medium likelihood coastal flood extent does not extend landwards of these defences, benefitting private property, the hotel and sections of the Shore Road. Coastal defences located within PU 10 are summarised overleaf.

**APPENDIX D – POLICY STATEMENTS**

SUMMARY OF EXISTING COASTAL DEFENCE					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Balcary Bay (Auch001)	Private	Wall	4	None	Private drive to Balcary Tower
Shore Road (Auch002)	Council (Roads)	Wall & Rock Armour	4	General maintenance	Main access road (Shore Road)

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**[Balcary Bay \(Auch001\)](#)**

This section of wall lines the shoreline of Balcary Bay to the east of the Hotel (NX828490) and fringes the shoreward side of a privately owned driveway and surrounding property. Its presence benefits the access road to Balcary Tower. The condition of this asset is described as poor, overgrown by vegetation and with an undermining base. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. This area may also be subjected to wave overtopping. The 2002 Coastal Protection Inventory referred to these defences as the Balcary Port Rock Protection and stated that these coastal defence assets are privately owned.



**Plate10.1: Balcary Bay (Auch001)**

## APPENDIX D – POLICY STATEMENTS

### Shore Road (Auch002)

This section of wall and rock revetment fringes the shoreline along the Shore Road (NX81 1508). The wall fringes the seaward edge of the road, with the crest of the wall visible along the road. From the road level the wall has an estimated height of less than 50cm. The shoreline seawards of the foot of the wall is steep and lined with rock armour. The asset condition survey described this asset as in poor condition, overgrown by vegetation including some mature trees. The rock revetment located seawards of the wall is relatively steep but well packed. Based on SEPA flood mapping, the medium likelihood coastal flood extent covers part of the road, however it's landwards extent is restricted by the steep topography. This area may also be subjected to wave overtopping. The 2002 Coastal Protection Inventory referred to these defences as the Auchencairn Sea Wall Coastal Protection and stated that the defence assets are Council owned.



Plate10.2: Balcary Bay (Auch002)

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x			Hold the Line is unlikely to economically viable and therefore not progressed.
Managed Realignment	x				No opportunities for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	?	Progress a No Active Intervention policy. Potential social impacts identified.

x - Reject

✓ - Progress

? - Progress, however potential for impacts identified

! - Progress, however potential for significant impacts identified

**APPENDIX D – POLICY STATEMENTS**

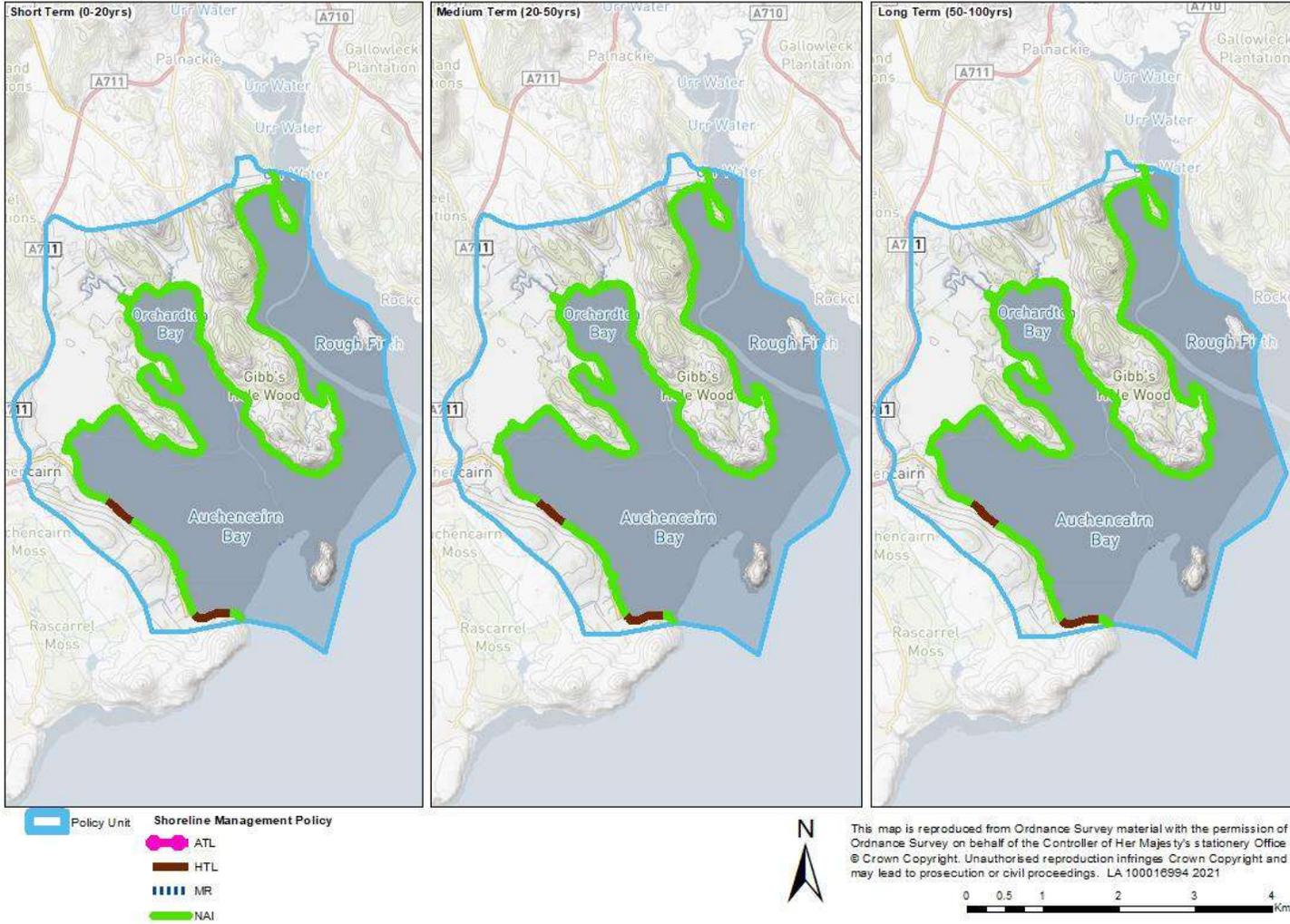
JUSTIFICATION FOR RETENTION / REJECTION			
<p>The SMP05 suggested a No Active Intervention approach with limited intervention considered when maintaining coastal defences. A general Policy of No Active Intervention should be continued within PU 10.</p> <p>A policy of Hold the Line is unlikely to be economically viable however continued maintenance of formal defences, within their current footprint should continue. It is recognised that the defence (Auch002) is required to maintain the Shore Road, which is the only access route associated with this area. While a policy of No Active Intervention should be applied to the general coastline, consideration should be given to allowing landowners to maintain existing informal or private defences if required.</p>			
SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	x	x	x
No Active Intervention	C	C	C
<p>x - Reject                      C – Consider                      A – Alternative                      *Localised</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred strategic approach for PU 10 is No Active Intervention, this policy should be applied across all epochs. This approach should however allow for the continued maintenance of existing localised coastal defence, subject to funding and resources being available to take them forward.</p> <p>The maintenance of the coastal defence that protects the Shore Road (Auch002) from seasonal flooding and erosion should continue. This will ensure the stability and continued use of this road, allowing continued access to homes and businesses. Coastal defences at Balcary Bay (Auch001) benefit private property and a private access road, it is recognised that the preferred option should not preclude the privately funded maintenance of these existing coastal defence, subject to consent.</p> <p>The preferred approach of No Active Intervention in combination with localised Hold the Line is considered across all epochs, no alternative policy has been considered. Localised Hold the Line applies only to areas of existing defences and should not permit the construction of any new defences. The preferred policy of No Active Intervention with localised Hold the Line should be applied to the entire coastal extent of PU 10 and across all epochs, as shown in Figure 10.2, which illustrates the geographical extent of No Active Intervention and localised Hold the Line policies across all epochs.</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this Policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p>			

STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, as presented during the stakeholder engagement was not updated, thus a policy of No Active Intervention with Localised Hold the Line at existing defences should be applied to PU 10 across all epochs. Figure 10.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 10.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 10.2 Policy Unit 10 Geographical Extent of Preferred Policy (0-100yr) All Epochs



### D3.4 PU 11 – Balcary Point to Torrs Point



**Figure 11.1 Policy Unit 11 Coastal Flood and Erosion Risk**

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- |                          |  |  |
|--------------------------|--|--|
| Policy Unit              | 200yr Coastal Flood Risk Receptors<br>Residential Properties | Future Coastal Erosion (2050)<br>Erosion |
| Cultural Heritage        | Non-Residential Properties                                   | Erosion Influence                        |
| Defence Asset            | Utilities  | Erosion Vicinity                         |
| Sediment Drift Direction |  |  |



## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 11 extends from Balcary Point (NX827494) in the east to Torrs Point in the west (NX673448). The coastline of PU 11 is composed of a mixture of soft sediment, hard outcrops of rock and raised shore platforms generally facing towards the south east. This policy unit is largely rural and land use is dominated agriculture and a large MoD training area. This policy unit is within CPU 2 (CPU 2), the Outer Solway Firth.</p> <p>There are environmentally designated sites within this policy unit. Two SSSIs occur along the shoreline, one extending from Balcary Point in the east to Abbey Burnfoot, and another extending from Mason's Walk to Torrs Point in the west. Balcary Point also lies within the East Stewartry Coast National Scenic Area.</p> <p>There are several cliff-top heritage sites within PU 11, including forts and homesteads, however most of these are not considered to be at erosion or flood risk. Castle Muir (NX797471) a hillfort located at the edge of a coastal promontory at Rascarrel Heugh is considered to be at flood risk. The Dynamic Coast data does not indicate that this location is at erosion risk.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data there are no properties or utilities at medium likelihood coastal flood risk within PU 11 either now or in the future.</p> <p>No roads are currently at flood risk, but in the future approximately 0.02km of minor road will potentially be at medium likelihood flood risk.</p> <p>Four hectares of agricultural land is at risk of medium likelihood coastal flooding. The majority of area affected area is Arable and Horticulture and Improved Grazing. Due to climate change this will increase to five hectares. The annual average damage associated with flooding is £878.</p> <p>The Schedule Monument, Castle Muir (NX797471) is considered to be at medium likelihood coastal flood risk. When the effects of climate change (based on UKCP09 projections) are considered there is no increase in flood risk.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	1	1
Transport roads (km)	0	0.02
Transport rail (km)	0	0
Agricultural Land (ha)	4	5
<b>Summary of Coastal Flood Risk in PU 11</b>		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change projections are based on UKCP09 projections.</p>		

## APPENDIX D – POLICY STATEMENTS

EROSION RISK								
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 11 has a predominantly rocky shoreline although there are some small areas of accretion and erosion. Dynamic Coast estimates that by 2030 some parts of the shoreline of PU 11 will have advanced seawards by up to 8m, whilst other areas will have receded by up to 7m.</p> <p>Erosion risk within PU 11 is low as tabulated below, by 2100, there will be 0.43km of road located within the Erosional Area. No homes or businesses are at erosion risk although part of a Scheduled Monument area (0.04ha of Castle Muir (NX797471) as well as a designated environmental site, SSSI (725ha) including Abbey Burn Foot to Balcary Point and Torrs to Mason’s Walk SSSI will also be within the Erosional area.</p> <p>Assets within both Erosional Area and Erosion Influence are expected to be ‘affected’ by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.</p> <p>Refer to <a href="http://dynamiccoast.com/">http://dynamiccoast.com/</a> for further details relating to the Dynamic Coast erosion information.</p>								
Homes			Businesses			Roads (all) (km)		
2050								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0.08	1.31
2100								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0.43	0.27	0.14
Summary of Coastal Erosion Risk in PU 11								
<p>This summary highlights the assets at risk under a ‘do nothing’ High Emission Scenario and a ‘do nothing’ coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be ‘affected’ by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
EXISTING COASTAL DEFENCE								
<p>There are no known existing formal or private coastal defences within PU 11.</p>								

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No justification for Hold the Line in this policy unit.
Managed Realignment	x				No existing defences to realign in this policy unit.
No Active Intervention	✓	✓	✓	✓	Progress a No Active Intervention policy. No potential impacts identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>The SMP05 states that PU 11 is an inaccessible area where the most appropriate policy is one that results in the least interference and environmental damage. The preferred option for this area was therefore No Active Intervention.</p> <p>The Policy of No Active Intervention should continue to be applied to PU 11. The shoreline should be permitted to continue to evolve under natural processes. The principal land holder within the policy unit (MoD) has agreed that this is an appropriate policy. The potential for impact on the Castle Muir Scheduled Monument may need to be considered further with Historic Environment Scotland and appropriate mitigation (including recording) given consideration. Based upon the risk ratings devised by Historic Environment Scotland, this area scored a Low Risk Level, under which this Scheduled Monument is subject to regular passive monitoring.</p>					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	x	x	x		
Hold the Line	x	x	x		
Managed Realignment	x	x	x		
No Active Intervention	C	C	C		
x - Reject C – Consider A – Alternative					
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY					
<p>The preferred strategic approach for PU 11 is No Active Intervention as there is a low risk to assets. The preferred policy of No Active Intervention should be applied to the entire coastal extent of PU 11 and across all epochs, as shown in Figure 11.2.</p>					

## APPENDIX D – POLICY STATEMENTS

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

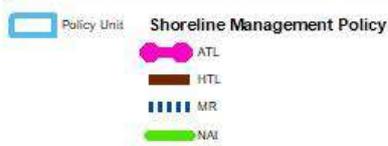
No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

### STAKEHOLDER ENGAGEMENT OUTCOME

The 'Preferred Policy' remains one of No Active Intervention applied to the entire coastal extent of PU 11 and across all epochs, as presented during the stakeholder engagement.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 11.2 Policy Unit 11 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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## 4 COASTAL PROCESS UNIT 3

CPU 3 of the Dumfries & Galloway SMP, Wigtown Bay and Kirkcudbright Bay, extends from Torrs Point in the east to west of Isle of Whithorn, including the tidal reaches of the Rivers Tarff, Dee, Cree and the Water of Fleet. There are seven policy units within CPU 3 for which the relevant management policies are identified in the following sub-sections.

D4.1 PU 12 – Torrs Point to Doon of Carsluith

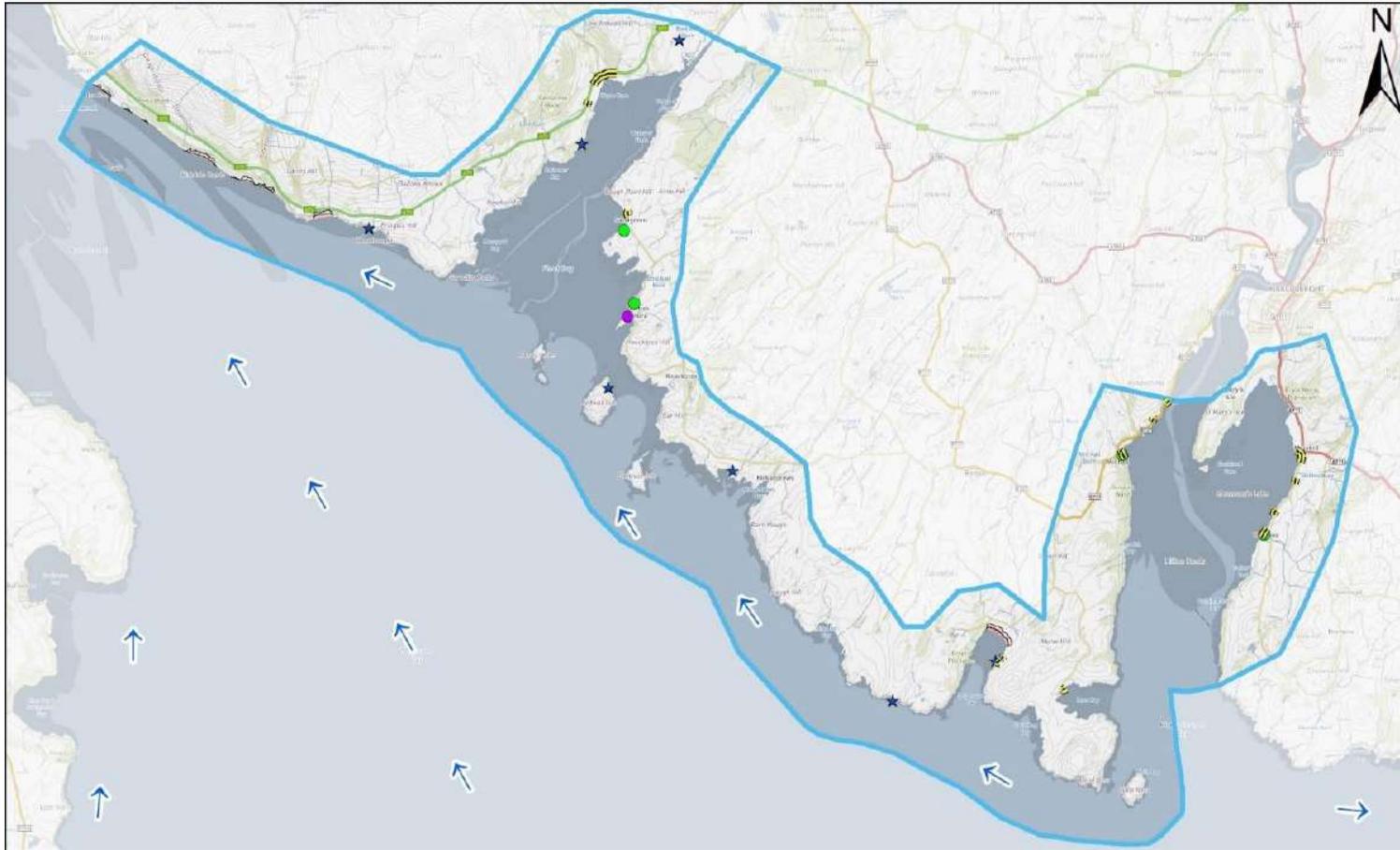


Figure 12.1 Policy Unit 12 Coastal Flood and Erosion Risk

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0 0.75 1.5 3 4.5 6 Km

- Policy Unit
- ★ Cultural Heritage
- Defence Asset
- ↑ Sediment Drift Direction
- 200yr Coastal Flood Risk Receptors  
Residential Properties
- Non-Residential Properties
- ▲ Utilities
- Future Coastal Erosion (2050)  
Erosion
- Erosion Influence
- Erosion Vicinity

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT
<p>PU 12 is mainly located on the western side of Wigtown Bay, and extends from Torrs Point (NX673448) to Sandside, south of Kirkcudbright at the head of Manxman's Lake (NX683501) and westwards to Doon of Carsluith (NX488543). This policy unit encompasses the majority of three embayment's; Kirkcudbright Bay, Brighthouse Bay and Fleet Bay in addition to the open coast. Areas of saltmarsh habitat are found within sheltered bays, including Fleet Bay and Manxman's Lake.</p> <p>The frontage is composed of a mixture of soft sediment, hard outcrops of rock and raised shore platforms. This policy unit is largely rural and is dominated by agriculture. This policy unit is within CPU 3, which includes Wigtown Bay and Kirkcudbright Bay.</p> <p>There are environmentally designated sites within this policy unit. These include the Torrs to Mason's Walk ASSI extending from Torrs Point to just south of Bathinghouse Bay, Shoulder O'Craig ASSI within Jock's Bay, Borgue Coast ASSI extending from north of Riss Bay in the east to Airds Bay in the west, and Ravenshall Wood ASSI extending from just west of Auchenlarie Holiday park almost to Carsluith. The area of Fleet Bay also lies within the Fleet Valley National Scenic Area.</p> <p>There are several coastal structures including walls and embankments located within PU 12, principally fringing Kirkcudbright Bay and Brighthouse Bay. These coastal defences are in various states of repair.</p>
FLOOD RISK
<p>Based on SEPA strategic flood mapping data it is estimated that four homes and one business property are at a medium likelihood coastal flood risk. By 2080, when the anticipated impacts of climate change are considered this will increase to six homes and three business premises at coastal flood risk.</p> <p>In addition 2.6km of road is presently at risk of flooding, increasing to 3.5km, when the anticipated impacts of climate change are considered. The majority of roads affected are minor roads, however there is a small section of the A75 at Skyburn Bay and part of the B727 at risk of coastal flooding.</p> <p>105 hectares of agricultural land is at risk of medium likelihood coastal flooding. Approximately 50% of the affected area is Improved Grazing. Due to climate change this will increase to 124 hectares. The annual average damage associated with flooding is £222,466.</p> <p>There are no utilities or community facilities identified to be at a medium likelihood coastal flood risk either now or in the future. There are seven cultural heritage features at coastal flood risk including two Listed Buildings and five Scheduled Monuments. The Listed Buildings include Rockvale Quay (Category B) and Cardoness Chapel (Category C). The scheduled monuments include Ardwall Island, Castle Haven, Borness Fort, Kirkclaugh Mote and Boreland or Green Tower Mote. No further cultural heritage features are at coastal flood risk due to climate change.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	4	6
Business Premises	1	3
Utilities	0	0
Community facilities	0	0
Cultural Heritage	7	7
Transport roads (km)	2.6	3.5
Transport rail (km)	0	0
Agricultural Land (ha)	105	124

### Summary of Coastal Flood Risk ib PU 12

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change projections are based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

Dynamic Coast data indicates that some sections of the shoreline of PU 12 are at risk of coastal erosion, although there are also some areas of accretion. The small areas of sediment accretion mostly occur in the west of PU 12 particularly along the shoreline of the East Channel. However Dynamic Coast estimates that by 2050, these areas of accretion will have changed to areas of erosion, such that by 2030, the coastline will have retreated by between 7m and 9m.

However the erosion risk within PU 12 is low, as tabulated below, with no homes or businesses anticipated to be at erosion risk by 2050 although a designated environmental site including the Brogue Coast SSSI (427Ha) will be situated within the Erosion Influence zone.

By 2100 it is estimated that 0.07km of the A75 at Kirkcubright will be located within the Erosion Vicinity, while the risk to the Brogue Coast SSSI will have increased with 384Ha located within the Erosional Area with another 193Ha situated within the Erosion Influence.

Assets within both Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion, but should be identified as part of future planning.

Refer to <http://www.dynamiccoast.com/> regarding erosion assessment information.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0.07
<b>Summary of Coastal Erosion Risk in PU 12</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
<b>EXISTING COASTAL DEFENCE</b>								
<p>There are several coastal structures including walls and embankments located within PU 12, principally within Kirkcudbright Bay and Brighthouse Bay, which are generally in reasonable condition. Private coastal defences are located along the shore at Parkgate (NX678469) where rock armour provides protection to properties and the shore road. At Carrick (NX577506) there are a further series of private defences that protect properties located here. Please note that Kirk008 was not inspected due to limited access and associated health and safety issues.</p>								
<b>SUMMARY OF EXISTING FORMAL DEFENCE</b>								
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area			
Mill Hall (Kirk001)	Private	Embankment	4	Maintenance required	Private property			
(Kirk002)	Private	Wall	3	Maintenance required	Private property			
(Kirk003)	Private	Embankment	4	Maintenance required	Private property			
Shoulder O'Craig (Kirk004)	Council (Roads)	Wall	3	Maintenance required	B727			
(Kirk005)	Council (Roads)	Wall	4	Maintenance required	B727			

## APPENDIX D – POLICY STATEMENTS

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Seaward Road (B727) (Kirk006)	Council (Roads)	Wall	2	-	B727
(Kirk007)	Council (Roads)	Wall	2	-	B727
Mutehill (Kirk009)	Private	Embankment	4	Maintenance required	Minor Road & properties
(Kirk010)	Private	Embankment	3	Maintenance required	Minor Road & properties
(Kirk011)	Private	Embankment	4	Maintenance required	Minor Road & properties
Mutehill Bridge (Kirk012)	Council (Roads)	Embankment	3	Maintenance required	Minor Road
(Kirk013)	Council (Roads)	Embankment	3	-	Minor Road & properties
Brighthouse (Brig001)	Private	Promenade	3	Maintenance required	Private Road
(Brig002)	Private	Promenade	3	Continued monitoring	Private Road
(Brig003)	Private	Promenade	5	Maintenance required	Private Road
(Brig004)	Private	Wall	3	Maintenance required	Private Road
(Brig005)	Private	Wall	4	Maintenance required	Private property
Skyreburn Bay	-	Embankment	-	-	-
Sandgreen	-	Wall	-	-	-
Ross Bay	-	-	-	-	-
Grange	-	Wall	-	-	-

\*Refer to Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P' for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Mill Hall (Kirk001-003)**

This section of coastal defence fringes the shoreline at Mill Hall (NX657485) on the western shore of Kirkcudbright Bay along the western shoreline of Goat Well Bay. The presence of this coastal defence benefits private property. The asset condition survey described this defence asset as being in poor condition, with evidence of erosion along its base and protruding vegetation in some places. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this formal defence. Maintenance of this asset is recommended. The 2002 Coastal Protection Inventory referred to this defence as the Doon Bay / Mill Hall rock protection and stated that the defence assets are privately owned.



**Plate 12.1: a. Kirk001 (Embankment)**

**b. Kirk002 (Wall)**

**Shoulder O’Craig (Kirk004-005)**

This section of coastal defence fringes the shoreline of the Shoulder O’Craig SSSI, on the western shore of Kirkcudbright Bay and benefits the B727 road. The asset condition survey described this asset as in a fair to poor condition. It is overgrown by vegetation along its crest. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this formal defence. The 2002 Coastal Protection Inventory stated that these defence assets are Council (Roads) owned.



**Plate 12.2 Kirk004 (Wall)**

## APPENDIX D – POLICY STATEMENTS

### Seaward Road (B727) (Kirk006-007)

This section of coastal defence fringes the shoreline at Seaward (NX664493) on the western shore of Kirkcudbright Bay alongside the B727 and its presence benefits this road. This wall also supports a steep cliff in places. The asset condition survey described this asset, particularly the wall as in a good condition, with no protruding vegetation or cracking. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this formal defence. The 2002 Coastal Protection Inventory referred to these defences as the Seaward Caravan Park Sea Wall and stated that the defence assets are Council (Roads) owned.



Plate 12.3: Kirk006 (Wall)

### Mutehill (Kirk009-011)

This section of wall fringes the shoreline at Mutehill along the eastern shoreline of Manxman's Lake (NX685483) on the eastern shore of Kirkcudbright Bay alongside a minor road. Its presence benefits several properties and the access road from Mutehill to Parkgate (NX679472). The asset condition survey described this asset as in a fair to poor condition. Rock armour has large voids with evidence of slumping therefore maintenance is required. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence in places. These are private defences.



Plate 12.4: Kirk010 (Embankment)

**Mutehill Bridge (Kirk012 & Kirk013)**

This section of wall fringes the shoreline at Mutehill Bridge on the eastern shoreline of Manxman’s Lake (NX680472) along the seaward edge of a minor road and its presence benefits several properties and the access road from Mutehill to Parkgate (NX679472). The asset condition survey described this asset as in a fair condition. Rock armour is well packed but with slumping, and some minor vegetation growth therefore maintenance is required. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence in places. The 2002 Coastal Protection Inventory referred to these defences as the Lake Road rock protection and stated that the defence assets are Council (Roads) owned.



**Plate 12.5: Kirk013 (Embankment)**

**Brighthouse Bay (Brig001-005)**

This section of wall and promenade is located along the eastern shoreline of Brighthouse Bay and fringes a small section of the Bogue coast SSSI. This asset adjoins a privately owned driveway and property and benefits the access road to Brighthouse Bay Holiday Park. The asset condition survey described this asset as in a fair to very poor condition. A 52m section of promenade (Brig003) incorporating Rockvale Quay (NX636452), a Listed Building (Category B) is in very poor condition. The rock armour is described as sparse with evidence of scouring at its base. The crest of this particular defence has large voids, is uneven with vegetation growth. Maintenance is required, including the re-packing of the rock armour. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences.

**APPENDIX D – POLICY STATEMENTS**



**Plate 12.6 a. Brig002 (Wall) b. Brig003 (Wall)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✗				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✗			Hold the Line is not progressed as it is highly unlikely to be economically justifiable.
Managed Realignment	✗				No opportunity identified for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	✓	Progress No Active Intervention policy. No potential impacts identified.

- ✗ - Reject
- ✓ - Progress
- ? - Progress, however potential for impacts identified
- ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

The SMP05 recommended that a general policy of No Active Intervention should be applied to this shoreline although with allowance for localised Hold the Line.

The preferred strategic approach is to continue to implement the policy of No Active Intervention for PU 12, with no new defences permitted. Localised maintenance works to reduce risk to public roads should however be continued. There are limited properties or other assets at risk from coastal flooding and

## APPENDIX D – POLICY STATEMENTS

erosion as such there is no economic justification for building new defences. This is also an important area for its natural landscape and environmental habitats.

While the recommended strategic approach is one of No Active Intervention, the risk to the A75 should be monitored and managed as required, through maintenance and upgrading of any existing defences in the future.

Other formal defences are in a fair to very poor condition and these should be sustained within their existing footprint, subject to funding and resource availability to take them forward.

### SELECTION OF POLICY

Policy	Short-Term (0-20yr)	Medium-Term (20-50yr)	Long-Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	x	A*	A*
No Active Intervention	C	C	C

x - Reject

C – Consider

A – Alternative

\* Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 12 of No Active Intervention is considered across all epochs. This is the preferred option since there are limited assets at risk and it will allow the coastline to evolve naturally. However it is acknowledged that there are some existing coastal structures within PU 12, and the reactive repair of coastal structures should be permitted, when required. It is uncertain if this approach will sustain the effectiveness of these defences for the long term and thus any increase in risk will need to be reviewed regularly.

A policy of limited intervention should also apply to the management of the potential coastal flood risk to the A75 at Skyburn Bay.

It may be necessary to liaise with NatureScot since the continued maintenance of formal defence assets that fringe the shoreline at Shoulder O’Craig SSSI would require consent. It should be noted that the presence of these defence assets potentially benefit the B727.

The inclusion of the Brighthouse Bay defence assets on the Council asset register should be reviewed, since they benefit a private access road. If works are proposed at this location consent should be sought from NatureScot as the Brighthouse Bay defences fringe a small section of the Borgue coast SSSI.

Consultation with Historic Environment Scotland is also required due to the potential impact on heritage and landscape features (Listed Buildings and Schedule Monuments) identified to be at coastal flood risk. Advice regarding the maintenance of the Cultural and Heritage asset ‘Rockvale Quay’ should also be sought.

It is important to be aware that recommended activities are subject to funding and resource availability to take them forward.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 12 and across all epochs, as shown in Figure 12.2

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

## APPENDIX D – POLICY STATEMENTS

The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, the change in risk does not warrant a change to the Preferred Policy.

### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention in combination with localised Hold the Line, as presented during the stakeholder engagement was not updated. Figure 12.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 12.

**GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES**

**Figure 12.2 Policy Unit 12 Geographical Extent of Preferred Policy (0-100yr) All Epochs**



**Policy Unit**

**Shoreline Management Policy**

- Policy Unit
- ATL
- HTL
- MR
- NAI

0 1.25 2.5 5 7.5 10 Km

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D4.2 PU 13 – St Mary’s Isle to Tongland (Kirkcudbright)

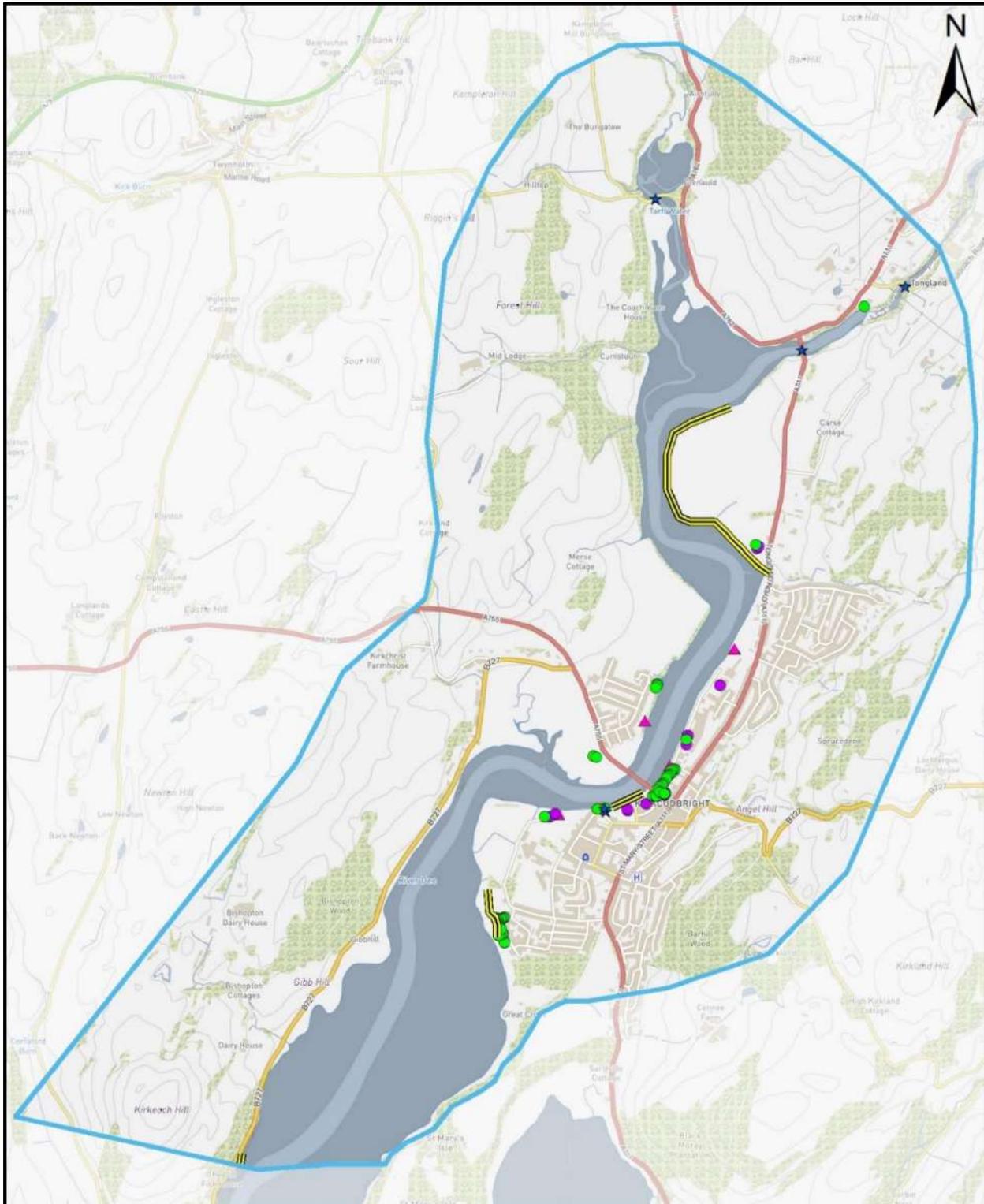


Figure 13.1 Policy Unit 13 Coastal Flood and Erosion Risk

- |                          |                                    |                               |
|--------------------------|------------------------------------|-------------------------------|
| Policy Unit              | 200yr Coastal Flood Risk Receptors | Future Coastal Erosion (2050) |
| Cultural Heritage        | Non-Residential Properties         | Erosion Influence             |
| Defence Asset            | Utilities                          | Erosion Vicinity              |
| Sediment Drift Direction |                                    |                               |

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0 0.25 0.5 1 1.5 2 Km

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT
<p>The River Dee that flows through PU 13 and the town of Kirkcudbright is tidally affected resulting in the exposure of extensive areas of mud bank at low tide. There are also areas of saltmarsh and reed habitat located along the banks of the River Dee. The tidal extent of the River Dee ends close to Tongland (NX684547) upstream of the confluence of the Tarff and River Dee. This area also represents the northern extent of PU 13 while the southern extent is situated close to St Marys Isle (NX671493) where it abuts PU 12. PU 13 is located within CPU 3 which includes Wigtown and Kirkcudbright Bays.</p> <p>The town of Kirkcudbright is the main settlement within PU 13, mainly located on the east bank of the River Dee. The land to the west of the River Dee is generally less densely populated and largely rural. SEPA have designated the town Kirkcudbright as an Objective Target Area. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.</p> <p>There are no environmentally designated sites within this policy unit.</p>
FLOOD RISK
<p>Based on SEPA strategic flood mapping data 70 homes and 15 business premises are currently at risk of medium likelihood coastal flooding. By 2080, when the anticipated impacts of climate change are considered, this will increase to 120 homes and 40 business premises at coastal flood risk.</p> <p>In addition, 1.5km of road is presently at flood risk increasing to 2km, when the anticipated impacts of climate change are considered. This includes 0.2km of the A755, A762 and Bridge Street although the majority of roads affected are local streets and minor roads.</p> <p>27 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 47% of the affected area is Arable and Horticulture. Due to climate change this will increase to 37 hectares. The annual average damage associated with flooding is £257,660.</p> <p>There are four utilities identified to be at a medium likelihood coastal flood risk, increasing to five in the future. All the identified at risk utilities are managed by Scottish Water.</p> <p>There are two community facilities currently at coastal flood risk with no change identified when 2080 climate change flooding is considered. Community facilities affected include a Coastguard Station and a Village Hall.</p> <p>There are currently five cultural heritage features or Listed Buildings at a medium likelihood coastal flood risk. In the future, it is estimated that eight cultural heritage features will be at flood risk, including Listed Buildings and a Garden and Designed Landscape (Broughton House).</p>

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	70	120
Business Premises	15	40
Utilities	4	5
Community facilities	2	2
Cultural Heritage	5	8
Transport roads (km)	1.5	2.0
Transport rail (km)	0	0
Agricultural Land (ha)	27	37

**Summary of Coastal Flood Risk in PU 13**

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

**EROSION RISK**

The Dynamic Coast second phase data does not extend into PU 13 therefore no assessment of coastal erosion risk has been possible.

**EXISTING COASTAL DEFENCE**

Formal defences associated with PU 13, include Kirkcudbright Quay (Kirk008) at (NX683511) and a 1.3km earthen embankment along the eastern bank of the River Dee at Janefield (NX686527). The mid-19<sup>th</sup> Century maps of this area show that the Janefield embankment was historically present (Refer to <https://maps.nls.uk/view/74427665%20Kirkcudbrightshire>). A review of Google Maps also shows that this embankment can be traced southwards from Janefield towards Kirkcudbright. This raised area now forms the Dee Walk, the seaward edge of which is embanked. Saltmarsh is located seaward of this embankment, whilst local businesses and homes are located landwards. To the south of PU 13, there are areas of parkland at Great Cross, this area is also fronted by earthen embankments. It is assumed that these embankments are privately owned. No further information is available.

Due to access issues, a condition survey of the formal coastal defence assets was not undertaken at Kirkcudbright Quay (Kirk008). Formal defence assets surveyed within PU 13 are summarised below.

**SUMMARY OF EXISTING COASTAL DEFENCE**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Janefield001	Private	Embankment	3	Maintenance required	Agricultural land
Kirk008	Council	Quay	3	-	-
Castle Dykes	Unknown	Wall	-	-	-

## APPENDIX D – POLICY STATEMENTS

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### [Janefield \(Janefield001\)](#)

This section of coastal defence assets is 1.3km of earthen embankment that fringes the east bank of the River Dee. It is located downstream of Tongland and the tidal extent of the river. The defence asset runs adjacent to the river bank, providing some flood protection to an area of level agricultural land located landwards.

The asset condition survey described these defence assets as being in fair condition. This embankment is used as a public pathway and shows some evidence of erosion. It is also well vegetated in places. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence, affecting an area of agricultural land. Maintenance of this asset is recommended. The 2002 Coastal Protection Inventory states that this coastal defence is privately owned.



**Plate 13.1 Janefield001(Embankment)**

### [Kirkcudbright Harbour](#)

This harbour (Quay) is described as the busiest commercial harbour in Dumfries & Galloway, with much of the landed catch processed locally. Kirkcudbright Quay (Kirk008) was not inspected during this survey campaign as access to the quay was restricted. The Council holds a Revision Order for Kirkcudbright Harbour that permits the council to legally improve, maintain and manage the harbour, refer to <https://www.dumgal.gov.uk/article/15846/Kirkcudbright-Harbour>.

**APPENDIX D – POLICY STATEMENTS**

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✓	?	✓	Hold the Line is progressed, although there are potential environmental & heritage impacts identified.
Managed Realignment	✓	?	✓	?	Managed Realignment is progressed as there are some opportunities for this strategic policy. Economic and social impacts are identified.
No Active Intervention	x				No Active Intervention is not appropriate given the proximity of existing at risk assets to the shoreline.
JUSTIFICATION FOR RETENTION / REJECTION					
<p>The SMP05 favoured a policy of No Active Intervention over most of this shoreline, with Hold the Line applied to selected areas. Managed realignment was considered for the undeveloped human and built environment. A localised Hold the Line policy should continue, this will enable the flood risk associated with the Kirkcudbright urban area to be managed by maintaining existing defences, although implementation of a Hold the Line policy will require the improvement of formal coastal defence assets. In the future, it may be necessary to raise the crest or modify the defences to address any outflanking associated with anticipated climate change effects. A detailed review of the formal defences at the Quay should be undertaken and these defences maintained and upgraded as necessary.</p> <p>To the north of the town, the presence of the Janefield embankment, may provide some protection to adjacent farmland and the A711. As an alternative, this area may provide an opportunity for Managed Realignment. Other potential areas for Managed Realignment are located south of the town. The confirmation of potential areas for Managed Realignment should be subject to further and detailed investigation. Managed Realignment has the potential to allow the floodplain to function naturally, allowing the storage of flood water and for the enhancement of saltmarsh habitat within this area. Potential socio-economic impacts associated with managed realignment are related to the loss of parkland, recreational walkways and agricultural land. More detailed studies, including modelling of river flows and sediment transport are required to ensure that any Managed Realignment has no unintended impact to the urban area and adjoining coastal habitats.</p>					

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	A*	A*	A*
No Active Intervention	C	C	C
<p>x - Reject            C – Consider            A – Alternative            * - localised</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred strategic management approach due to the high potential for coastal flood damage in PU 13, is to implement a policy of Hold the Line, across all epochs in the urbanised areas. Elsewhere a policy of No Active Intervention should be considered, however this must be caveated by the fact that the Dynamic Coast information relating to coastal erosion does not extend into PU 13.</p> <p>Implementation of a Hold the Line policy will require the continued maintenance of existing defences. Over the medium and longer term the improvement of coastal defence assets should be reviewed in detail. If it is necessary to raise the crest or modify the defence to address any outflanking associated with anticipated climate change effects, modelling may be required to assess defence efficiency and potential impact to the environment.</p> <p>There are also potential opportunities for Managed Realignment identified within the area, this approach should be considered over all epochs. It is tentatively suggested that the Janefield defence to the north of the town could be targeted as well as parkland located to the south of the town. This area could potentially provide storage for flood waters as well as allowing the landward advance of saltmarsh habitats. The consent of the National Trust and other private landowners will be required. Any future works will depend upon funding being available to take them forward and should be subject to more detailed scheme level appraisal of options and the granting of appropriate consents and permissions. Elsewhere, a policy of No Active Intervention should be adopted.</p> <p>A policy of No Active Intervention should be applied generally to the coastal extent of PU 13 for all epochs, as shown in Figure 13.2 which provides a guide of the spatial extent of the preferred shoreline management approach. The policy of Hold the Line should be applied locally to the coastline where coastal flood receptors have been identified. The alternative policy of Managed Realignment should be considered over all epochs should the coastal defences become unsustainable.</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>During public and stakeholder engagement held through March and April 2021, concern was raised that a reed bed located at the confluence of the Dee and the Tarff (Tongland) was not mentioned in this study. It was also noted that this is one of the largest reed beds in Scotland and should be considered as a valuable environmental asset. The Salt Marsh Survey of Scotland referenced for the SMP classified this area as 'Swamp'. The site referred to is also currently undesignated and hence does not get specific mention in the SMP. The preferred policy of No Active Intervention will allow this natural feature to continue to function and evolve.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>Review of the responses and feedback received during the stakeholder engagement period, indicated a need to change the 'Preferred Policy' of No Active Intervention applied to the entire coastal extent of PU 13 and across all epochs to include a selective Hold the Line policy, applied locally where coastal flood receptors have been identified, and an alternative policy of Managed Realignment should the coastal</p>			

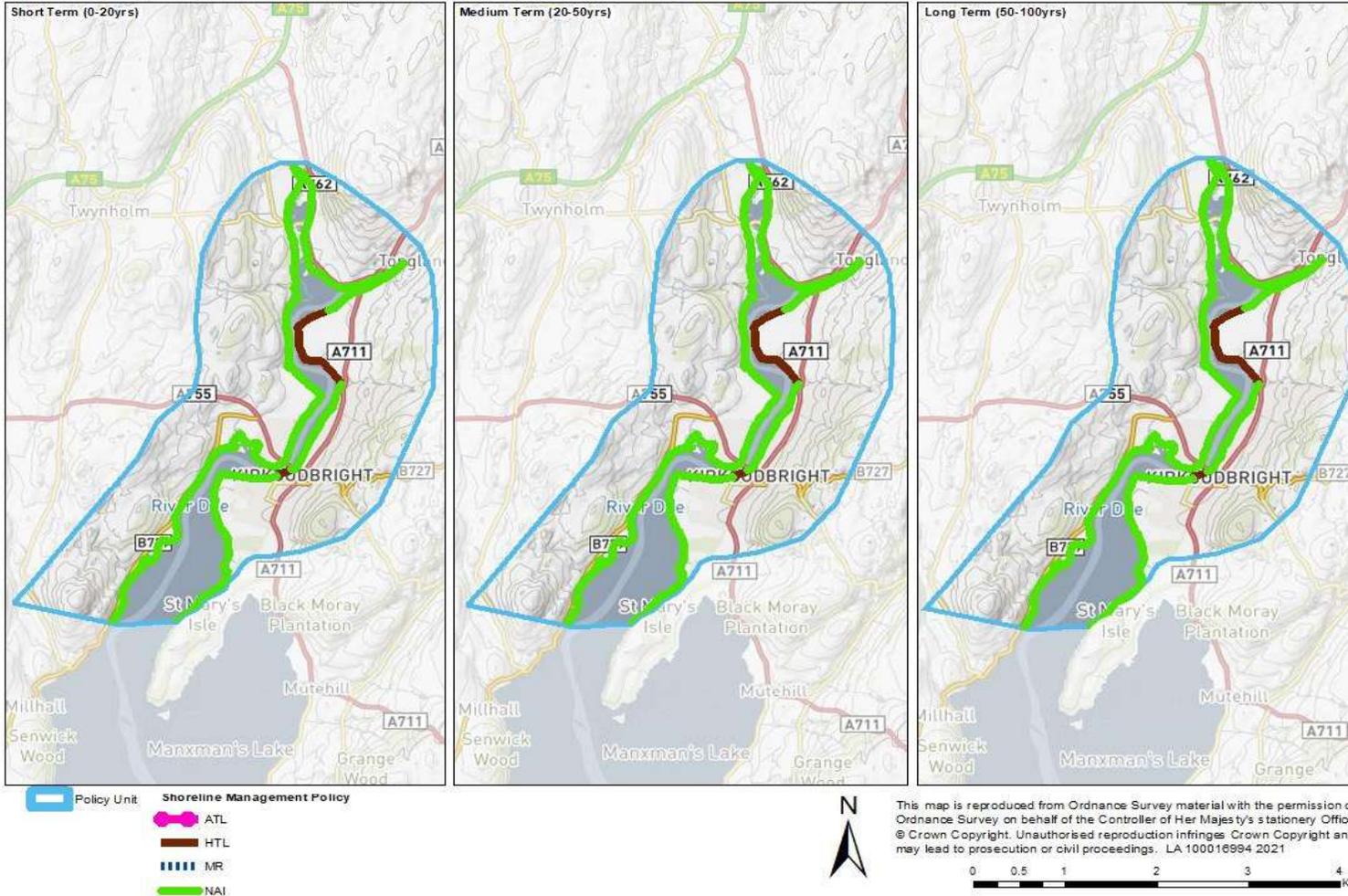
## APPENDIX D – POLICY STATEMENTS

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defences become unsustainable. Figure 13.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 13.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 13.2 Policy Unit 13 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D4.3 PU 14 – Gatehouse of Fleet

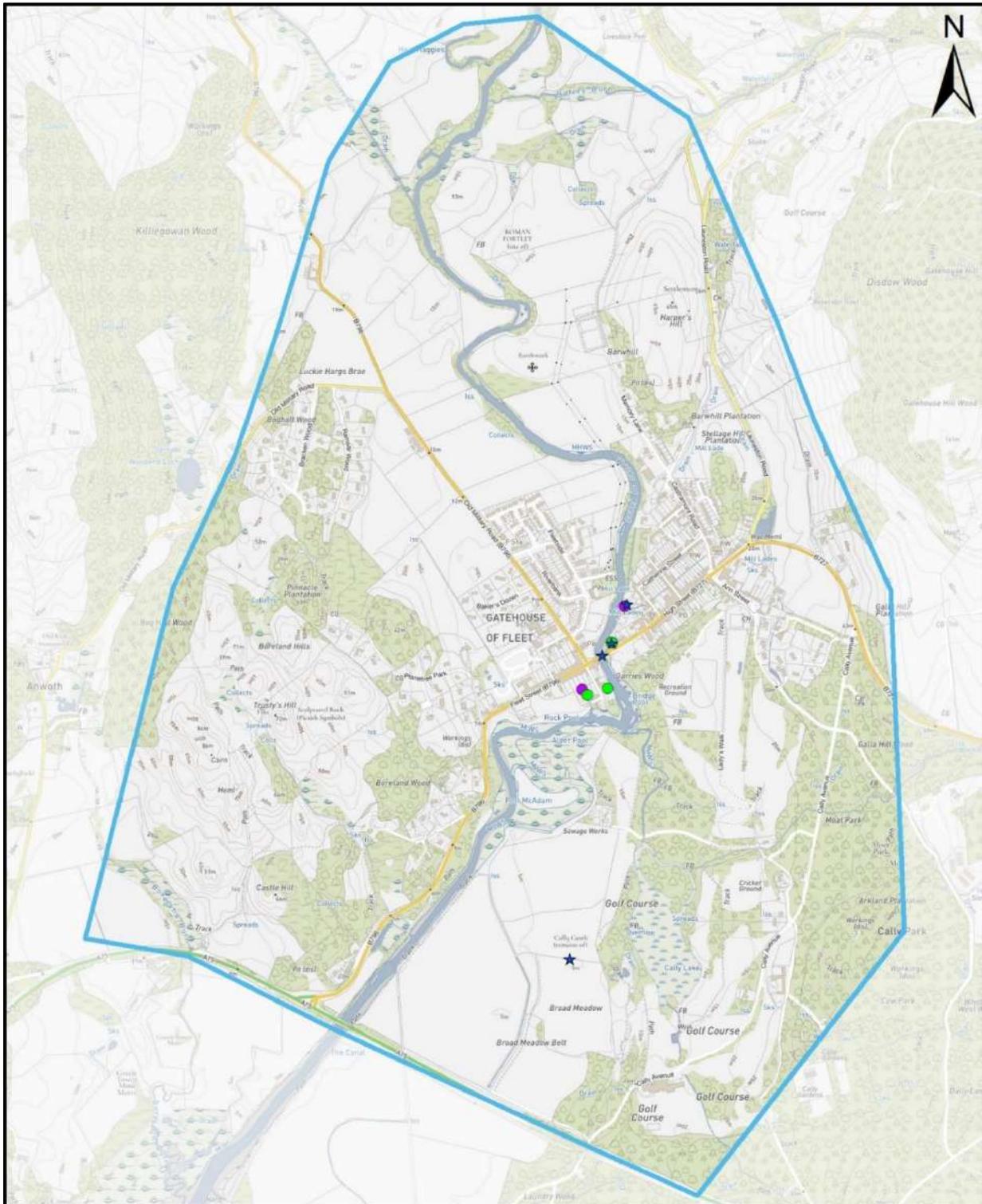


Figure 14.1 Policy Unit 14 Coastal Flood and Erosion Risk

- |                          |   |                                       |
|--------------------------|---|---------------------------------------|
| Policy Unit              | 200yr Coastal Flood Risk Receptors Residential Properties | Future Coastal Erosion (2050) Erosion |
| Cultural Heritage        | Non-Residential Properties                                | Erosion Influence                     |
| Defence Asset            | Utilities   | Erosion Vicinity                      |
| Sediment Drift Direction |   |                                       |

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0 0.125 0.25 0.5 0.75 1 Km

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 14 encompasses the Water of Fleet from the boundary of PU 12 at (NX590551) to upstream of Gatehouse of Fleet. The Water of Fleet is affected by the tide as it flows through PU 14 and the town of Gatehouse of Fleet. Large scale mapping indicates the tidal extent of this river to be located to the north of the town close to Sprott's Pool (NX596580). The town is situated on topography that rise steeply away from the edge of the river while the river channel downstream of Port McAdam (NX595556) and beyond the A75 road bridge is canalised. To the east of this is an area of reclaimed agricultural land. PU 14 is located within CPU 3 which includes Wigtown and Kirkcudbright Bays.</p> <p>The entirety of this policy unit lies within the National Scenic Area of the Fleet Valley.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data five homes and four business premises are currently at risk of medium likelihood coastal flooding. By 2080, when the anticipated impacts of climate change (based on UKCP09 projections) are considered this will increase to seven homes with no further business premises estimated to be at flood risk.</p> <p>In addition, a small section (0.35km) of road is shown to presently be at flood risk increasing to 0.42km, when the anticipated impacts of climate change are considered. The road that is mainly impacted is the B796 that runs adjacent to the Water of Fleet.</p> <p>42 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 50% of the affected area is Arable and Horticulture. Due to climate change this will increase to 46 hectares. The annual average damage associated with flooding is £28,095.</p> <p>There is one utility (Scottish Water) identified to be at future coastal flood risk.</p> <p>There are currently four cultural heritage features at a medium likelihood coastal flood risk, all of which are Listed Buildings (2 Category B &amp; 1 C). In the future, it is estimated that seven cultural heritage features will be at flood risk, including Listed Buildings and a Garden and Designed Landscape (Cally).</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	5	7
Business Premises	4	4
Utilities	0	1
Community facilities	0	0
Cultural Heritage	4	7
Transport roads (km)	0.35	0.42
Transport rail (km)	0	0
Agricultural Land (ha)	42	46
<p><b>Summary of Coastal Flood Risk in PU 14</b></p> <p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		

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EROSION RISK					
The Dynamic Coast second phase data does not extend into PU 14 and thus it was not possible to quantify erosion risk. Refer to <a href="https://www.dynamiccoast.com">https://www.dynamiccoast.com</a> for further details relating to Dynamic Coast.					
EXISTING COASTAL DEFENCE					
There are no existing coastal defences associated with PU 14.					
A review of historical maps of this area indicates raised embankments located along the canalised section of the Water of Fleet at Castle Bridge (Refer to <a href="https://maps.nls.uk/view/74427657">https://maps.nls.uk/view/74427657</a> for further information). It is tentatively suggested that the presence of these embankments may benefit the B796 that runs adjacent to this area (NX593554). The presence of the embankment on the eastern side of the channel protects reclaimed agricultural land.					
REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x			Hold the Line is not progressed since there are no existing defences and it is unlikely to be economically viable to implement new defences within this Policy unit.
Managed Realignment	✓	?	✓	?	Managed Realignment is progressed, although economic and social impacts are identified.
No Active Intervention	✓	✓	✓	?	Progress No Active Intervention, although potential social impacts are identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
The SMP05 policy recommended a limited intervention approach, since it identified little risk associated with PU 14. A Hold the Line approach was considered for selected areas including Alder Pool. Whilst Managed Realignment was considered for other areas, including the east side of the Water of Fleet. No Active Intervention was considered over the longer term (>50years).					
There are limited assets at risk within PU 14, therefore a policy of No Active Intervention is acceptable. However in common with other policy units this should be implemented through a do minimum approach to allow for the maintenance of existing private defences if required.					
This would enable the localised flood risk associated with properties located adjacent to the Water of Fleet as it flows through the town to be managed.					
There may be an opportunity to the south of the town whereby Managed Realignment could potentially be applied. This approach would involve removal of the raised embankments to encourage the channel to revert to its natural state with the re-establishment of the natural function of the reclaimed floodplain at Cally. This approach would potentially support the creation of saltmarsh habitat but at the expense of					

## APPENDIX D – POLICY STATEMENTS

prime agricultural land. Implementation of this approach could present many challenges since it acts against local farming interests.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	x
Managed Realignment	A*	A*	C*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \*Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach is one of No Active Intervention, through introducing no new defences, but still allowing maintenance works to manage the flood risk to homes and businesses on the basis that there is unlikely to be any justification for the development of long term flood defence solutions. The repair and maintenance of private defences within their current footprint would remain appropriate however it is unlikely that this would qualify for a significant portion of government funding and alternative funding will be required.

There are potential opportunities for Managed Realignment identified within the area, which should be considered over all epochs. The selection of potential realignment areas is subject to further detailed review and assessment, however it is tentatively suggested that the reclaimed agricultural land at Cally, located along the east bank of the Water of Fleet could be targeted. This area could potentially provide an opportunity for habitat creation. The consent of the National Trust and other private landowners will be required.

Consultation with Historic Environment Scotland would also be required due to the potential impact on heritage and landscape features, including the Garden and Designated Landscape at Cally.

It is important to be aware that any recommended activities are subject to the availability of funding and resources.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 14 and across all epochs, as shown in Figure 14.2

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

A questionnaire return received during the public and stakeholder engagement, undertaken through March and April 2021, disagreed with the preferred policy of No Active Intervention. The response described how the channel banks south of the town are eroding resulting in the channel becoming shallow and wider. Scheme level detail was provided describing how bank reinforcement and channel dredging could reduce the risk of flooding to the town.

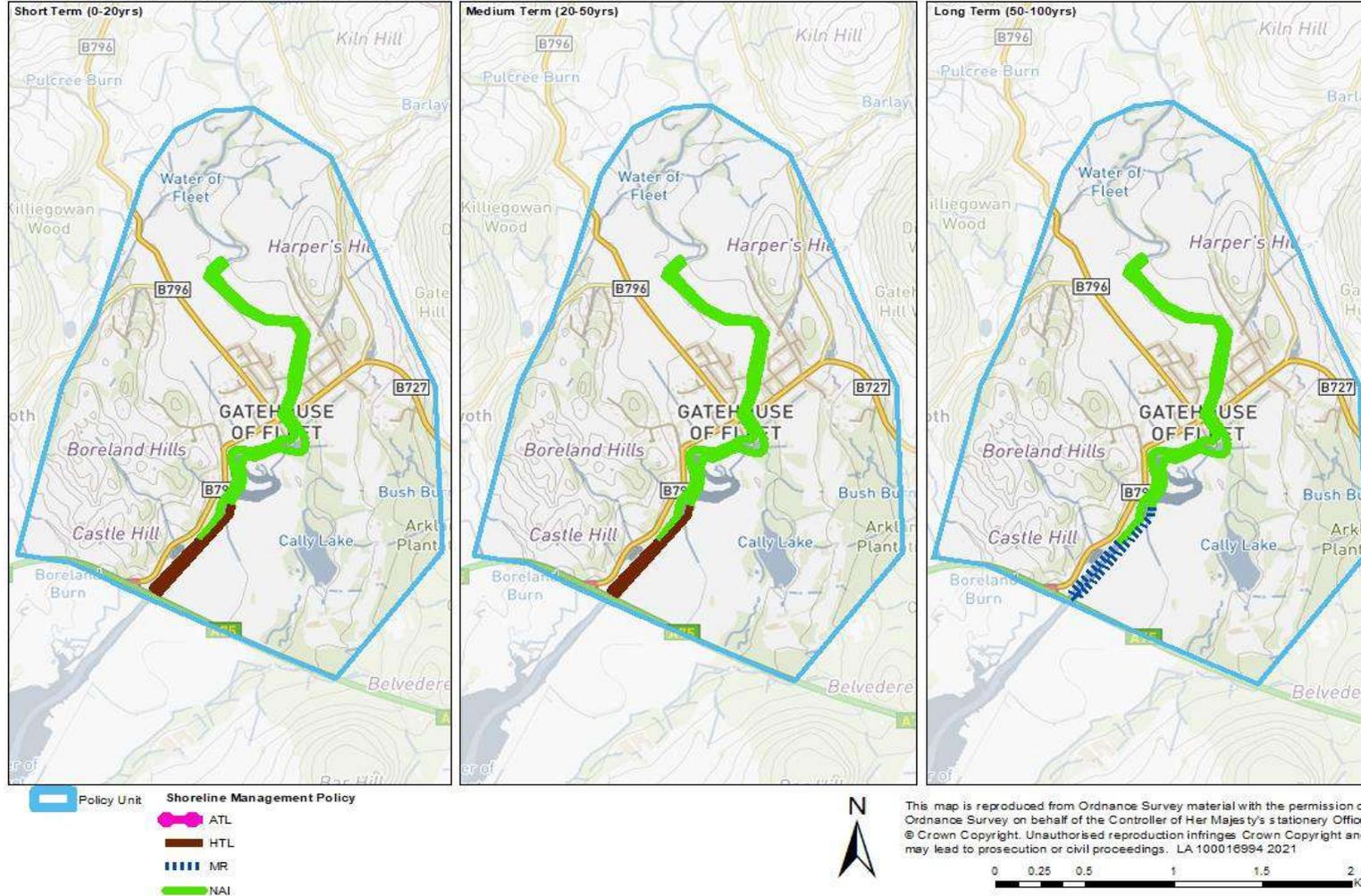
A loss of sediment cover leading to the exposure of bedrock, particularly from Mossyard to the Murray Isles and on all of the Fleet estuary beaches was also described.

### STAKEHOLDER ENGAGEMENT OUTCOME

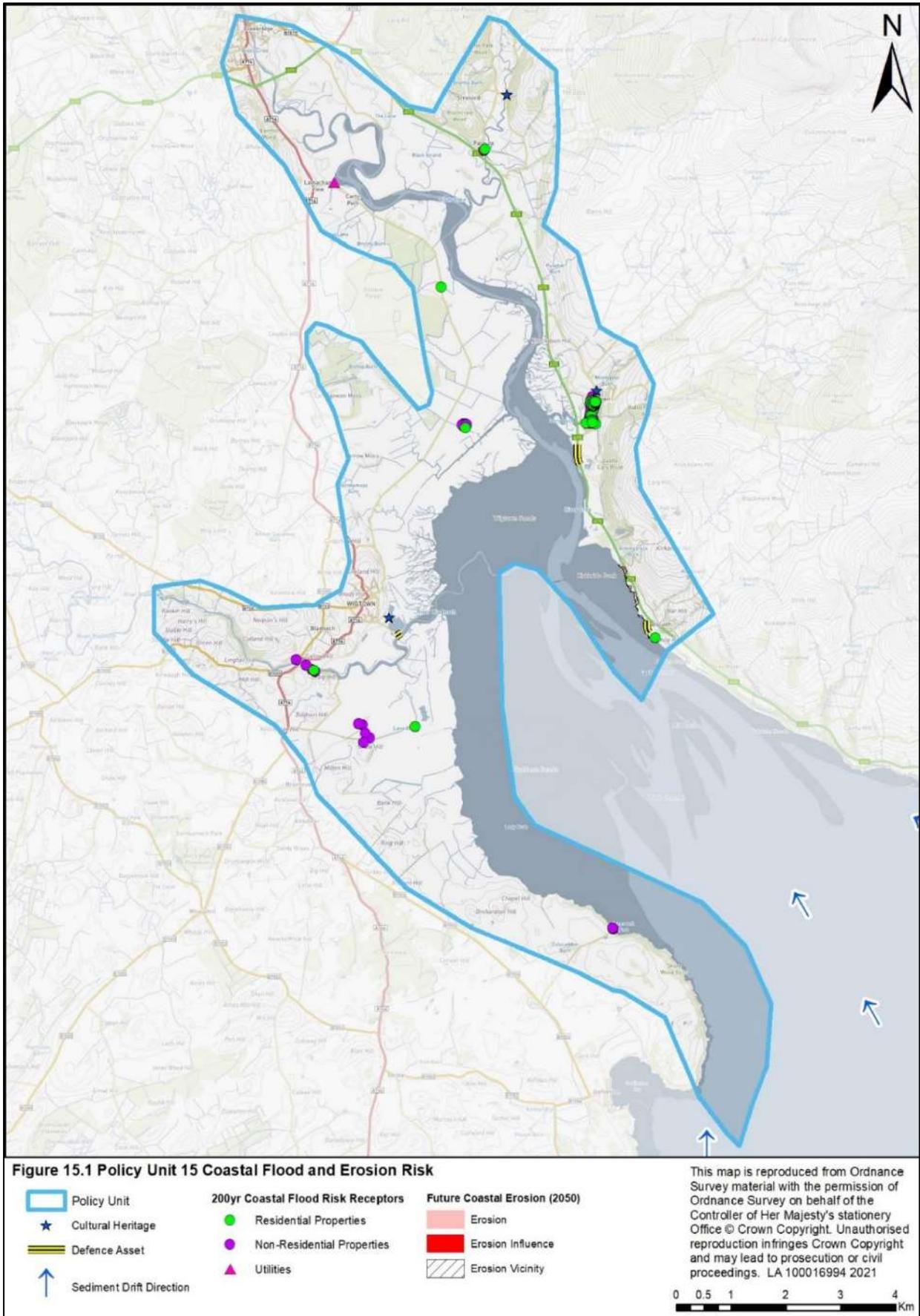
After review of the feedback received during the stakeholder engagement period, and consideration of the identified level of risk with PU 14, it was concluded that the 'Preferred Policy' of No Active Intervention with localised Hold the Line/Managed Realignment for PU 14, was still applicable. Figure 14.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 14.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 14.2 Policy Unit 14 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D4.4 PU 15 – Doon of Carsluith to Eggersess Point



**DESCRIPTION OF POLICY UNIT**

PU 15 includes the western shoreline of Wigtown Bay and the tidally influenced section of the River Cree as far upstream as Newton Stewart along with other tidally influenced tributaries that join with the River Cree. At low tide extensive areas of mud and sandflat are exposed as identified in the Salt Marsh Survey of Scotland (SSS). This policy unit extends from the Doon of Carsluith (NX488543) towards Eggerness Point (NX493465). The northern extent is defined by the tidal extents of the Bishops Burn (NX423602), River Cree (NX409657) and Palnure Burn (NX458656).

PU 15 is located within CPU 3 which represents the central and southern portion of the northern shore of the Solway Firth. CPU 3 is characterised by a series of deeply indented bays, into which drain four major rivers including the River Cree.

Newton Stewart and Wigtown are the main settlements associated with PU 15, however there is no coastal flood or erosion risk associated with either of these urban areas. Other settlements within PU 15 are identified to be at coastal flood risk, these include Bladnoch, Mains of Baldoon, Carsluith, Palnure and Creetown.

Creetown is a small village located at the mouth of the Moneypool Burn and River Cree as they enter Wigtown Bay and is designated as an Objective Target Area by SEPA. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

Other areas at risk include several isolated properties, including commercial and residential properties and low-lying areas of agricultural land all of which are affected by coastal flooding.

There are environmentally designated sites within PU 15. The River Bladnoch is designated as a SAC, while Carsegowan Moss SAC and SSSI occurs adjacent to the Bishop Burn. The Estuarine area is designated as the Cree Estuary SSSI and Wigtown Local Nature Reserve, while the lower reaches of the Cree are designated as the Lower River Cree SSSI.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, it is estimated that 46 homes and 40 business premises are currently at risk of medium likelihood coastal flooding. By 2080 when the anticipated impact of climate change are considered this will increase to 62 homes and 49 business premises at flood risk.

In addition, approximately 6.8km of road is presently shown to be at flood risk increasing to 9.3km when the anticipated impacts of climate change are considered. The majority of roads affected are minor roads although 0.03km of the A714 is affected at Bladnoch.

841 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Most of the affected area is Improved Grazing. Due to climate change this will increase to 1,013 hectares. The annual average damage associated with flooding is £816,220.

There are four utilities estimated to be at medium likelihood coastal flood risk, increasing to five in the future as the result of climate change. These are all Scottish Water facilities.

There are two community facilities are presently at medium likelihood coastal flood risk with no future increase due to climate change.

There are three cultural heritage assets are at a medium likelihood coastal flood risk, including two Listed Buildings and one Scheduled Monument. The Listed Buildings include Creetown Money Pool Bridge and Old Bridge of Palnure (Category C). The Scheduled Monument identified to be at flood risk is Wigtown Castle.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	46	62
Business Premises	40	49
Utilities	4	5
Community facilities	2	2
Cultural Heritage	3	3
Transport roads (km)	6.8	9.3
Transport rail (km)	0	0
Agricultural Land (ha)	841	1013

### Summary of Coastal Flood Risk in PU 15

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

Creetown is located on a soft coast and the original Dynamic Coast dataset indicated an area of erosion located seawards of the present A75 (NX465588). However due to the presence of salt marsh habitat, there is considerable uncertainty relating to future shoreline change along the coast both here and at Wigtown (NX446557). Consequently the newer Dynamic Coast second phase dataset, no longer includes projected erosion lines for Wigtown Sands, the mouth of the River Bladnoch or the north of Baldoon Sands.

A summary of the erosion risk in PU 15 derived from the Dynamic Coast data is tabulated overleaf. By 2050 it is estimated that three homes and two businesses, along with 0.13km of road will be located within the Erosion Vicinity. By 2100, there will be 12 homes and four business located within the Erosion Vicinity, 0.05km of A75 within the Erosional Area, 0.054km within the Erosion Influence and 0.77km within the Erosion Vicinity.

Assets within both Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	3	0	0	2	0	0	0.13
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	12	0	0	4	0.05	0.054	0.77
<b>Summary of Coastal Erosion Risk in PU 15</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWs position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWs in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
<b>EXISTING COASTAL DEFENCE</b>								
<p>There are some formal coastal defence assets within PU 15, located at Carsluith and Wigtown. A review of the SMP05 report identified other defences including some located within the proximity of Kirkmabreck Quarry and Point Fishery. The rock armour and embankment at Kirkmabreck was described as benefitting the A75 truck road. The continued maintenance of these defences is likely to be necessary to secure the safety of the A75.</p> <p>The SMP05 report also describes the presence of an embankment that runs along the east bank of the Moneypool Burn. The presence of this defence was described as benefitting the adjacent caravan site and Silver Street in Creetown. It is presumed that this is a private defence and owned by the caravan site. Coastal defences surveyed within PU 15 are summarised below.</p>								
<b>SUMMARY OF EXISTING COASTAL DEFENCE</b>								
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area			
Carsluith Frontage (Cass001)	Council	Promenade	4	Maintenance required	Property & minor road			
(Cass002)			2	-				
Wigtown Harbour (Wig001)	Private	Quay	4	Maintenance required	Wigtown Harbour			
Creetown A75	Unknown	Embankment	-	-	-			
<p>*Refer to <a href="#">Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'</a> for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.</p>								

Carsluith (Cass001-Cass002)



Plate 15.1: a. Cass01 & b. Cass02 Promenade

This section of coastal defence fringes the shoreline of Carsluith (NX484550), on the eastern shore of Wigtown Bay adjacent to the Wigtown Bay Local Nature Reserve and Cree Estuary Site of Special Scientific Interest. The presence of this rock armour benefits a single track access road and three properties. The SMP05 noted that without the presence of these defences shorefront properties would be at risk of wave damage, The asset condition survey described this asset as in fair condition. It is overgrown by vegetation along its crest, with displacement and slumping of rocks towards the ends. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence.

Wigtown (Wig001) (Wigtown Quay)

This coastal defence asset is described as a quay located at the seaward extent of the Harbour Road and east of Wigtown (NX438546). The feature is cut into the western bank of the River Bladnoch and also known as Wigtown Quay and can be identified on historical maps (refer to <https://maps.nls.uk/view/74431139>). It is located within the Wigtown Bay Local Nature Reserve and the River Bladnoch Special Area of Conservation. The asset condition survey described this asset as in a poor condition with significant erosion of the crest. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence. The 2002 Coastal Protection Inventory stated that this area was owned by the Wigtown Harbour Trust. In 2017, this feature was up for sale, therefore it is assumed that this feature is still privately owned.

**APPENDIX D – POLICY STATEMENTS**



**Plate 15.2: Wig001 Quay**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	?	?	?	Economic justification for Hold the Line may be marginal, potential environmental & heritage and social impacts are identified.
Managed Realignment	✓	✓	✓	?	Managed Realignment is progressed, although potential social impacts are identified.
No Active Intervention	✓	✓	✓	?	No Active Intervention is progressed, although potential social impacts are identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

**JUSTIFICATION FOR RETENTION / REJECTION**

The SMP05 favoured a selective Hold the Line approach combined with No Active Intervention for the most part.

A selective Hold the Line policy should continue to be implemented as this will continue to benefit properties and the access road located at Carsluith. These defences are in a reasonable condition and so in the short term, they should continue to be sustained. Maintenance works should be restricted to the existing defence footprint as building additional defences could impact on important habitats across the intertidal area. This will allow time for a long-term solution to be developed and funding sought. Over the longer term, further studies are required to decide upon the most suitable management option.

## APPENDIX D – POLICY STATEMENTS

The defence asset at Wigtown Harbour is in poor condition. A Hold the Line policy would ensure the continued integrity of the harbour structures and prevent further erosion. Further assessment is required to identify suitable and sustainable options.

There may be a need for additional works in the future to protect a section of the A75 identified to be at risk of coastal erosion. The A75 runs very close to the shoreline so there will be a requirement to take account of potential impacts on the important intertidal habitats and foreshore habitats. This area of coastline lies within the Cree Estuary SSSI and Wigtown Bay Local Nature Reserve.

There are no formal defences located at Creetown. At this location there is the potential for combined coastal and river flooding. The low-lying area located to the east of the A75 is affected by high likelihood coastal flooding. Coastal flood waters fill up this low lying space, affecting properties located along Silver Street, Harbour Street and Mill Street, and the Caravan Park. Creetown is fronted by saltmarsh and mudflats, Dynamic Coast identified an extensive area of erosion located seawards of the present A75. Managed Realignment could potentially provide opportunities to allow the natural landward expansion of saltmarsh alongside increasing the flood resilience of the A75 in the future. 'Green' estuary edge protection methods and natural defence management should also be considered since erosion protection may be required to the A75 at Carluith and Creetown. The enhancement of saltmarsh to both the west and east side of the River Cree may also improve flood resilience. The identification of sediment accretion within Wigtown Sands and Baldoon Sands may provide an indication that saltmarsh enhancement should be considered. Further detailed studies are required to develop an improved understanding of the consequences of managed realignment and to consider all potential options available for Creetown.

A No Active Intervention approach should be continued for the remainder of the PU 15 shoreline. This will apply to areas where there are limited assets at coastal erosion or flood risk and will allow the shoreline to continue to evolve under natural processes. This approach also supports the environmental designations applicable to this policy unit. However, in common with other areas consideration should be given to allowing the continued maintenance of private defences subject to this being appropriate.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	x	x
Managed Realignment	x	C*	C*
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative  
 \*Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

A Hold the Line policy can only be sustained over the short term by the continued maintenance of existing formal defence assets. However this will allow for longer term solutions to be considered as it is likely that the formal defence assets that currently benefit Wigtown and Carluith will need to be improved to address sea level rise. Justification for significant defence asset improvement will be challenging due to the limited assets at risk.

Managed Realignment approaches may improve the overall flood resilience of PU 15 and allow for the natural landward expansion of saltmarsh. However an improved understanding of the coastal processes

## APPENDIX D – POLICY STATEMENTS

is required to assess the feasibility of this approach. Managed Realignment should however be considered over the medium and long-term.

Considering the extensive salt marsh habitat associated with this policy unit, a general policy of No Active Intervention is the preferred environmental option. Thus monitoring of the evolution of the coastline should be implemented and where no assets are at risk, a policy of No Active Intervention continued. In this way appropriate maintenance of private defences can be accommodated, subject to the appropriate consent.

Any future works will depend upon funding being available to take them forward and should be subject to more detailed scheme level appraisal of options and the granting of appropriate consents and permissions.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 15 and across all epochs, as shown in Figure 15.2. This will allow areas of intertidal habitat including saltmarsh to function naturally.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

During public and stakeholder engagement, undertaken through March and April 2021, NatureScot noted that the extensive saltmarsh of the Cree Estuary SSSI provides a natural coastal defence. Since the existence of much of the saltmarsh relies on shelter provided by 19th century breakwaters, it was recommended that there should be further study relating to the function and status of these breakwaters. The 'ideal' principal objective for the Cree Estuary SSSI is to maintain and where possible maximise natural processes, however NatureScot have recommended the interdependence between protected landforms and habitats, historic structures and flood and erosion risk should be explicitly considered in the development of a management approach for PU 15.

NatureScot also recommended that the proposed Managed Realignment policy should be clarified, the 'Justification' text presented for public / stakeholder engagement strongly implied Managed Realignment should only be considered at Creetown, whereas the policy table and the Summary text implied it could be applied more widely.

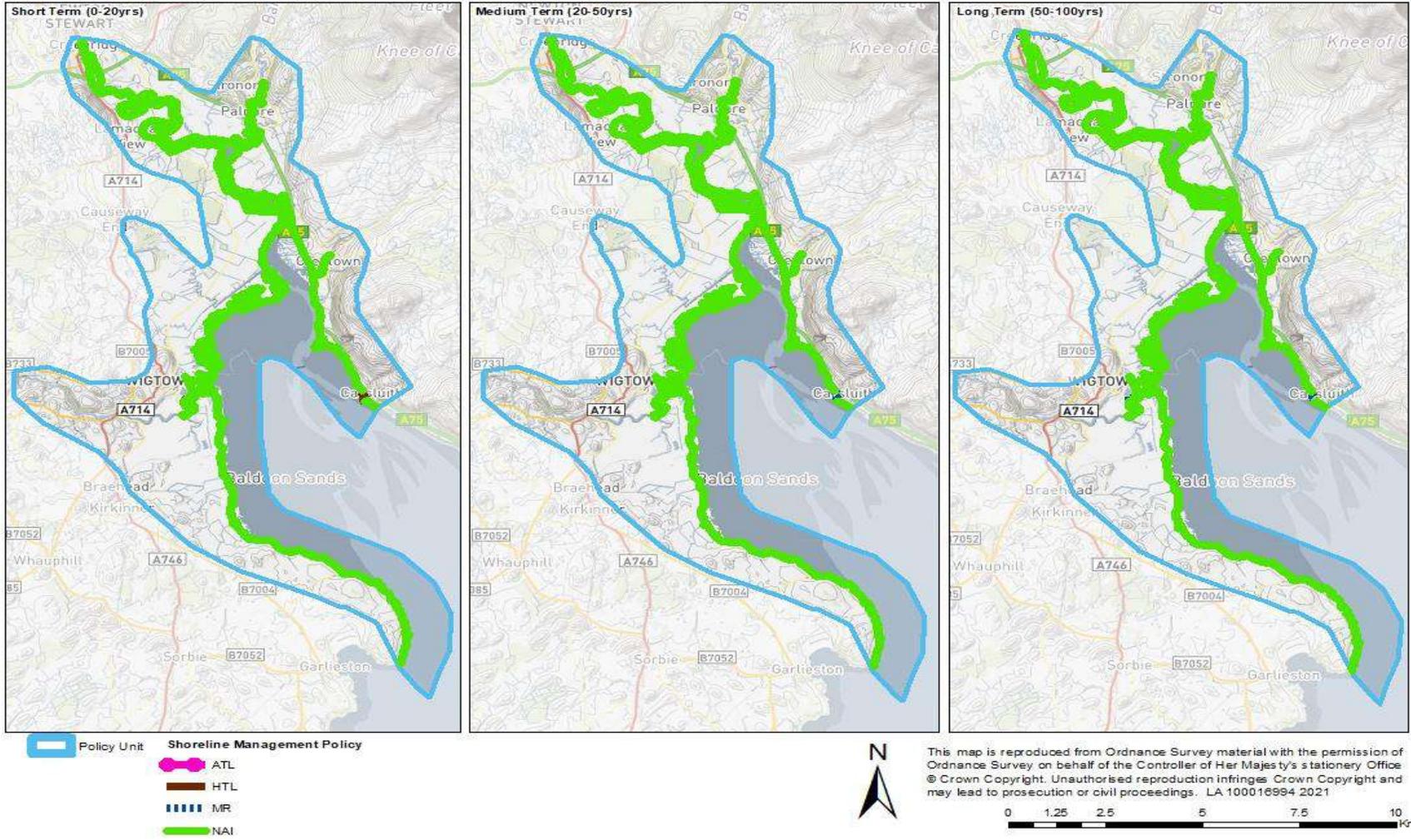
The identification of specific managed realignment options goes beyond the scope of the SMP, but the need for further study and clarification of where / what this might involve should be taken forward as an action for the Action Plan.

### STAKEHOLDER ENGAGEMENT OUTCOME

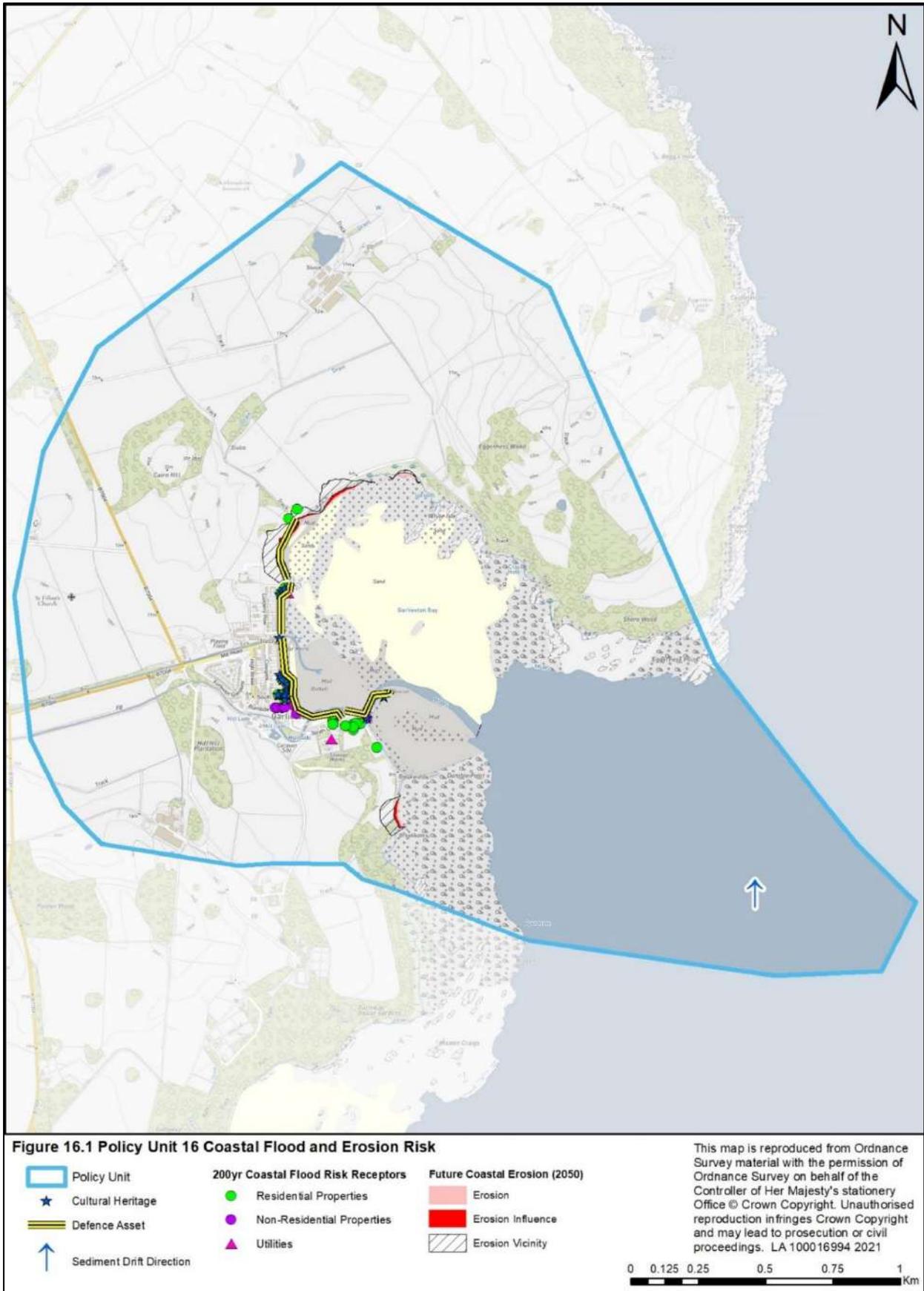
The Preferred Policy, predominantly No Active Intervention with very localised Hold the Line/Managed Realignment at Wigtown and Carsluith as presented during the stakeholder engagement was not updated. However, the need for further study and clarification of what Managed Realignment might entail was taken forward as an action for inclusion in the Action Plan. Figure 15.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 15.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 15.2 Policy Unit 15 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D4.5 PU 16 – Garlieston



## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT
<p>PU 16 extends from Eggerness Point (NX493465) to Ringan Point (NX480456) and encompasses Garlieston Bay (NX478468), which is a crescentic bay located on the outer western part of Wigtown Bay. Garlieston is located within CPU 3. The shoreline at the village of Garlieston is described as artificial and includes the tidal harbour, at the head of the Bay the shoreline is described as a soft coastline.</p> <p>The remainder of the shoreline of Garlieston Bay is mainly rocky and indented. Much of Garlieston Bay is exposed at low tide, revealing a mixture of sand and gravel, with the upper foreshore consisting of courser material including gravels. There is a dominance of mud and sand in the south of the bay and within the harbour area. There are no designated environmental sites within this policy unit, although there are scheduled national monuments and heritage assets located here.</p> <p>Garlieston is designated as an Objective Target Area by SEPA. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.</p>
FLOOD RISK
<p>Based on SEPA strategic flood mapping data, it is estimated that 36 homes and 11 business premises are currently at risk of medium likelihood coastal flooding. When predicted potential changes due to climate change are considered, this increased to 44 homes with no further business premises estimated to be at flood risk.</p> <p>In addition, approximately 2.2km of road is presently depicted to be at flood risk increasing to 2.5km, when the anticipated impacts of climate change are considered. The roads affected are classed as minor roads.</p> <p>8 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 86% of the affected area is Arable and Horticulture, with 14% of Improved Grazing. Due to climate change this will increase to 11 hectares. The annual average damage associated with flooding is £261,006.</p> <p>There are three utilities estimated to be at medium likelihood coastal flood risk, with no expected increase in the future as the result of climate change. These are all Scottish Water facilities.</p> <p>There is one community facility the 'Village Hall' estimated to be at coastal flood risk. No further community facilities are expected to be impacted by climate change.</p> <p>There are 18 cultural heritage assets at flood risk, including Listed Buildings and a Garden &amp; Designed Landscape (Galloway House). An additional five cultural heritage assets will be affected by future medium likelihood coastal flooding.</p> <p>The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.</p>

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Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	36	44
Business Premises	11	11
Utilities	3	3
Community facilities	1	1
Cultural Heritage	18	23
Transport roads (km)	2.2	2.5
Transport rail (km)	0	0
Agricultural Land (ha)	8	11

### Summary of Coastal Flood Risk in PU 16

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

Dynamic Coast indicates that parts of the shoreline of PU 16 are at risk of coastal erosion, although there are also areas of accretion. The most active areas of erosion are associated with the head of Garlieston Bay. However Dynamic Coast estimates that by 2070 the shoreline of PU 16 will be predominately erosional, with sections of this shoreline having receded by up to 27m by that time.

It is estimated that one home will be located within Erosion Vicinity by 2050 and by 2100 this will increase to two homes. Similarly, by 2050 a 0.02km stretch of road will be located within the Erosional Area, increasing to 0.66km by 2100. This includes sections of minor access road located to the north of the village.

Assets within both Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/webmap.html> for further information.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	1	0	0	0	0.02	0.123	0.31
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	2	0	0	0	0.66	0.08	0.06
<b>Summary of Coastal Erosion Risk in PU 16</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
<b>EXISTING COASTAL DEFENCE</b>								
<p>Garlieston Bay is relatively exposed and this area is potentially affected by wave overtopping.</p> <p>Coastal defence assets fringe the shoreline of the village, with a promenade and quay located to the south-east and towards its most seaward extent (NX478469). There is also a discontinuous wall fronting the village for about 1km and terminating towards the north of the village. Towards the north of the town there are agricultural fields that slope towards a minor coastal road, this marks the most northerly extent of the defences (NX478469).</p>								
<b>SUMMARY OF EXISTING COASTAL DEFENCE</b>								
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area			
Garlieston Quayside (Gair001)	Council	Promenade	4	Continued monitoring & maintenance required	Quayside			
(Gair002)		Quay						
Garlieston South-east (Gair003)	Council (Roads)	Wall	3	Maintenance required	Road, recreational space and properties			
(Gair004)								
Garlieston South-Crescent (Gair005)	Private	Wall	3	Maintenance required	Road & property			
Garlieston North-Crescent (Gair006)	Council (Roads)	Wall	3	Maintenance required	Road & property			

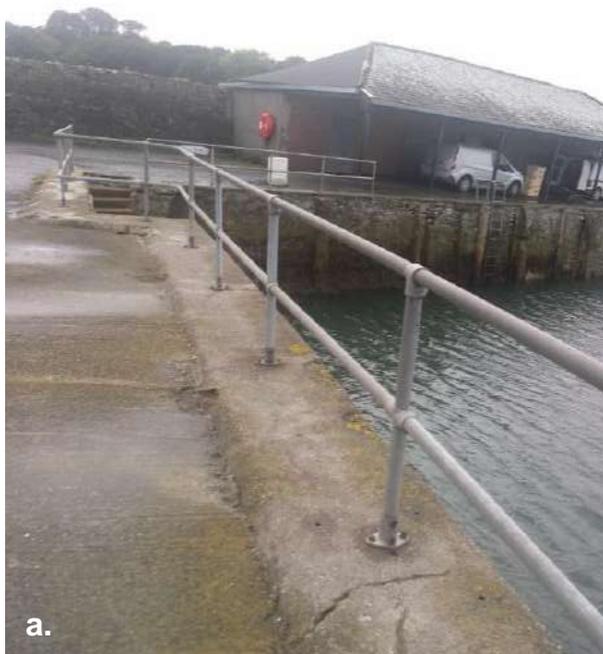
**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
(Gair007)	Council (Roads)	Wall	4	Maintenance required	Road & property
Garlieston Shore Road (Gair008)	Council (Roads)	Wall	3	Maintenance required	Road & property

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Garlieston Quayside (Gair001-002)**

Garlieston Quayside includes a Quay and Promenade, these coastal defence assets are located to the south-east of the village (NX482463). The spatial extent of these coastal defences is delineated by a slipway at (NX479462). The presence of these assets benefits Garlieston harbour and the quayside area. Garlieston Harbour includes Listed Buildings (Category B) and the adjacent Garden and Designed Landscape (Galloway House). The quay provides some shelter from waves. The asset condition survey described this asset as in a poor condition. There is evidence of cracking and voids along the exposed face with spalling and slumping. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The council hold a Harbour Empowerment Order for the harbour area, allowing the council to maintain and manage this harbour.



**Plate 16.1: a. Gair001 (Promenade) & b. Gair002 (Quay)**

**Garlieston South-East (Gair003-004)**

Garlieston south-east coastal defence assets are situated to the west of Garlieston Quayside (NX478461). This includes an area of promenade with gabions at its western extent. The presence of these defence assets benefit a minor road, property and recreational space. There are also several Listed Buildings (Category B) located landwards of these defences. The asset condition survey described these assets as in fair condition, since some maintenance of the gabions is required. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to these defences as Council owned (roads).



**Plate 16.2: a. Gair003 (Promenade) & b. Gair004 (Wall)**

**Garlieston South-Crescent (Gair005)**

This coastal wall lines the shoreline of Garlieston along the South Crescent frontage. The presence of this wall benefits the adjacent shore road and properties located landwards. The asset condition survey described this asset as in fair condition, with some vegetation growth along its face. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to these defences as privately owned.



**Plate 16.3: Gair005 (Wall)**

**3. [Garlieston North-Crescent \(Gair006-007\)](#)**

This coastal wall fringes the shoreline of Garlieston along the North Crescent frontage. The presence of this wall benefits the adjacent shore road and properties located landwards. There are also several Listed Buildings mainly (Category B) located here. The asset condition survey described this asset as in fair condition, with some vegetation growth along its face, and some large cracks and holes. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to these defences as Council owned (roads).



**Plate16.4: a. Gair006 (Wall) & b. Gair007 (Wall)**

**4. [Garlieston Shore Road \(Gair008\)](#)**

This coastal wall is located along the shoreline to the north of Garlieston adjacent a 0.25km stretch of road. The presence of this coastal wall benefits the adjacent shore road and agricultural land. The asset condition survey described this asset as in fair condition, with some vegetation growth through the wall, some missing joint material and holes. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to these defences as Council owned (roads).

**APPENDIX D – POLICY STATEMENTS**



**Plate 16.5: Coastal Defence Asset Gair008 (Wall)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✓	✓	✓	Hold the Line is progressed, although the economic justification is likely to be marginal. There are potential environmental & heritage and social impacts identified.
Managed Realignment	✓	?	✓	!	Managed Realignment is progressed, although there are significant social impact identified.
No Active Intervention	✓	✓	✓	✓	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood / erosion risk management measures.

- x - Reject
- ✓ - Progress
- ? - Progress, however potential for impacts identified
- ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

The SMP05 recommended a Hold the Line approach, to encourage the proactive maintenance of coastal defence assets.

## APPENDIX D – POLICY STATEMENTS

Hold the Line can be implemented over the short to medium term by maintaining and upgrading the current coastal defence assets. Proactive maintenance and repairs should be undertaken as necessary, although consultation with Historic Environment Scotland is required, due to potential impacts on Heritage and landscape features, particularly at Garlieston Quayside (Gair001-002). The continued monitoring and maintenance of the remaining defence assets would help manage risk to the village and cultural heritage features located within the village. This approach would continue the present policy of maintaining and repairing the defences as necessary. The future economic viability of this policy is questionable and further studies are needed to identify the most appropriate and justifiable option over the longer term. Dynamic Coast has indicated that the shoreline here has been generally stable since the 1890's, possibly due to the presence of defences.

There may be some opportunity within PU 16 for mud / sandflat enhancement within this sheltered bay area. This will require a detailed investigation to identify potential options including target locations and assess the potential impact this approach could have upon coastal processes and socio-economic factors.

The current proactive maintenance and monitoring of existing coastal defence assets will allow time for alternative Managed Realignment adaptation approaches to be investigated further and implemented.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	C
Managed Realignment	x	A	A
No Active Intervention	C*	C*	C*

x - Reject

C – Consider

A – Alternative

\*~ Applies to sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures.

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 16 is to continue the existing Hold the Line policy across all epochs, where this is justified. Over the longer term, it is likely that the coastal defence assets that currently benefit Garlieston will need to be improved to address sea level rise. The justification for defence asset improvement is likely to be challenging due to the limited assets at risk.

Therefore over the medium and longer term Managed Realignment may be a more appropriate policy to improve the overall flood resilience of PU 16. Consequently, Managed Realignment approaches such as the enhancement of mud / sandflats, accumulation of dunes and gravel ridges landward of the present shoreline should be considered. A detailed study of coastal processes will be required to consider the possible options available.

It should be noted that No Active Intervention should be applied to sections of the undeveloped shoreline, where there is no need to maintain existing flood and / or erosion risk management measures.

Any future works will depend upon funding being available to take them forward and should be subject to more detailed scheme level appraisal of options and the granting of appropriate consents and permissions.

The preferred policy of Hold the Line should be applied to the developed coastal extent of PU 16 and across all epochs, as shown in Figure 16.2. As an alternative Managed Realignment should be investigated for the medium and long term. Elsewhere a policy of No Active Intervention should be applied.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

## APPENDIX D – POLICY STATEMENTS

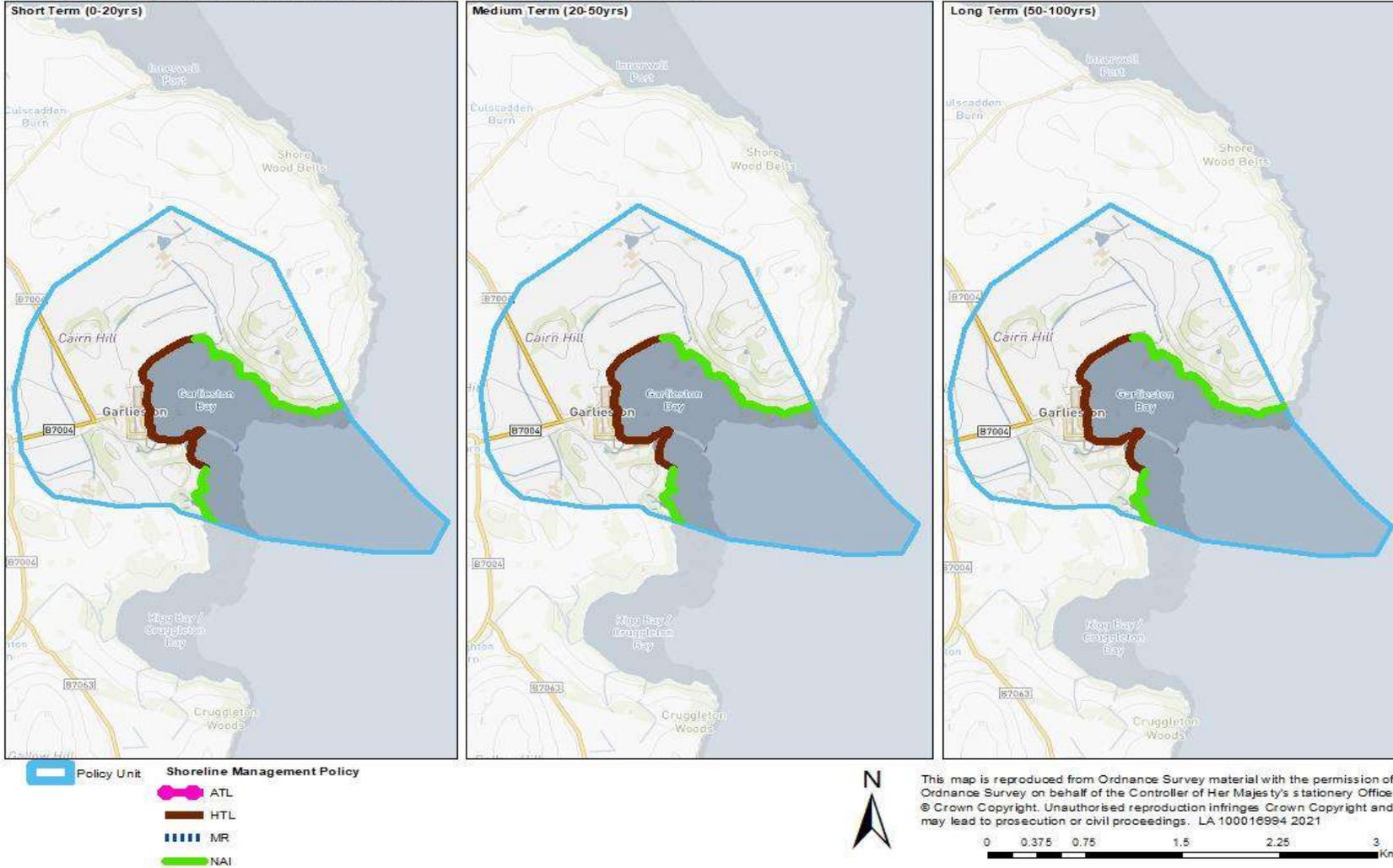
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, this did not change the Preferred Policy.

### STAKEHOLDER ENGAGEMENT OUTCOME

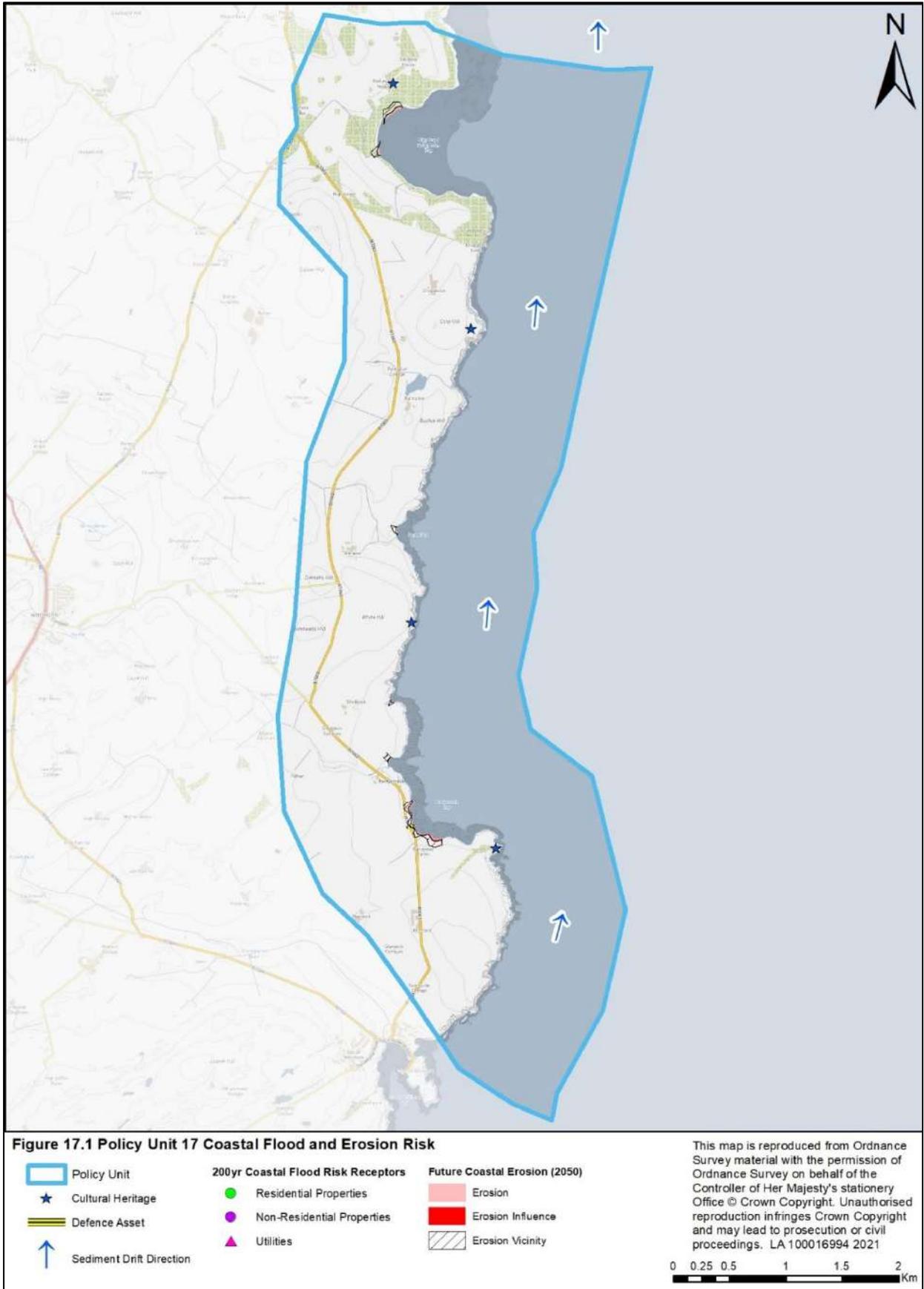
The 'Preferred Policy' of Hold the Line over all epochs as presented during the stakeholder engagement was not updated. A refinement was however added to the Preferred Policy for PU 16, by clarifying the adoption of No Active Intervention for sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures. Figure 16.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 16.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 16.2 Policy Unit 16 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D4.6 PU 17 – Garlieston to Isle of Whithorn



## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 17 extends from Ringan Point at the southern end of Garlieston Bay (NX480456) to north of the Isle of Whithorn (NX482362).

This shoreline generally faces east on to Wigtown Bay and is located within CPU 3 which encompasses the entire shoreline of Wigtown Bay. The shoreline is described as hard and mixed, with any areas of soft erodible sediment forming small indented bays e.g. Rigg or Craggleton Bay. Elsewhere there are areas of rocky cliff fronted by a low rock platform. This area is largely rural and the hinterland is dominated by large agricultural holdings.

There are no designated environmental sites within this policy unit.

### FLOOD RISK

The SEPA strategic flood mapping does not show any present day medium likelihood coastal flood risk to homes or businesses within PU 17.

Similarly there is no present day risk to roads, however when climate change impacts are considered approximately 0.07km of B class (B7063) road is indicated to be at risk of future medium likelihood coastal flooding.

Three hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 68% of the affected area is Improved Grazing. Due to climate change this will increase to four hectares. The annual average damage associated with flooding is £2,123.

Also there are four cultural heritage features at a medium likelihood coastal flood risk, including three scheduled monuments (Craggleton Castle, Dinnian and Cairnhead Forts) and one Garden and Designed Landscape (Galloway House).

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	4	4
Transport roads (km)	0	0.13
Transport rail (km)	0	0
Agricultural Land (ha)	3	4

#### Summary of Coastal Flood Risk in PU 17

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

**APPENDIX D – POLICY STATEMENTS**

**EROSION RISK**

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown. However the Dynamic Coast data indicates that the shoreline of PU 17 is not significantly at risk of coastal erosion.

Dynamic Coast indicates that within PU 17 there are areas of accretion as well as erosion, with sediment accretion most notable along the head of Rigg Bay, and areas of erosion to the south of this pocket beach. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 17 will have advanced seawards by up to 3m whilst other area will have receded landwards by up to 3m. However, Dynamic Coast indicates that by 2060, this shoreline will be predominately erosional, anticipated to have receded landwards by up to 9m, and by 2100 this could increase to 12m.

There are no homes or businesses identified to be at risk of erosion. Small sections of road are situated within the Erosion Vicinity as is approximately a 2ha area of Garden and Designated Landscapes and about 1ha of Green Space. Assets located within the Erosion Vicinity are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0.012
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0.36

**Summary of Coastal Erosion Risk in PU 17**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

**EXISTING COASTAL DEFENCE**

There is a coastal defence within PU 17, a seawall that currently protects a section of the B7063 at Portyerrock Bay (NX478384) located towards the southern limit of this policy unit. SMP05 described several other relict defence features, including an old seawall at Rigg Bay that is currently detached from the shoreline, at Port Allen there is an old landing place and at Miller's port there is sea access to a relict mill. These defences are considered as relict features and do not benefit any assets.

**APPENDIX D – POLICY STATEMENTS**

SUMMARY OF EXISTING COASTAL DEFENCE					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Portyerrock (Whit006)	Council (Roads)	Wall	3	Maintenance required	B7063 at Portyerrock
<p>*Refer to <a href="#">Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'</a> for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.</p> <p><b><a href="#">Portyerrock (Whit006)</a></b></p> <p>This wall protects a section of coastal road (B7063) that runs adjacent to the shoreline. The presence of this wall benefits the road that is located landwards of a rocky shore.</p> <p>The asset condition survey described this asset as in fair condition, due to some minor cracking and spalling, and vegetation growth. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. The 2002 Coast Protection Inventory noted that this coastal defence is owned by the council.</p> <div> </div> <p style="text-align: center;"><b>Plate 17.1 Whit006 (Wall)</b></p>					

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No risk identified therefore no justification for Hold the Line in this policy unit.
Managed Realignment	x				Very limited scope for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	✓	No Active Intervention, will allow this predominantly hard coastline to evolve naturally.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
SMP05 recommended a No Active Intervention approach, with selective limited intervention applied to the coastal defence asset located at Portyerrack. The continuation of this approach over all epochs is recommended. Natural processes should be allowed to continue within this policy unit as there are limited assets at risk. The maintenance of the coastal defence (Whit006) should continue as and when required, with maintenance undertaken if the road is at risk.					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	x	x	x		
Hold the Line	C*	C*	x		
Managed Realignment	x	A*	C*		
No Active Intervention	C	C	C		
x - Reject C – Consider A – Alternative *Localised					
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY					
A general approach of No Active Intervention is proposed for PU 17 due to the low coastal flood and erosion risk associated with this policy unit. The structure currently retaining a section of the B7063					

## APPENDIX D – POLICY STATEMENTS

should be maintained. Continued monitoring of the risk to this road and further consideration of the future viability of this route may be required in the long-term.

Consultation with Historic Environment Scotland is recommended, due to potential impacts on heritage and landscape features associated with this policy unit.

It is important to note that recommended activities might be subject to funding and resources available to take them forward.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 17 for all epochs, as shown in Figure 17.2, as this will allow the coastline to function naturally.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

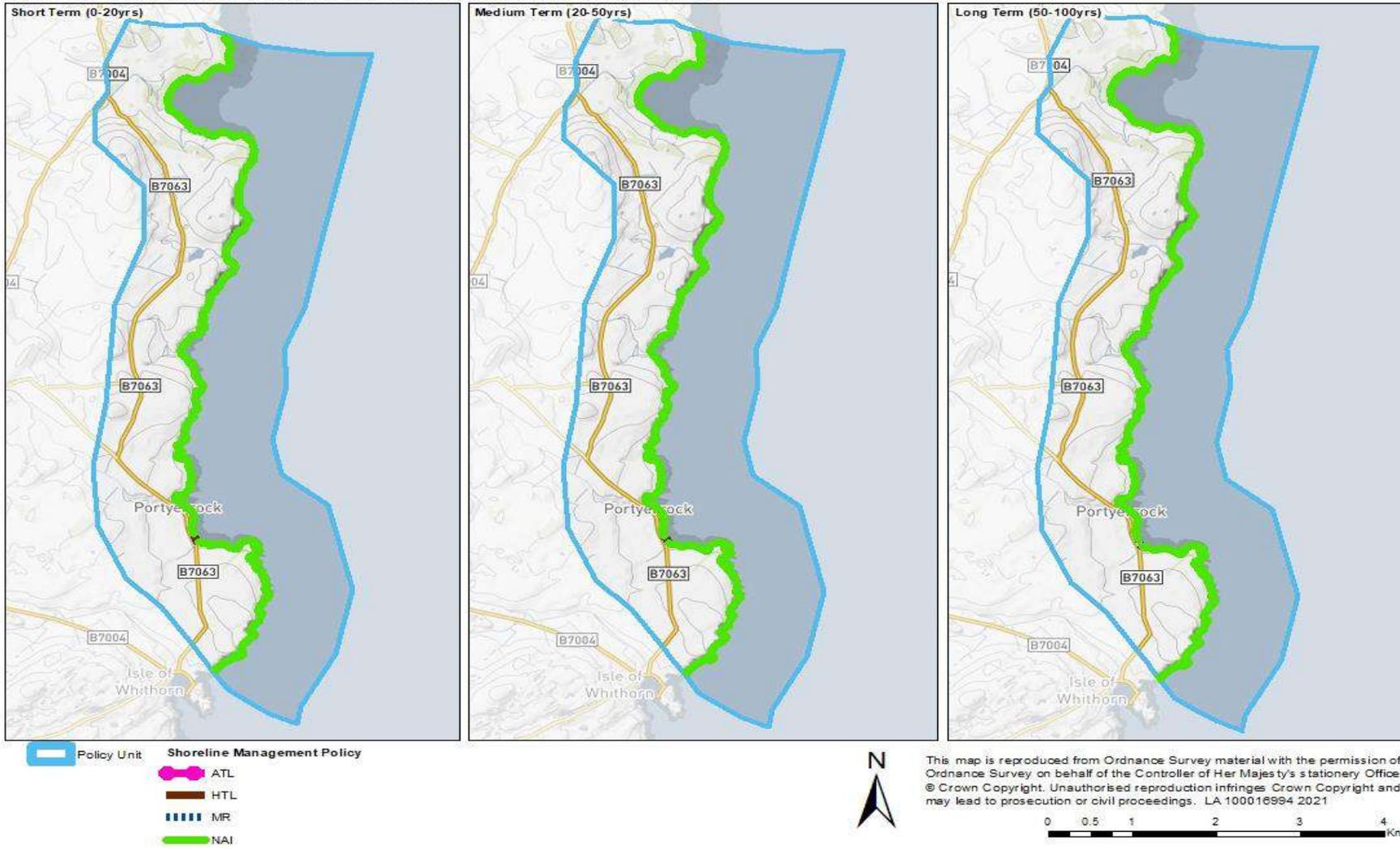
No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment at the B7063 as presented during the stakeholder engagement was not updated. Figure 17.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 17.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 17.2 Policy Unit 17 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D4.7 PU 18 – Isle of Whithorn

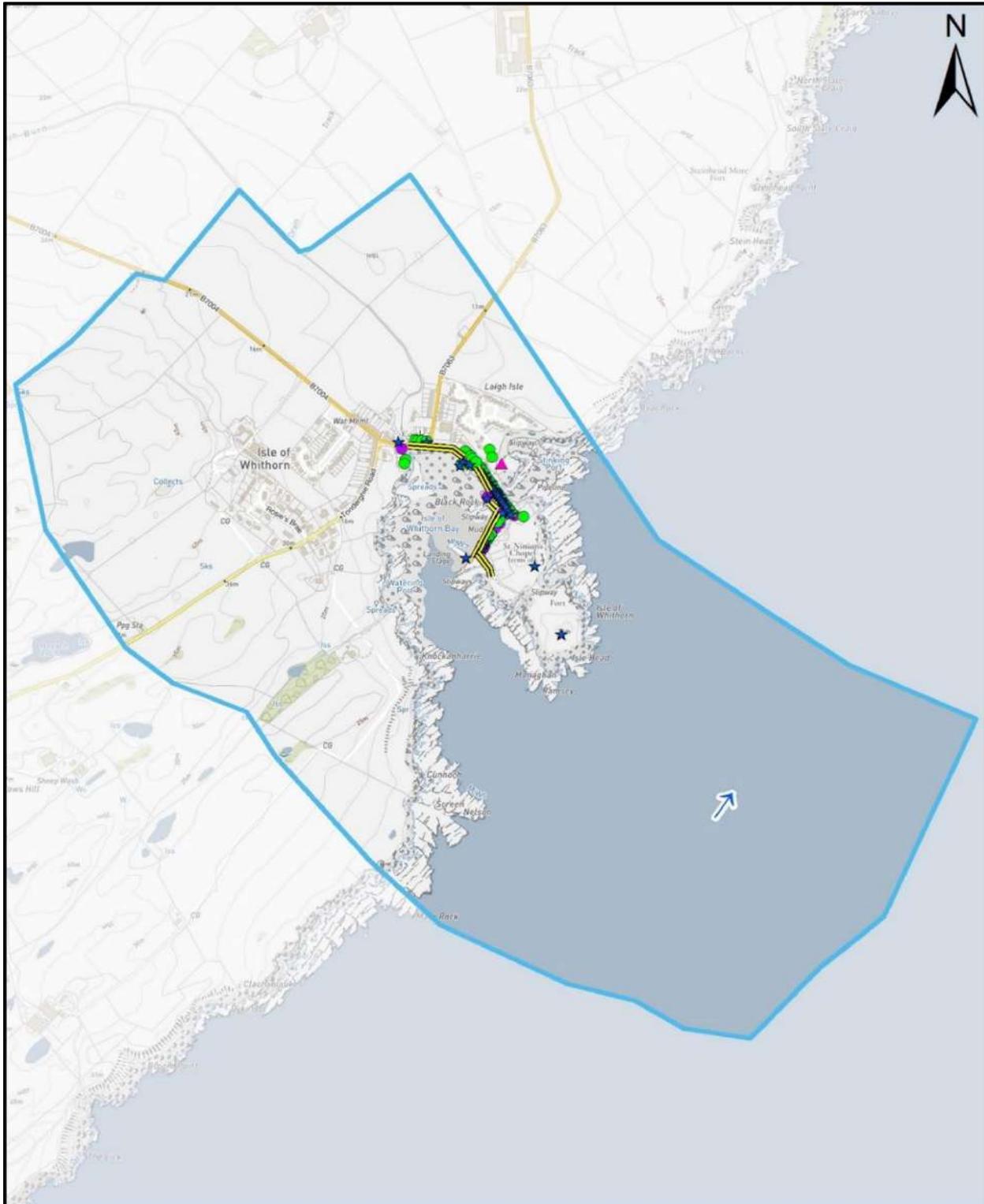
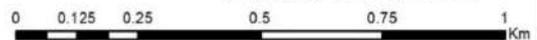


Figure 18.1 Policy Unit 18 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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**DESCRIPTION OF POLICY UNIT**

PU 18 relates to the frontage of Isle of Whithorn village (NX478362) located on the coast north east of Burrow Head at the tip of the Machars peninsula in Galloway (NX475354). Isle of Whithorn is located within an indented bay which has been manipulated to form a harbour.

PU 18 is located within CPU 3 which is characterised by a series of deeply indented bays, with Isle of Whithorn located close to the western extent of this CPU. The eastern Isle of Whithorn shoreline is described as artificial, since it includes the harbour area and the majority of properties. There is an area of soft coast located at the head of the bay, whereas the rest of the bay is described as mixed and hard shoreline.

The majority of properties are located to the north and east sides of the bay. Isle of Whithorn is exposed to southerly winds and the likely high energy wave climate has potential to exacerbate coastal flooding at this location through wave overtopping.

There are environmentally designated sites within PU 18. An area of the shoreline in the inner bay, south of the current defences is designated as the Isle of Whithorn Bay SSSI due to the presence of geological features of importance, while Burrow Head, situated to the south of Isle of Whithorn is designated as an SAC and SSSI.

Isle of Whithorn is designated as an Objective Target Area by SEPA. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, it is estimated that 50 homes and 13 business premises are currently at risk of medium likelihood coastal flooding. When predicted potential changes due to climate change are considered, this increases to 54 homes, with no additional business premises estimated to be at flood risk.

In addition, approximately 0.6km of road is presently shown to be at flood risk increasing to 0.7km, when to the anticipated impacts of climate change are considered. The B7063, Main Street and Harbour Row are the main roads affected.

0.8 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 59% of the affected area is Arable and Horticulture. Due to climate change this will increase to 1.7 hectares. The annual average damage associated with flooding is £248,389.

There is also one utility shown to be at coastal flood risk and 29 cultural heritage features, including 27 Listed Buildings located along Main Street the Harbour and Harbour area, as well as the Parish Church. There are also two Scheduled Monuments, including St Ninian’s Chapel and Isle Head Fort. In the future, it is anticipated that 30 cultural heritage features will be at coastal flood risk.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	50	54
Business Premises	13	13
Utilities	1	1
Community facilities	0	0
Cultural Heritage	29	30
Transport roads (km)	0.6	0.7
Transport rail (km)	0	0
Agricultural Land (ha)	0.8	1.7

### Summary of Coastal Flood Risk in PU 18

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change projections are based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

However, in the case of PU 18, there are no homes, businesses or roads indicated to be at risk of erosion, presently or in the future. Refer to <http://dynamiccoast.com/webmap.html> for further information.

### EXISTING COASTAL DEFENCE

There are coastal defences associated with PU 18 including a wall and a quay. These coastal defence assets are summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Main Street (West) (Whit001)	Council (Roads)	Wall	3	Maintenance required	Main Street Road & property
Main Street (East) (Whit002)	Council (Roads)	Wall	3	Maintenance required	Main Street Road & property
(Whit003)					

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Harbour Row (Whit004)	Council	Quay	4	Continued monitoring & maintenance required	Harbour Row Road & property
Harbour (Whit005)	Council	Wall	4	Continued monitoring & maintenance required	Harbour & Road

\*Refer to Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P' for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Main Street West (Whit001)**

To the west of Main Street, Isle of Whithorn, a 0.15km long masonry wall lines the shoreline adjacent to the road. This wall starts close to the outlet of the Pouton Burn (NX476365) and extends east towards Sea Breeze House (NX477365). The presence of this coastal asset benefits the western end of Main Street and property. The asset condition survey described this asset as in fair condition, although there is evidence of minor cracking along the landward face with slumping. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. This asset is fronted by a steep beach of sand and gravel. The 2002 Coastal Protection Inventory referred to these defences as a sea wall, this asset is council owned.



**Plate18.1: Whit001 (Wall)**

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### [Harbour Row \(Whit002 & Whit003\)](#)

To the east of Main Street, Isle of Whithorn, a 0.07km long masonry wall lines the shoreline adjacent to the road. This wall starts close to the Listed Building 'Captains Garden' (NX478364) and extends east towards the Church (NX478363). The presence of this coastal defence asset benefits the eastern end of Main Street and properties including several Listed Buildings. The asset condition survey described this asset as in fair condition with evidence of minor cracking along the landward face and slumping. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to these defences as a sea wall, this asset is council owned.



Plate18.2: Whit002 (Wall)

### [Harbour Row & Quay \(Whit004\)](#)

The coastal defence assets located along Harbour Row define the extent of the Isle of Whithorn Harbour. There are several Listed Buildings located landward of the quay. The asset condition survey described this asset as being in poor condition with evidence of severe slumping of the Quay face. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The SMP05 study described how this defence was exposed to considerable wave impact. The precursor study also warned that if this feature was allowed to fall into disrepair the harbour would become unstable and the town frontage would be affected by wave overtopping. The foreshore would also be eroded resulting on the loss of the sand as this feature also acts as a breakwater. The 2002 Coastal Protection Inventory referred to these defences as a sea wall, this asset is council owned.



Plate18.3: Whit004 (Quay)

**Harbour (Whit005) Wall**

This masonry wall is located to the east of the harbour area (NX478362). The shoreline adjacent to the wall is described as a steep cliff. The gabion baskets located here are in poor condition, there is also severe cracking of the wall and minor vegetation growth. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The SMP05 policy stated that the gabion works are not crucial to the integrity of the defences. The access road to a car park and access to the remains of St Ninian’s Chapel are protected by this asset. This location is known to be affected by wave overtopping. The 2002 Coastal Protection Inventory referred to these defences as a sea wall, and to be council owned. The Council hold a Harbour Revision Order for the Isle of Whithorn Harbour that permits the Council to legally improve, maintain and manage the harbour.



Plate18.4: Whit005 (Wall)

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REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	?	?	?	Given the proximity of properties to the shoreline Hold the Line is the only viable short term measure although economic justification may be marginal. No potential environmental & heritage and social impacts are identified.
Managed Realignment	✓	?	?	!	Managed Realignment is probably the only sustainable long term option although significant potential social impacts are identified.
No Active Intervention	✓	✓	✓	✓	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood / erosion risk management measures.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

**JUSTIFICATION FOR RETENTION / REJECTION**

SMP05 suggested a Hold the Line policy for PU 18, over all epochs.

Hold the Line over the short term can be implemented by maintaining and upgrading the current coastal defence assets. However, it is unlikely that construction of major new defences could be economically justified hence this approach is unlikely to sustain protection indefinitely. Regardless proactive maintenance and repairs should be undertaken as necessary. Consultation with Historic Environment Scotland is recommended, due to potential impacts on Heritage and landscape features, particularly as some of the defence assets are also Listed Structures. Further studies are recommended to determine the most sustainable option over the longer term.

There may be some opportunity for softer management measures to be incorporated within a Hold the Line policy for PU 18, particularly in terms of gravel beach restoration and enhancement west and east of Main Street. Such an approach could provide some enhanced flood resilience, particularly if wave overtopping is an issue as gravel beach restoration and improving the beach profile may dissipate wave energy. This will require a detailed investigation, and consultation with NatureScot due to potential impact upon the Isle of Whithorn Bay Site of Special Scientific interest located along the western shore.

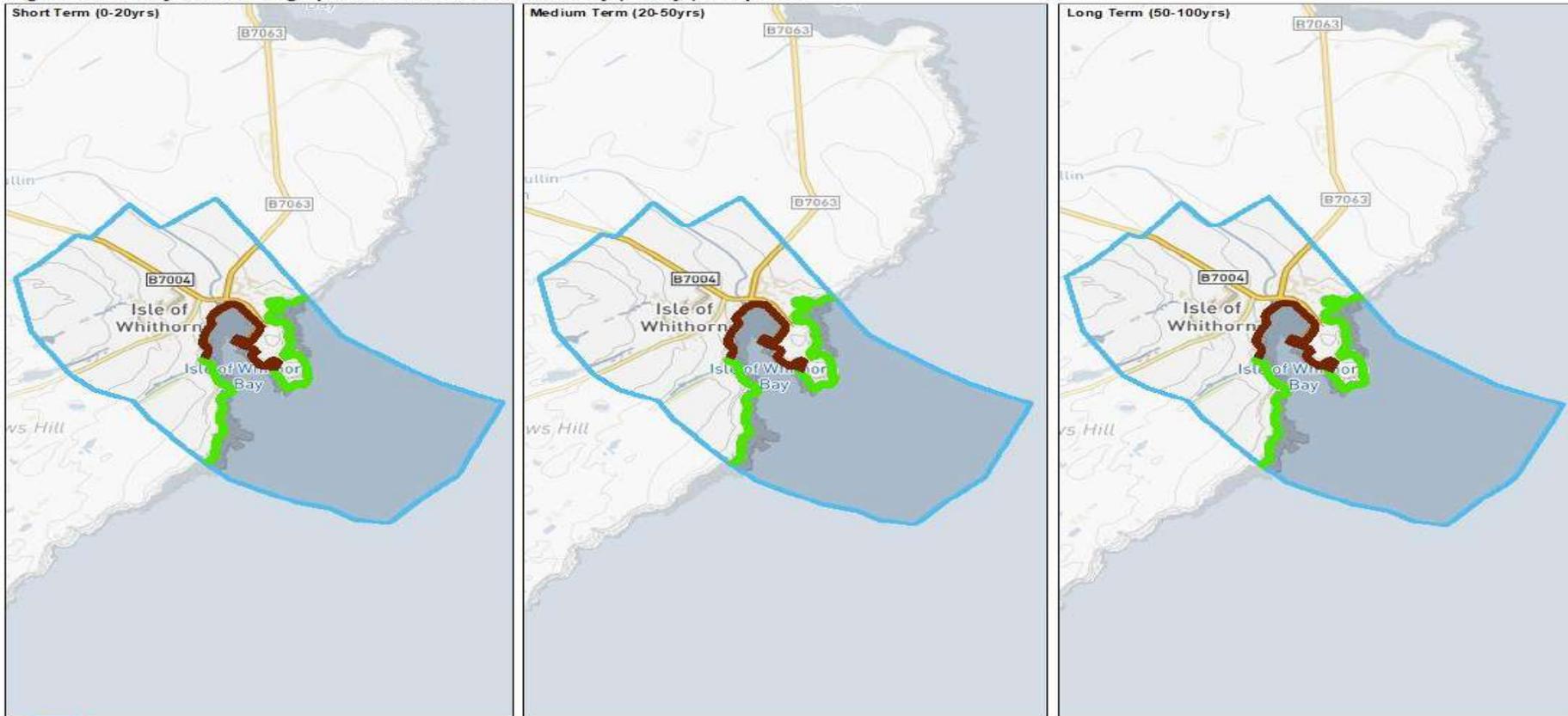
A policy of Managed Realignment over the longer term is likely to be more sustainable than maintaining flood defence for this area. In the longer term, relocation may be the only viable option. Managed Realignment however has potential to lead to significant social impacts relating to damage to or loss of properties. Continuation of the current maintenance and upgrading of existing defences will allow time for Managed Realignment adaptation approaches to be investigated further and considered for the future.

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	C
Managed Realignment	x	A	A
No Active Intervention	C*	C*	C*
<p>x - Reject            C – Consider            A – Alternative            *~ Applies to sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures.</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred strategic approach for PU 18 is to continue with the existing Hold the Line policy where it is required and across all epochs for as long as it is possible and justifiable to do so. Over the longer term, it is likely that the coastal defence assets that currently benefit Isle of Whithorn will need to be improved to address sea level rise. Defence asset improvement is likely to become technically challenging and difficult to justify economically in the future due to the limited number of assets at risk.</p> <p>A study undertaken by the University of Strathclyde has previously considered a tidal barrage as a means of risk management for the Isle of Whithorn (Refer to <a href="#">Tidal Barrage</a>). This approach was identified as potentially being technically feasible, but its estimated cost of £40million is likely to make it economically unviable.</p> <p>Over the medium and longer term Managed Realignment approaches may improve the overall flood resilience of PU 18. However, it will be necessary to undertake a detailed study to consider and evaluate all the possible options available before this can be confirmed.</p> <p>Any future works will depend upon funding being available to take them forward and should be subject to more detailed scheme level appraisal of options and the granting of appropriate consents and permissions.</p> <p>It should be noted that No Active Intervention should be applied to sections of the undeveloped shoreline, where there is no need to maintain existing flood and / or erosion risk management measures.</p> <p>The preferred policy of Hold the Line should be applied to the extent of the developed coastline of PU18 and across all epochs, as shown in Figure 18.2. Alternative Managed Realignment policies should be considered over the medium and longer terms.</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p> <p>The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, this has not changed the preferred policy in PU 18.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>The 'Preferred Policy' of Hold the Line remains, however this was refined to include a recommendation for No Active Intervention for sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures. As an alternative policy, Managed Realignment should also be considered over the medium and long term.</p>			

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 18.2 Policy Unit 18 Geographical Extent of Preferred Policy (0-100yr) All Epochs



- Policy Unit
- ATL
- HTL
- MR
- NAI



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## 5 COASTAL PROCESS UNIT 4

CPU 4 of the SMP, Luce Bay, extends from Burrow Head in the east to the Mull of Galloway in the west. There are eight policy units within CPU 4 for which the relevant management policies are identified in the following sub-sections.

D5.1 PU 19 – Isle of Whithorn to Barshalloch Point

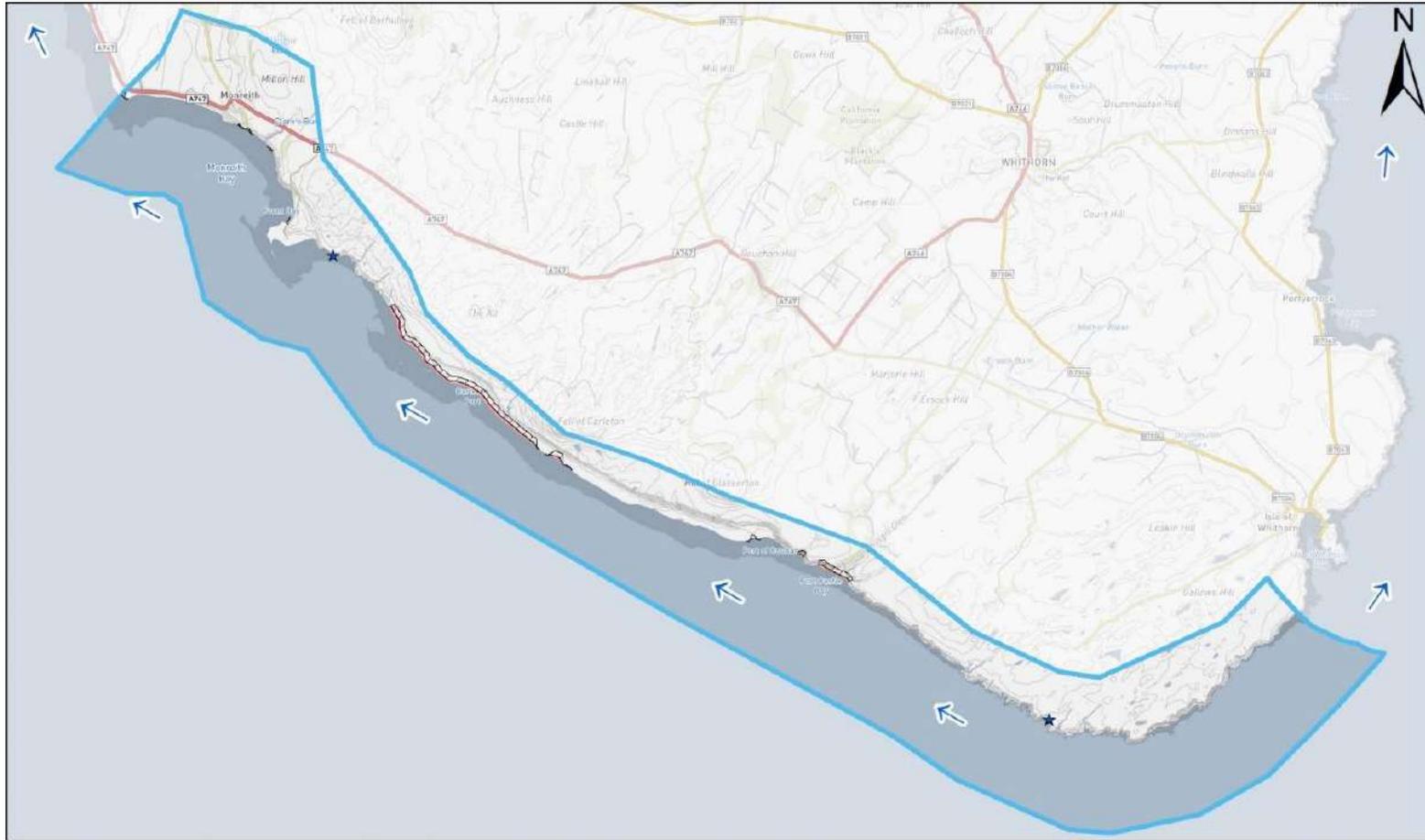


Figure 19.1 Policy Unit 19 Coastal Flood and Erosion Risk

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- Policy Unit
- ★ Cultural Heritage
- Defence Asset
- ↑ Sediment Drift Direction
- 200yr Coastal Flood Risk Receptors**
- Residential Properties
- Non-Residential Properties
- ▲ Utilities
- Future Coastal Erosion (2050)**
- Erosion
- Erosion Influence
- Erosion Vicinity

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 19 extends from the Isle of Whithorn (NX478362) past Burrow Head (NX457339) to Barsalloch Point (NX346410). This policy unit is predominantly part of CPU 4, although the section east of Burrow Head is part of CPU 3. The shoreline generally faces south-west and onto the southern extent of Luce Bay. Luce Bay is exposed to significant waves and strong tidal currents, with a north-westerly sediment drift direction.</p> <p>The shoreline is mainly undeveloped and fringed with rocky cliffs. There is a low wave cut platform located seawards of the cliffs and areas of sandy beach located towards Monreith Bay. There are environmentally designated sites within PU 19. The coastline from Burrow Head extending north-west to the boundary of the policy unit is designated as part of the Luce Bay and Sands SAC, while a shorter section of the coastline from Back Bay to Carghidown is also designated as an SSSI. Burrow Head and West Burrow Head are also designated as SSSIs.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data, there are two cultural heritage features identified to be at a medium likelihood coastal flood risk. Both of these features are scheduled monuments, including Castle Feather located at Burrow Head and Back Bay Fort located at Monreith. When predicted potential changes due to climate change are considered no further cultural heritage features or other additional receptors are identified to be at flood risk.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	2	2
Transport roads (km)	0	0
Transport rail (km)	0	0
Agricultural Land (ha)	0	0
<p><b>Summary of Coastal Flood Risk in PU 19</b></p> <p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change projections are based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown. PU 19 contains a dynamic shoreline with areas of accretion as well as erosion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 19 will have advanced seawards by up to 11m, while other areas will have receded landwards by up to 5m. However, by 2050 Dynamic Coast predicts this shoreline to be predominately erosional.</p> <p>By 2050, Dynamic Coast indicates that 0.01km of minor road at Monreith will be located within the Erosion Vicinity along with an area of Golf Course and Green space (0.06ha). This will also include an area (2ha) of the Back Bay to Carghidown SSSI.</p> <p>By 2100, it is anticipated 0.014km of the same minor road will be located within the Erosional Area. By this stage, one home will be located within the Erosion Influence zone, with a further home and two businesses located within the Erosion Vicinity 2.4ha of the Back Bay to Carghidown SSSI and (10ha) of Luce Bay and Sands SAC will also be located within the Erosional Area.</p>		

## APPENDIX D – POLICY STATEMENTS

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0.01
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	1	1	0	0	2	0.014	0.013	0.04

### Summary of Coastal Erosion Risk in PU 19

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

### EXISTING COASTAL DEFENCES

There are no coastal defence assets located within PU 19.

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✘				No justification for Hold the Line in this policy unit.
Managed Realignment	✘				No existing defences to realign in this policy unit.
No Active Intervention	✔	✔	✔	✔	No potential impacts identified.

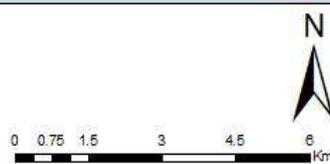
✘ - Reject  
 ✔ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

## APPENDIX D – POLICY STATEMENTS

JUSTIFICATION FOR RETENTION / REJECTION			
<p>The SMP05 recommended Limited intervention which included the monitoring of cultural and heritage features.</p> <p>A policy of No Active Intervention can be applied to PU 19 as there are limited assets identified to be at risk. This approach will allow the shoreline to continue to evolve under the influence of natural processes.</p>			
SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	x	x	x
Managed Realignment	x	x	x
No Active Intervention	C	C	C
<p>x - Reject                      C – Consider                      A – Alternative</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred approach across all epochs for PU 19 is to implement a policy of No Active Intervention.</p> <p>This is the preferred option since there are limited assets at risk. There are two scheduled monuments that have been identified to be at a present day and future medium likelihood flood risk. Generally, Historic Scotland have advised that the owners of scheduled monuments should be encouraged to maintain or improve the management of these sites.</p> <p>The preferred policy of No Active Intervention should be applied to the entire coastal extent of PU 19 and across all epochs, as shown in Figure 19.2.</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p> <p>The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, the Preferred Policy has not changed.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>The Preferred Policy of ~No Active Intervention across the entire extent of PU 19 and all epochs, as presented during the stakeholder engagement was not updated.</p>			

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 19.2 Policy Unit 19 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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D5.2 PU 20 – Barshalloch Point to Low Drumskeog (Port William)

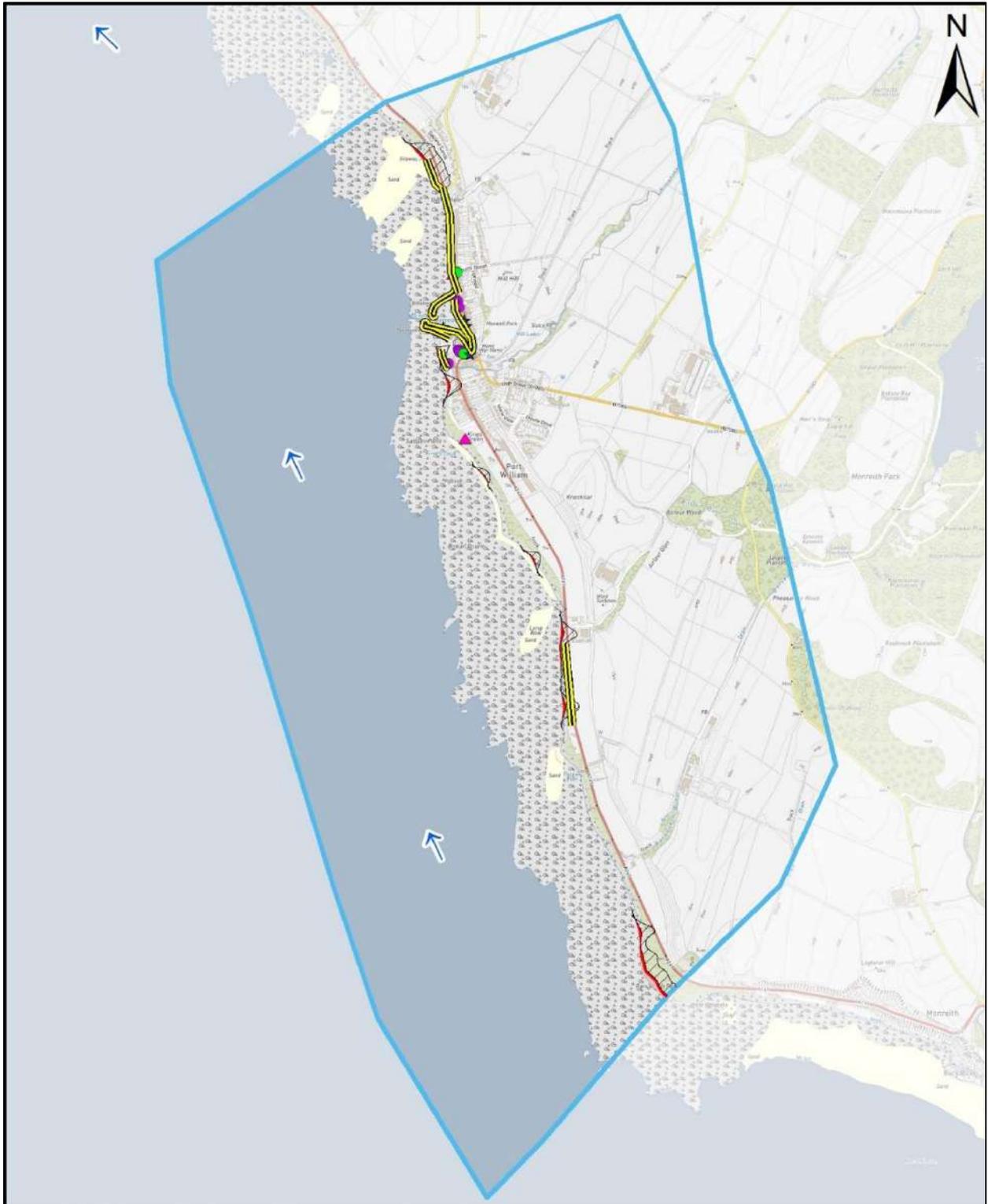
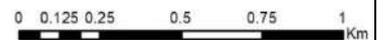


Figure 20.1 Policy Unit 20 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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**DESCRIPTION OF POLICY UNIT 20**

PU 20 generally faces west onto Luce Bay and includes the village of Port William which has numerous listed buildings. This policy unit extends from Barsalloch Point (NX346410) to the northern extent of the village (NX335445). The surrounding hinterland is rural and dominated by agriculture.

PU 20 is situated within CPU 4, which includes Luce Bay, a 20km wide macro-tidal marine embayment. Luce Bay is exposed to significant waves and strong tidal currents, with a north-westerly sediment drift direction. The shoreline at Port William is described as an artificial coast as it has been developed as a harbour. However, there are areas of soft coastline located to the north and south of the main harbour area. The high energy wave environment in Luce Bay has the potential to exacerbate coastal flooding in this policy unit. At Port William, shore facing properties, including homes and businesses have been identified as being at risk of flooding during a medium likelihood coastal flood event.

The Luce Bay and Sands SAC is an environmentally designated site encompassing PU 20.

SEPA has designated Port William as an Objective Target Area. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, it is estimated that two homes and eight business premises are currently at risk of medium likelihood coastal flooding. When predicted potential changes due to climate change were considered, 10 homes and 14 business premises were identified to be at coastal flood risk.

In addition, approximately 0.75km of road is at coastal flood risk, including 0.4km of the A747, Main Street and The Square. This is predicted to increase to 1.1km of road at risk, including 0.8km of A Class Roads, when the anticipated impacts of climate change are considered.

4.3 hectares of agricultural land is also at risk of medium likelihood coastal flooding. All of the affected area is Improved Grazing. Due to climate change this will increase to 5.4 hectares. The annual average damage associated with flooding is £339,891.

There are also three utility receptors at coastal flood risk, increasing to four, when the anticipated impact of climate change is considered. These are all Scottish Water assets.

There are four cultural heritage features at flood risk, these are all Listed Buildings (Category C) located along Main Street and the Harbour area. In the future, it is anticipated that no further cultural heritage features will be placed at coastal flood risk.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	2	10
Business Premises	8	14
Utilities	3	4
Community facilities	0	0
Cultural Heritage	4	4
Transport roads (km)	0.75	1.1
Transport rail (km)	0	0
Agricultural Land (ha)	4.3	5.4

### Summary of Coastal Flood Risk in PU 20

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 20 contains a dynamic shoreline with areas of accretion as well as erosion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 20 will have advanced seawards by up to 11m, whilst other areas will have receded landwards by up to 0.5m. By 2050, the anticipated erosion rates are expected to accelerate and by 2100 this shoreline is expected to have retreated by up to 9m in some places.

By 2050, Dynamic Coast indicates that nine homes and 0.15km of the A747 will be located within the Erosion Vicinity. By 2100, this data indicates that five homes will be located within the Erosion Influence. By this stage, it is also expected that up to 26 homes and 13 businesses will be located within the Erosion Vicinity and 0.13km of the A747 will be located within the Erosional Area, with further sections located within the Erosion Influence and Vicinity zones.

Dynamic Coast also identifies that by 2100 some Scottish Water Assets, including 20m of Gravity Sewers will be located within the Erosional Area. Parts of a Sewage Treatment Site are also located within the Erosion Area and Erosion Influence zones by 2100.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
2050								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	9	0	0	0	0	0	0.15
2100								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	5	26	0	0	13	0.13	0.24	0.5
<b>Summary of Coastal Erosion Risk in PU 20</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								

### EXISTING COASTAL DEFENCE

There are several coastal defence structures associated with PU 20, including a wall, a quay and promenade, as summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
A747 (Airlour to North Barsalloch) (PWill)	Council (Roads)	Wall	2	Continue to monitor, Maintenance required	Road (A747) & property
A747 Port William (North) (PWill001)	Council (Roads)	Promenade	3	None	Road (A747) & properties
Port William (North) (PWill002)		Wall	4	Monitor and Repair as required	
Port William Harbour Breakwater (PWill003)	Council (Roads)	Breakwater	3	None	
Port William Harbour East (PWill004)	Council	Wall	3	None	Rear of properties along Main Street
Port William Harbour East (PWill005)		Wall	3		
Port William Harbour East (PWill006)		Wall	4		
Port William Quay (Harbour Road) (PWill007)	Council	Quay	3	Monitor and Repair as required	Road and properties

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Port William Promenade (PWill008)	Community Resources / Council	Promenade	4	Monitor and Repair as required	Green space and property

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**A747 Airlour to North Barsalloch (PWill)**

This 0.32km defence asset is located along the seaward edge of the A747 from North Barsalloch (NX343419) to Airlour (NX342424). The presence of this defence asset benefits this section of road. The asset condition survey described this asset as in fair condition although the seaward toe is described as cracked and uneven. There is also minor cracking of the exposed face and the crest is uneven and contains low points. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. This asset is fronted by a sand and gravel beach. Continued monitoring and maintenance of this defence asset is required. It is presumed that this coastal defence asset is Council (roads) owned.



**Plate 20.1: PWill (Wall)**

**A747 Port William North (PWill001 –PWill002)**

This 0.6km defence asset is located along the seaward edge of the A747 north of Port William (NX336444) and to the rear of the harbour breakwater (NX337442). The presence of this defence asset benefits this section of road (A747) and adjacent property. The asset condition survey described this asset as in fair to poor condition. The section of wall towards the rear of the harbour is described as being in poor condition with the remainder described as being in fair condition. The area that is in poor condition has lost material at its toe, increasing its risk of slumping. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. Continued condition monitoring and maintenance of this defence asset is required. The 2002 Coastal Protection Inventory referred to these defences as the Bottle Hole Sea Wall, these are Council owned assets.



Plate 20.2: a. PWill001 (Promenade) & b. PWill002 (Wall)

**Port William Harbour Breakwater (PWill003)**

This 0.14km defence asset is located along the northern face of the Port William harbour breakwater (NX337442). This feature was built around the 1980's. The presence of this breakwater defines the harbour area and provides shelter. The asset condition survey described this asset as in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. SMP05 stated that the town frontage relies on the harbour breakwater for protection. The 2002 Coastal Protection Inventory referred to this defence as Council (Roads) owned.



Plate 20.3: PWill003 (Breakwater)

## APPENDIX D – POLICY STATEMENTS

### Port William Harbour East (PWill004 to PWill006)

These defence assets define the eastern extent of Port William Harbour, and back onto the rear of several properties along Main Street. The asset condition survey described these assets as being in poor condition, with the central area being particularly poor. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. It is presumed that these are Council owned coastal defence assets.



Plate 20.4: a. PWill004, PWill005 (Wall) & b. PWill006 (Wall)

[Portwilliam Quay Harbour Road \(PWill007\)](#)

This 0.2km defence asset incorporates the quay and promenade along Harbour Road. The asset condition survey described this asset as being in poor condition with areas of significant cracking and missing joint material on the quay face. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. Dumfries & Galloway Council hold a Harbour Empowerment Order for Port William Harbour that allows the council to legally improve, maintain and manage the harbour, therefore it is assumed that these structures are owned by the Council.

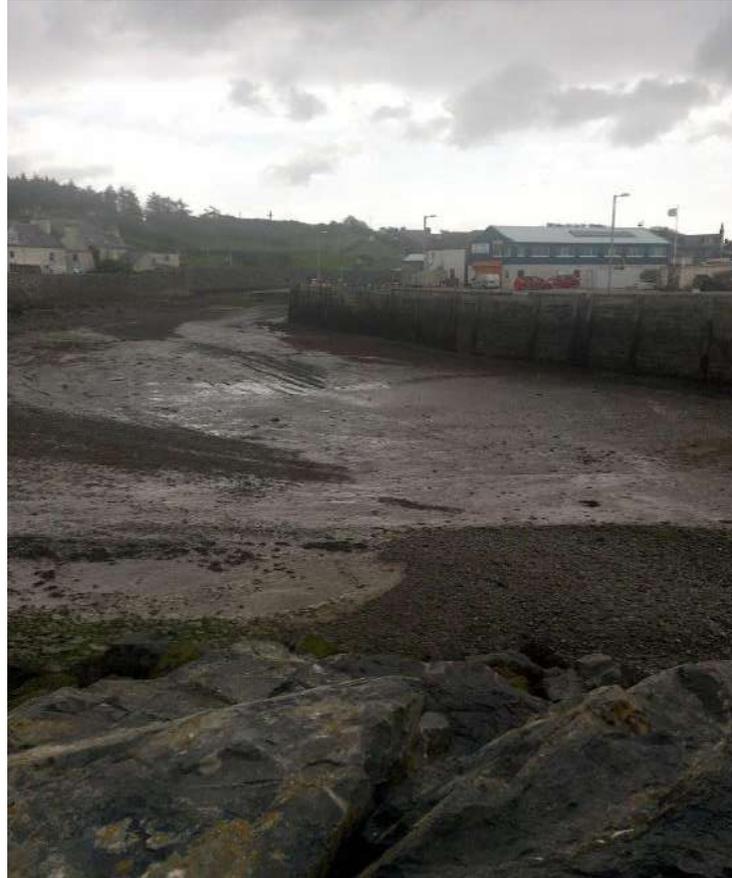
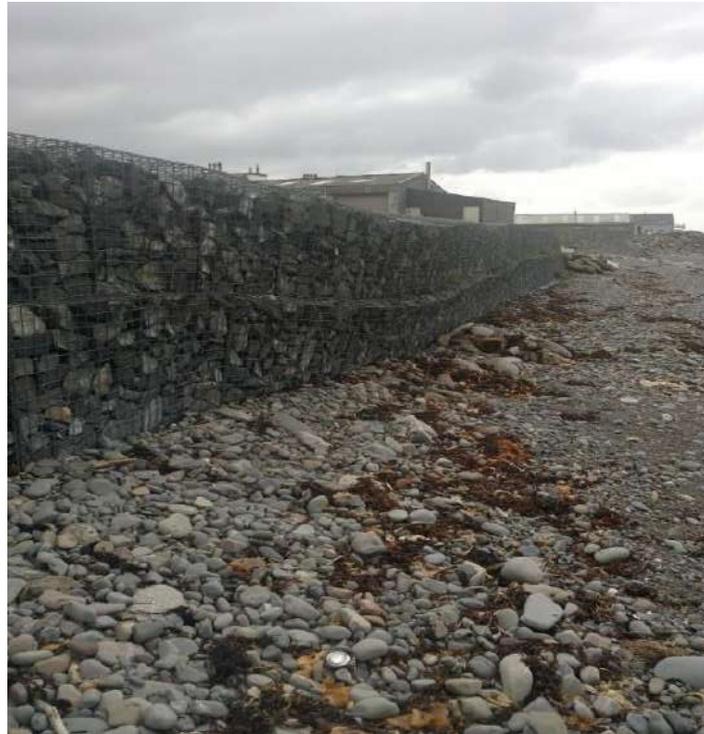


Plate 20.5: PWill007(Quay)

**APPENDIX D – POLICY STATEMENTS**

**Port William Promenade (PWill008)**

This 0.1km defence asset is a series of rock filled gabion baskets that incorporates a promenade located along the shore. The asset condition survey described this asset as being in poor condition, with a significant area of slumping. This particular defence benefits an area of greenspace landwards of the structure and some property. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. It is presumed that these coastal defences are Community / Council owned.



**Plate 20.6: PWill008 (Promenade)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	?	?	?	Progress Hold the Line, economic justification likely to be marginal but there are no potential environmental & heritage and social impacts identified.
Managed Realignment	✓	?	?	!	Progress Managed Realignment, significant potential economic, social and heritage impacts are identified.
No Active Intervention	x				Unlikely to be viable due to proximity of major road and properties to coastline.

x - Reject  
 ✓ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

## APPENDIX D – POLICY STATEMENTS

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 suggested a Hold the Line approach across all epochs (>50years), with the aim of protecting infrastructure, quayside heritage and housing.

Hold the Line can be achieved by maintaining and upgrading the current coastal defences and harbour structures. This approach would require the continued implementation of the existing policy of maintaining and repairing the defences as necessary. However it is acknowledged that it may become economically and technically challenging to continue the maintenance of the defences in the long term. As a minimum the recommendations of the Asset Condition Survey should be followed, although it is recognised that these defences will become increasingly ineffective in the future as a result of climate change. Consequently coastal residents at Port William will need to become increasingly prepared for coastal flood impact.

SMP05 identified that the continued protection of the harbour area defences may threaten infrastructure located northwards as the presence of the harbour may interrupt littoral drift resulting in erosion. It is recommended that this is considered in more detail.

In the event of Hold the Line becoming unsustainable, a Managed Realignment policy should be considered. Managed Realignment has potential for social impacts relating to loss of properties, including several cultural heritage assets (listed buildings). Consultation with Historic Environment Scotland will be required to determine the significance of the potential impact on these heritage assets. The current maintenance and upgrading of existing defences under a short term Hold the Line policy will however allow time for Managed Realignment adaptation approaches to be investigated further and considered for the future.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	A
Managed Realignment	x	x	C
No Active Intervention	x	x	x

x - Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred management approach for PU 20, is to continue with the current Hold the Line policy over the short to medium term, but to increasingly move towards the adoption of a policy of Managed Realignment over the long term. To maintain a Hold the Line policy over the long term, defences would need to be significantly upgraded and it could be difficult to make an economic case for this.

There are no Managed Realignment opportunities identified in the short term, as it is recognised that time is required for Managed Realignment adaptation approaches to be investigated and implemented. In the long term, the relocation of properties, roads and utilities currently identified to be at coastal flood risk, may be more sustainable than options to Hold the Line. It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

The preferred policy of Hold the Line should be applied to the entire coastal extent of PU 20 and across the short term and medium term, epochs (up to the next 50years). Over the long term managed realignment should be considered as shown in Figure 20.2

**POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS**

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

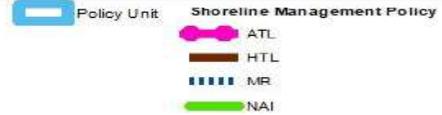
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, no need to change the Preferred Policy has been identified.

**STAKEHOLDER ENGAGEMENT OUTCOME**

The Preferred Hold the Line/Managed Realignment Policy, as presented during the stakeholder engagement was not updated.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 20.2 Policy Unit 20 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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### D5.3 PU 21 – Low Drumskeog to Kilfillan Point



**Figure 21.1 Policy Unit 21 Coastal Flood and Erosion Risk**

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 21 covers part of the eastern shoreline of Luce Bay for a distance of about 17.5km from Low Drumskeog (NX335445) to Kilfillan (NX201540).</p> <p>PU 21 is situated within CPU 4, which includes Luce Bay, a 20km wide macro-tidal marine embayment. Luce Bay is exposed to significant waves and strong tidal currents, with a north-westerly sediment drift direction. The majority of this coastline is soft, with smaller areas of hard and mixed shoreline. There are extensive raised beach deposits located along this section of coastline including gravel ridges.</p> <p>There are several small hamlets and communities located within this policy unit including Stairhaven. The entirety of the shoreline of PU 21 is designated as part of the Luce Bay and Sands SAC.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data, there are no homes or businesses at medium likelihood coastal flood risk. When climate change is considered, no further homes or businesses are affected.</p> <p>There is 0.1km of road affected by medium likelihood coastal flooding, this includes the A747 (0.02km) and a minor road. In the future, when the effects of climate change are considered it is expected that 0.5km of road, including 0.2km of the A747 will be affected by coastal flooding.</p> <p>3.5 hectares of agricultural land is also at risk of medium likelihood coastal flooding. This is mainly Improved and Rough Grazing. Due to climate change this will increase to 5.4 hectares. The annual average damage associated with flooding is £51,836.</p> <p>There is one cultural heritage asset identified to be at coastal flood risk, this is a Scheduled Monument, Stair Haven Broch (NX209533) there are no additional features at coastal flood risk in the future, due to climate change.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	1	1
Transport roads (km)	0.1	0.5
Transport rail (km)	0	0
Agricultural Land (ha)	3.5	5.4
<p><b>Summary of Coastal Flood Risk in PU 21</b></p> <p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information            *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown. The shoreline of PU 21 represents a mix of accretion and erosion, with Dynamic</p>		

## APPENDIX D – POLICY STATEMENTS

Coast estimating that by 2030 parts of the shoreline of PU 21 will have advanced seawards by up to 13m, whilst other area will have receded landwards by up to 6m. However, by 2050 Dynamic Coast predicts this shoreline to be predominately erosional.

A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 21 is tabulated below. Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning. Dynamic Coast indicates that by 2050, there will be two homes located within the Erosion Vicinity along with 3.4km of road, mainly the A747. By 2100, it is anticipated that one home, one business and 0.76km of road will be located within the Erosional Area, with 0.57km of road located within the Erosion Influence zone and a further nine homes, two businesses and 6.5km of road located within the Erosion Vicinity.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	2	0	0	0	0	0	3.4
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
1	0	9	1	0	2	0.76	0.57	6.5

### Summary of Coastal Erosion Risk in PU 21

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

### EXISTING COASTAL DEFENCE

There are sections of coastal defence associated with PU 21, including walls and a promenade. These coastal defences mainly protect the A747 adjacent to Auchenmaig Bay and a minor road and several coastal properties at Stairhaven. The SMP05 notes that no coastal defences are located along the coast road from Port William to Auchenmaig Bay with the exception of some rock tipped onto the foreshore at Garheugh Port and Cragarget. These defences were classified as informal and short lived. The coastal defences within PU 21 are summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Cock Inn, Auchenmaig (AUCHEN001)	Community Council	Wall	4	Continue monitoring & maintenance	Private property
Auchenmaig Bay (AUCHEN002)	Council (Roads)	Promenade	4	Continue monitoring & maintenance	A747
Stairhaven Road (MILL001)	Council (Roads)	Promenade	4	Continue monitoring & maintenance	Private property & Stairhaven Road

## APPENDIX D – POLICY STATEMENTS

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Stairhaven South (MILL002)	Private	Groyne	2	None	Private property & Stairhaven Road
Garheugh Port (AUCH003)	Council (Roads)	Wall	3	Continue maintenance	
(AUCH004)					

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### [Cock Inn, Auchenmaig \(Auchen001\)](#)

This 0.05km defence asset is a wall fronting the carpark of the Cock Inn at Auchenmaig (NX236517). Wave overtopping is reported to impact this area, and the presence of this defence asset benefits this property and carpark. The asset condition survey described this asset as in poor condition, with sections of rock armour missing. The exposed face has holes and the crest is lowered in some sections and overgrown with vegetation. There is a sand and gravel beach located seawards of this defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is required. The 2002 Coastal Protection Inventory referred to these defences as a Community Resource. It is assumed that the Community Council for this area is responsible for these coastal defences.



**Plate 21.1: Auchen001 (Wall)**

### [Auchenmaig Bay \(Auchen002\)](#)

This 0.15km defence asset is a wall fronting the seaward edge of the A747. The presence of this defence asset benefits the adjacent road and property. The asset condition survey described this asset as in poor condition, with some crest material missing and the landward face missing material. There is a sand and

## APPENDIX D – POLICY STATEMENTS

gravel beach located seawards of this defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is required. It is assumed that these are recent (post 2005) defences since they were not reported in SMP05. It is presumed that these coastal defences assets are Council (Roads) owned.



**Plate 21.2: Auchen002 (Promenade)**

### Stairhaven Road (Mill001)

This 0.23km defence asset is a promenade that is located seawards of the Stairhaven Road (NX207538). This defence is described as sparse rock armour, offering little protection. The presence of this defence asset benefits the road and adjacent properties. The asset condition survey described this asset as in poor condition. There is a sand and gravel beach located seawards of this defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is required. SMP05 considered these defences as informal and short-lived. The 2002 Coastal Protection Inventory referred to these defences as a sea wall that is Council (Roads) owned.



Plate 21.3: Mill001 (Promenade)

Stairhaven South (Mill002)

This 0.08km defence asset is described as a groyne that is located seawards of a private property at the terminus of a private access road (NX208536). The presence of this defence asset benefits the adjacent private property. The asset condition survey described this asset as in good condition. There is a sand and gravel beach located seawards of this defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. It is presumed that this feature is a private coastal defence.



Plate 21.4: Mill02 (Groyne)

## APPENDIX D – POLICY STATEMENTS

### Garheugh Port (Auch003 & Auch004)

This 0.6km asset is a wall that is located seawards of the A747. The asset condition survey described this asset as in fair condition. There is a sand and gravel beach located seawards of this defence, however the actual asset is located at an elevated attitude (approx. 30mOD). Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this asset. Considering the location of this asset, elevation (c.30mOD) this is unlikely to be a coastal defence. The SMP05 notes that no coastal defences are located along the coast road from Port William to Auchenmaig Bay, with the exception of some rock tipped onto foreshore at Garheugh Port and Craignarget. It is presumed that this is a Council (Roads) asset but not a coastal defence.

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✘			Hold the Line is unlikely to be economically justifiable.
Managed Realignment	✓	✓	?	?	Managed Realignment is progressed, although there are potential environmental & heritage and social impacts identified.
No Active Intervention	✓	✓	✓	?	No Active Intervention is progressed, again there are potential social impacts identified.
✘ - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

### JUSTIFICATION FOR RETENTION / REJECTION

The SMP05 suggested a policy of No Active Intervention for the most part of this shoreline, with selective areas of Hold the Line.

Retaining the general policy of No Active Intervention will allow the shoreline to continue to evolve in response to natural processes. In implementing this policy consideration should be given to allowing the continued maintenance of localised flood and erosion protection measures for example those currently protecting sections of the A747 which require continued monitoring and maintenance. There is also a need to monitor these defences to identify the possible need for additional works to these defences over time.

There are currently no properties at coastal flood or erosion risk, however there are coastal defences protecting the A747, a minor road and some coastal properties. Managed Realignment should be considered in the longer term to address increased risks from sea level rise.

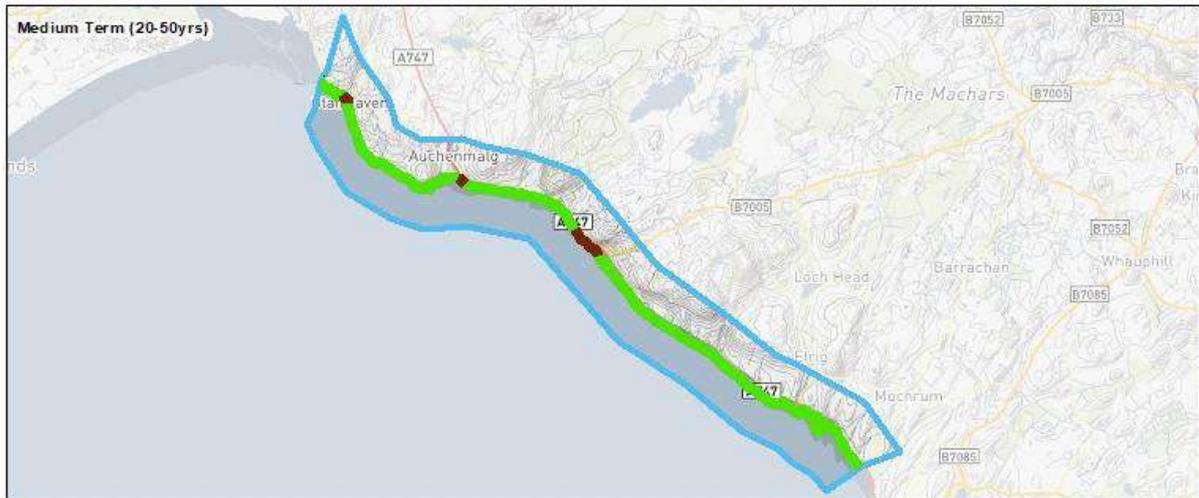
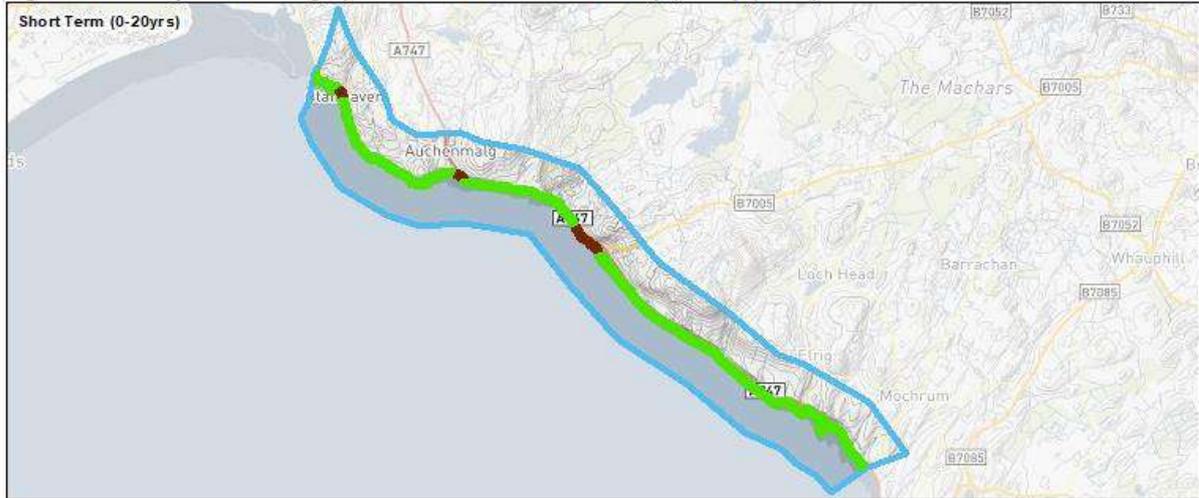
Consultation is required with Historic Environment Scotland regarding the cultural heritage asset (Scheduled Monument) at flood risk and the potential impact that sea-level rise may have upon this feature.

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	x
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C
<p>x - Reject                      C – Consider                      A – Alternative                      *Localised</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred SMP policy for PU 21 is No Active Intervention across all epochs. However, it is acknowledged that over the long term this should be considered alongside a policy of Managed Realignment for the A747 and some coastal properties to ensure the continuing viability of these assets. This will require a detailed assessment and investigation of the possible options.</p> <p>It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.</p> <p>The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 21 and across all epochs as shown in Figure 21.2. Although Managed Realignment should be considered for the A747 and any affected properties over the longer term (50-100yr).</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p> <p>The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated, the Preferred Policy has not changed.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment as presented during the stakeholder engagement was not updated. Figure 21.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 21.</p>			

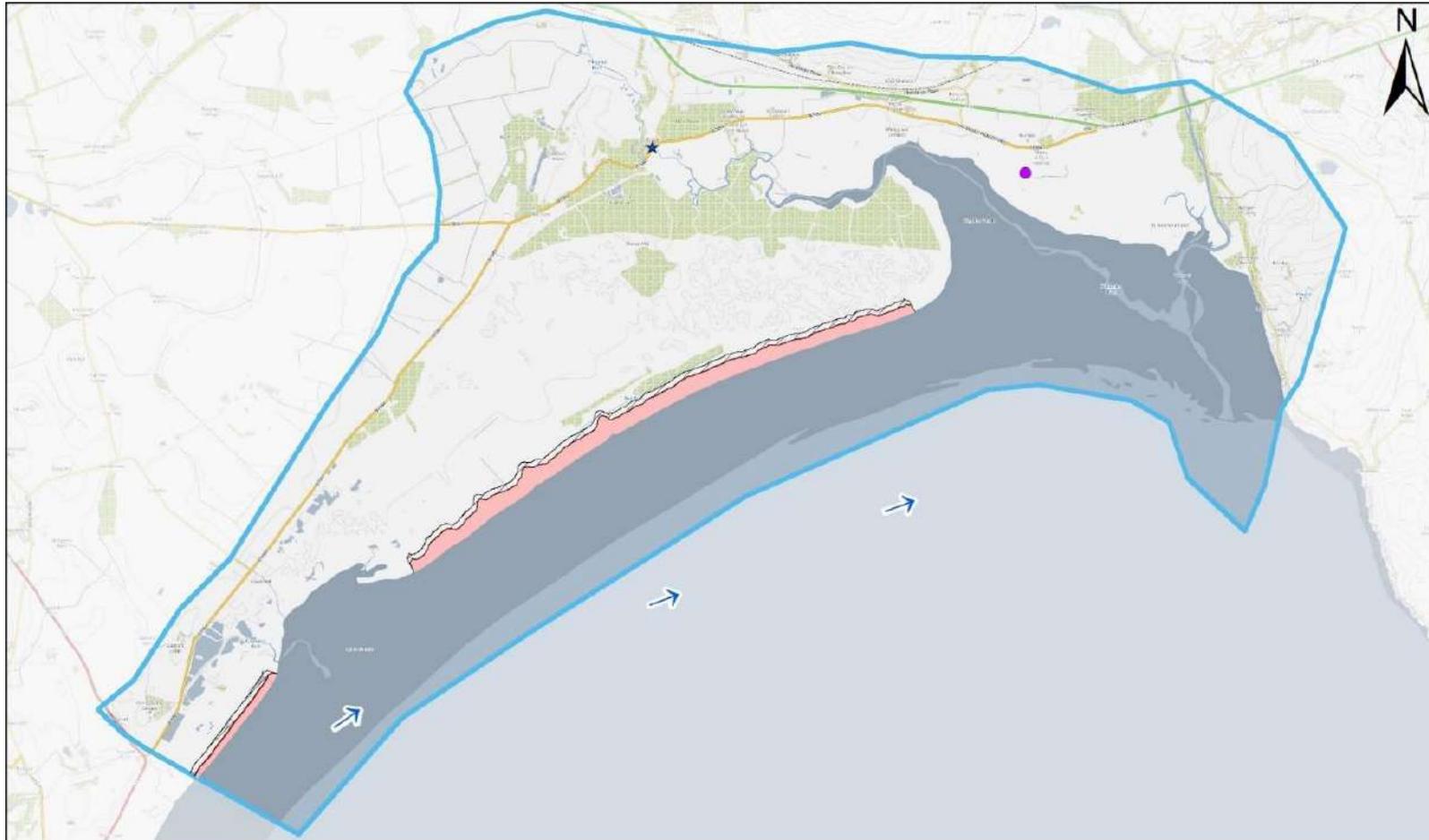
GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 21.2 Policy Unit 21 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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D5.4 PU 22 – Kilfillan Point to Sandhead



**Figure 22.1 Policy Unit 22 Coastal Flood and Erosion Risk**

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0 0.5 1 2 3 4 Km

## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 22 is located at the head of Luce Bay and covers Luce Sands and Torrs Warren. This policy unit includes approximately 13km of shoreline within CPU 4, including the tidally influenced Piltanton Burn and Water of Luce. It extends from Kilfillan (NX201540) in the east to Sandhead (NX014509) in the west. The shoreline of PU 22 is predominately composed of soft sediment, including a large sandy beach and a coastal spit with coastal dune morphology and saltmarsh habitat to the back-beach. Torrs Warren and the coastal dunes indicate an abundance of sediment (sediment sink). The hinterland includes a golf course and MoD property.

There are environmentally designated sites within PU 22. The Bay and surrounding coastline is designated as part of the Luce Bay and Sands SAC, while the area within Luce Bay is designated as the Loch of Inch and Torrs Warren SPA and Ramsar, and Torrs Warren – Luce Sands SSSI. This area includes important dune complex and salt marsh habitats and supports internationally important bird populations.

### FLOOD RISK

Based on SEPA strategic flood mapping data, there are no houses and one business currently at a medium likelihood coastal flood risk. When predicted climate change was considered one house and no further businesses were identified to be at coastal flood risk.

In addition, approximately 0.06km of road is at coastal flood risk, this includes 0.04km of the B7084, with the remainder being minor and private roads. This is predicted to increase to 0.3km of road at flood risk, including 0.07km of the B7084, when the anticipated impacts of climate change are considered.

76 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Approximately 69% of the affected area is Improved Grazing. Due to climate change this will increase to 118 hectares. The annual average damage associated with flooding is £13,876.

There is one cultural heritage feature identified to be at coastal flood risk, this is a Listed Building (Category C) Piltanton Bridge (NX145565). In the future, it is anticipated that climate change will not place any further cultural heritage features at a medium likelihood coastal flood risk.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	1
Business Premises	1	1
Utilities	0	0
Community facilities	0	0
Cultural Heritage	1	1
Transport roads (km)	0.06	0.3
Transport rail (km)	0	0
Agricultural Land (ha)	76	118

#### Summary of Coastal Flood Risk in PU 22

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.

\*Climate change is based on UKCP09 projections.

### EROSION RISK

Luce Bay is described as a sediment sink bounded by twin headlands orientated such that once within the bay, sediment cannot escape and therefore accumulates at the head of the bay at Luce Sands.

## APPENDIX D – POLICY STATEMENTS

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 22 contains a dynamic shoreline that will be dominated by erosion by 2030, with parts of this shoreline receding landwards by between 16m to 60m. By 2100 the extent of erosion will have increased to between 47m to 94m. However, despite the extensive erosion there are no homes, businesses roads or other assets affected by erosion within PU 22.

### EXISTING COASTAL DEFENCE

This is largely a natural sediment sink, with no formal coastal defences, however some ad hoc structures are located at a meander of the Piltanton Burn (NX168565). The SMP05 also reported the existence of informal backshore defences on St Helen's Island constructed by the golf course. This included the vertical emplacement of railway sleepers to form a wall and rock rip rap. The privately owned defences located along the shore of St Helens Island (NX186557) and have been noted as being in poor condition

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No justification for Hold the Line in this policy unit as it is naturally accreting.
Managed Realignment	x				No opportunities for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	?	Progress No Active Intervention in this policy unit.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 suggested a No Active Intervention approach for most part of this shoreline, with limited intervention at the golf course. This applied over the short and medium term with No Active Intervention over the long term (>50years).

Retention of the policy of No Active Intervention will allow the shoreline to continue to evolve in response to natural coastal processes, providing for the natural evolution of the coastal dune and saltmarsh environment located here. There are limited assets at risk from coastal flooding or erosion hence this policy is appropriate. The Piltanton Bridge is a cultural heritage asset (Listed Building Grade C), consultation with Historic Environment Scotland may be required to assess any potential adverse impact on this feature regarding future flooding and erosion.

Some limited maintenance of informal private defences could be permitted if required, however, such work would require consent due to the importance and designated status of the habitats located within this policy unit. Works should only be permitted where they will not impact on flows and sediment transport or cause significant disturbance to designated wintering birds. This may require continued monitoring within PU 22. It is recommended that the golf course should apply 'soft' coastal defence measures and avoid the use of 'hard' options as PU 22 is currently accreting sediment.

Coastal dune management and enhancement should be considered as an alternative to 'hard' coastal defence.

**APPENDIX D – POLICY STATEMENTS**

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	x
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C
x - Reject C – Consider A – Alternative *Localised			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred Shoreline Management Policy for PU 22 is No Active Intervention over all epochs although the continued maintenance of local defences should be permitted provided that they do not interfere with natural coastal processes, including sediment exchange.</p> <p>It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.</p> <p>The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 22 and across all epochs, as shown in Figure 22.2</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p> <p>The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 22, a review of the associated risk did not require a change to the Preferred Management Policy.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment as presented during the stakeholder engagement was not updated. Figure 22.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 22.</p>			

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 22.2 Policy Unit 22 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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D5.5 PU 23 – Sandhead to Chapel Rossan

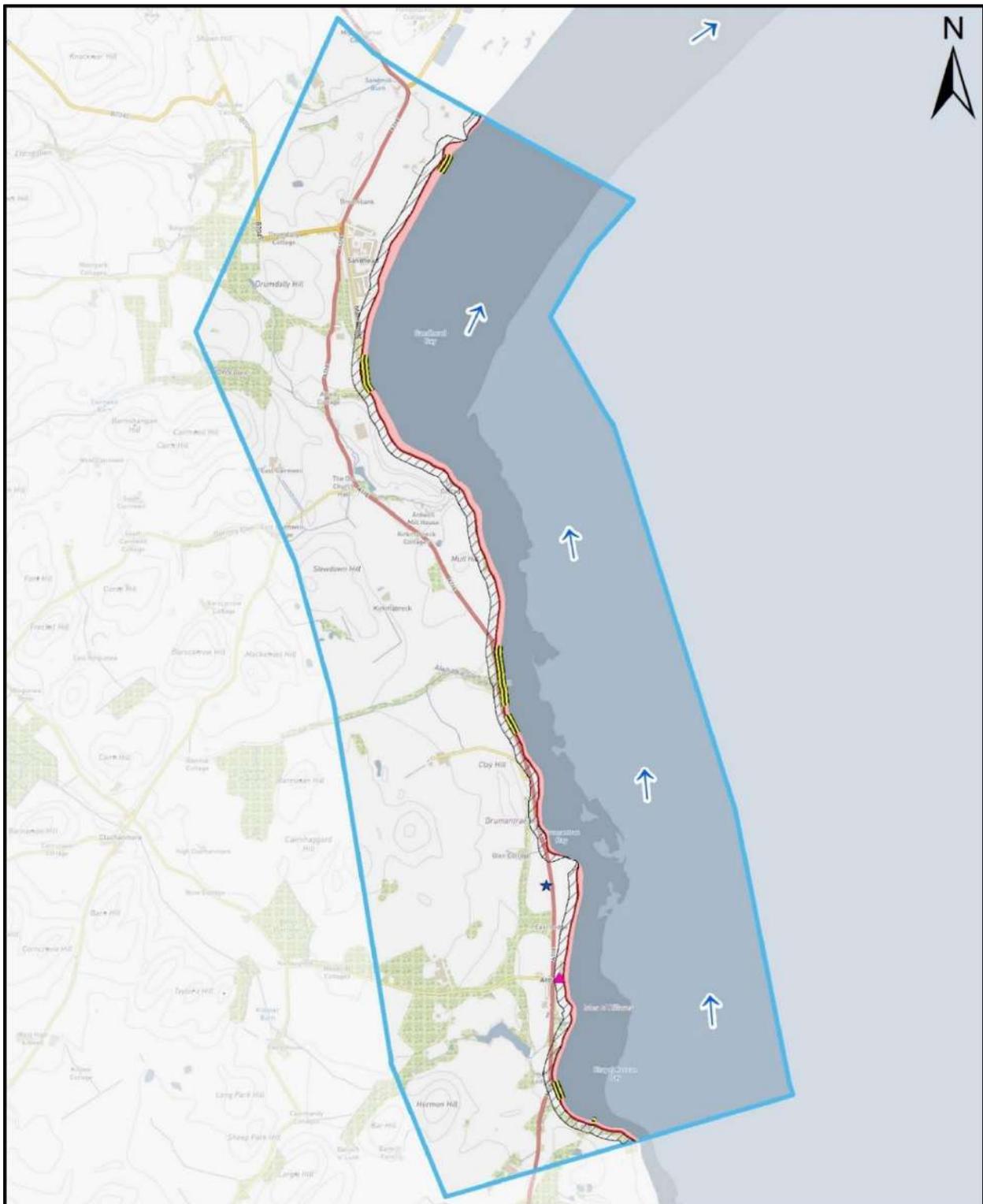


Figure 23.1 Policy Unit 23 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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**DESCRIPTION OF POLICY UNIT**

PU 23 extends from the village of Sandhead (NX014509) to Chapel Rossan Bay (NX114447) and includes approximately 7km of shoreline within CPU 4. The shoreline includes small promontories and intervening bays and faces east towards Luce Bay. Luce Bay is exposed to large waves and strong tidal currents, with a net northerly drift direction along this section of the coast. The majority of this coastline is composed of soft (erodible) material, with smaller areas of artificial shoreline including some coastal defences. The beaches are mainly gravel with some pockets of sand. There is storm beach ridge morphology present along this shoreline.

The two largest settlements in PU 23 are the villages of Sandhead and Ardwell.

There are environmentally designated sites within PU 23. The entirety of the coastline within the policy unit is designated as part of the Luce Bay and Sands SAC, while the area of Luce Bay north of Sandhead is designated as the Loch of Inch and Torrs Warren SPA and Ramsar, and Torrs Warren – Luce Sands SSSI.

Due to the location of PU 23 within Luce Bay, wave overtopping has been a potential issue affecting erosion and flooding. The occurrence of large waves can exacerbate coastal flooding and erosion.

**FLOOD RISK**

Based on SEPA strategic flood mapping data, it is estimated that there are no houses or businesses currently at a medium likelihood coastal flood risk. When predicted changes due to climate change were considered, this increased to four houses and one business at coastal flood risk. These at risk properties are associated with the village of Ardwell.

There is 1.1km of road at risk of medium likelihood coastal flooding, which includes a 0.2km section of the A716 between Ardwell and Chapel Rossan, as well as minor and private roads. In the future, when the effects of climate change are considered it is expected that 1.8km of road will be affected, including 0.3km of the A716.

3.2 hectares of agricultural land is also at risk of medium likelihood coastal flooding, most of which Improved Grazing. Due to climate change this will increase to 6.2 hectares. The annual average damage associated with flooding is £73,078.

One utility, a Scottish Water facility, is at a medium likelihood coastal flood risk, this risk is not expected to increase in the future, due to climate change.

There is also one cultural heritage asset at risk of medium likelihood coastal flooding, this refers to the coastal edge of a Garden and Designed Landscape (Ardwell House). In the future, this will increase to 4, with the addition of three Listed Buildings (Category C) located within Ardwell.

The summary of coastal flood risk tabulated below is based on SEPA National Flood Risk Assessment (NFRA) information.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	4
Business Premises	0	1
Utilities	1	1
Community facilities	0	0
Cultural Heritage	1	4
Transport roads (km)	1.1	1.8
Transport rail (km)	0	0
Agricultural Land (ha)	3.2	6.2

### Summary of Coastal Flood Risk in PU 23

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.

\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 23 is dominated by a shoreline composed of soft sediment, vulnerable to erosion although there are small areas of accretion as well as erosion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 23 will have advanced seawards by up to 6m, whilst others will have receded landwards by up to 16m. By 2030 accretion is confined to Drumantrae Bay, however, by 2050 it is anticipated that even this shoreline will become predominately erosional, receding by up to 16m at the village of Sandhead. By 2050, two homes and one business will be located within the zone of Erosion Influence, whilst 30 homes and three businesses will be located within the Erosion Vicinity. It is also estimated that 0.27km of road will be located within the Erosional Area, another 0.5km located within the Erosion Influence and 1.3km within the Erosion Vicinity.

By 2100, it is anticipated that the shoreline at Sandhead will potentially recede by up 63m. At this time, 147 homes and 25 businesses will be located within the Erosion Area and directly impacted by coastal erosion. It is also anticipated that six homes will be located within the Erosion Influence and 27 homes and four businesses located within the Erosion Vicinity. By this stage, 3.2km of road will be within the Erosion Area including sections of local road and the A716.

Dynamic Coast has also identified that by 2100 there will be areas of Green Space (21ha) and Garden, Designed Landscapes (36ha) located within the Eroded Area. There will also be designated environment sites including SPA (22ha) and SSSI (22.6ha) affected by erosion. It is also anticipated that Scottish Water Assets will be located within the Erosion Area, including (0.17km) of rising mains, Sewage Treatment Works (7ha), Operational Sewers (five), Sewage Outfall (one), gravity pipes (2.4km) and area of Sewage Processing Site (0.07ha).

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning. A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 23 is tabulated overleaf.

## APPENDIX D – POLICY STATEMENTS

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	2	30	0	1	3	0.27	0.5	1.3
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
147	6	27	25	0	4	3.2	0.3	1.38
<b>Summary of Coastal Erosion Risk in PU 23</b>								
<p>This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 &amp; 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.</p>								
Refer to <a href="http://dynamiccoast.com/webmap.html">http://dynamiccoast.com/webmap.html</a> for further information.								
<b>EXISTING COASTAL DEFENCE</b>								
There are sections of coastal defence within PU 23, these include walls and promenades protecting the shoreline, private grounds, access roads, private property and the A716 from erosion. These are in variable condition, ranging from good to poor. The coastal defence assets located within this policy unit are summarised below.								
<b>SUMMARY OF EXISTING COASTAL DEFENCE</b>								
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefiting Area			
Chapel Rossan Bay South (Ard001)	Private	Wall	4	Monitor and continue maintenance	Private property			
Chapel Rossan (Ard002)	Private	Wall	4	Monitor and continue maintenance	Private property & grounds (Listed Building Cat. B)			
A716 Dyemill (Ard003)	Council (Roads)	Wall	4	Monitor and continue maintenance	A716 Main Road			
Dyemill House (Ard004)	Council (Roads)	Promenade	2	-	Dyemill house & Private access road			
Main Street, Sand Head (Ard005)	Council (Roads)	Wall	3	Monitor condition and repair as required	Public Road			
Main Street, Sand Head (Ard006)			3					
Main Street, Sand Head (Ard007)			2					

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Sandhead Park	Private	Wall	-	-	-

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Chapel Rossan Bay South (Ard001)**

This coastal defence is located to the south of Chapel Rossan Bay and benefits open space and property located landwards of this defence. The asset condition survey described this asset as in poor condition, with an undermining seaward toe and access strip. The exposed face also has holes with loss of material. There is an extensive gravel beach located seawards of this defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is recommended. This is a privately owned defence.



**Plate 23.1: Ard001 (Wall)**

**Chapel Rossan (Ard002)**

This coastal defence is a 0.11km wall (NX109450) facing north-east onto Chapel Rossan Bay. The presence of this defence asset benefits Chapel Rossan House, a Listed Building (Category B) located landwards of this defence. The asset condition survey described this asset as in poor condition, with an undermining seaward toe and access strip. The exposed face also has holes with loss of material. There is an extensive gravel beach located seawards of these defences. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is recommended. These are privately owned defences.



Plate 23.2: Ard002 (Wall)

[A716 Dyemill \(Ard003\)](#)

This coastal defence asset is a 0.12km wall (NX106472) located along the shore at Dyemill, this wall protects the shoreline at Dyemill and the adjacent coastal road (A716). The asset condition survey described this coastal defence asset as in poor condition, with cracking of the concrete and spalling on the exposed face. There is a gravel beach located seawards of these defences. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned assets.



Plate 23.3: Ard003 (Wall)

[Dyemill House \(Ard004\)](#)

This coastal defence asset is a 0.10km promenade that protects the seaward edge of a private access road (NX106472) and private property (Dyemill House). The presence of this defence also benefits the A716. Rock armour protects the seaward edge of this access road from erosion. A gravel beach is located seawards of this feature. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The condition of this defence asset scored a conditional grade 2 (good). Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned assets,



Plate 23.4: Ard004 (Promenade)

[Sandhead Main Street \(Ard005, Ard006 & Ard007\)](#)

Defence assets Ard005, Ard006 and Ard007 are shore parallel walls circa 0.2km in length (NX106472) that support the seaward edge of Main Street at Sandhead. The asset condition survey described these coastal defence assets as in fair condition, with cracking of the seaward toe and loss of material from the gabions. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. Continued monitoring and maintenance of this defence asset is recommended. It is presumed that these coastal defences are Council (Roads) owned.



Plate 23.5: Coastal Defence Asset (Ard005)

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✓	✓	?	?	Progress Hold the Line, economic justification likely to be marginal and potential Environmental & Heritage and social impacts identified.
Managed Realignment	✓	✓	?	!	Progress Managed Realignment, potential Environmental & Heritage and significant social impacts identified.
No Active Intervention	✓	✓	?	?	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood / erosion risk management measures.
✘ - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>SMP05 suggested a general No Active Intervention approach with selective Hold the Line to permit upgrading the existing coastal defences. This approach was recommended for all epochs. It was also emphasised that there was a general lack of understanding as to how the upgrade of defences at Dyemill and Chapel Rossan Bay would influence adjacent areas. Beach nourishment or the provision of rock armour to the toe of seawalls was suggested.</p> <p>At present the selective Hold the Line policy is implemented through a do minimum, risk based approach, involving reactive patch and repair of existing coastal defence assets. A policy of No Active Intervention can be applied where the risk is low. It is important to note that the owners of private property are generally responsible for the upkeep of their own coastline and defences (private defence is unlikely to be eligible for public funds).</p> <p>Given the significant number of properties and assets identified to be at risk from future erosion, there is potentially some economic justification for a Hold the Line policy to be applied to the frontages of Sandhead and Ardwell. Sandhead and Ardwell are currently mostly undefended, fronted by a wide macro-tidal beach. Implementation of the Hold the Line approach is recommended through monitoring shoreline change and assessing the risk until these villages are confirmed to be at significant risk. A detailed scheme appraisal will be required to determine the point at which erosion or erosion-related issues and concerns justify potential expenditure, and a phased approach may be best, with light works implemented should the beach start to reduce in size in the future, and if erosion continues to become more extensive, then the need for more substantial defences should be considered. This approach might help retain the beach, and the potential impacts to the adjacent policy units will need to be considered.</p> <p>As coastal flood and erosion risk is anticipated to increase with climate change, a strategy of Managed Realignment may be a more sustainable option for the future. However, Managed Realignment has the potential for significant social impacts relating to the loss of properties. Implementing a minimal Hold the Line policy over the short term will allow time for the detailed investigations needed to consider suitable options for both Hold the Line and Managed Realignment to be completed. This may involve the re-routing or diversion of part of the A716 coastal road and the relocation of property. A policy of No Active Intervention should apply to the remainder of this shoreline.</p>					

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	A*
Managed Realignment	A*	A*	C*
No Active Intervention	C	C	C

x - Reject  
 C - Consider  
 A - Alternative  
 \*- Applies to sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures.

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

There are a significant number of properties and assets identified to be subject to potential coastal erosion risk at Sandhead and Ardwell, due to rising sea levels, giving rise to more extensive coastal erosion than at present. Most of this shoreline is currently undefended and fronted by a wide sandy beach.

The preferred management option for PU 23 is to continue with the present No Active Intervention with selective Hold the Line policy over the short and medium term. No new defences should be constructed in the short-term without a rigorous assessment of their performance in the longer term. Where possible, any defences should be designed to help retain the beach without causing any negative impact to adjacent policy units. Stakeholders should be informed about their vulnerability to climate change impacts, through a preparedness and adaptation programme.

As the erosion risk increases, Managed Realignment may be a more sustainable option in the future, this may involve the re-routing or diversion of the A716 coastal road.

It should be noted that No Active Intervention should be applied to sections of the undeveloped shoreline, where there is no need to maintain existing flood and / or erosion risk management measures as shown in Figure 23.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

The Dynamic Coast second phase data has been considered as part of this SMP and indicates that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 23. Therefore, the previous preferred management approach of selective Hold the Line over the long medium term has been reviewed.

### STAKEHOLDER ENGAGEMENT OUTCOME

On the basis of the potential significant increase in erosion risk it was necessary to consider a more extensive Hold the Line approach over the short and medium term. Managed Realignment was also introduced much sooner than previously proposed, particularly where the A716 coastal road may be suitable for re-routing. No Active Intervention will apply to sections of the shoreline where there is no need to consider flood and erosion risk management measures. It was also proposed that a preparedness and adaptation programme should be set up as soon as possible, to keep stakeholders informed of the risk. Figure 23.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 23.



D5.6 PU 24 – Chapel Rossan to Drummore

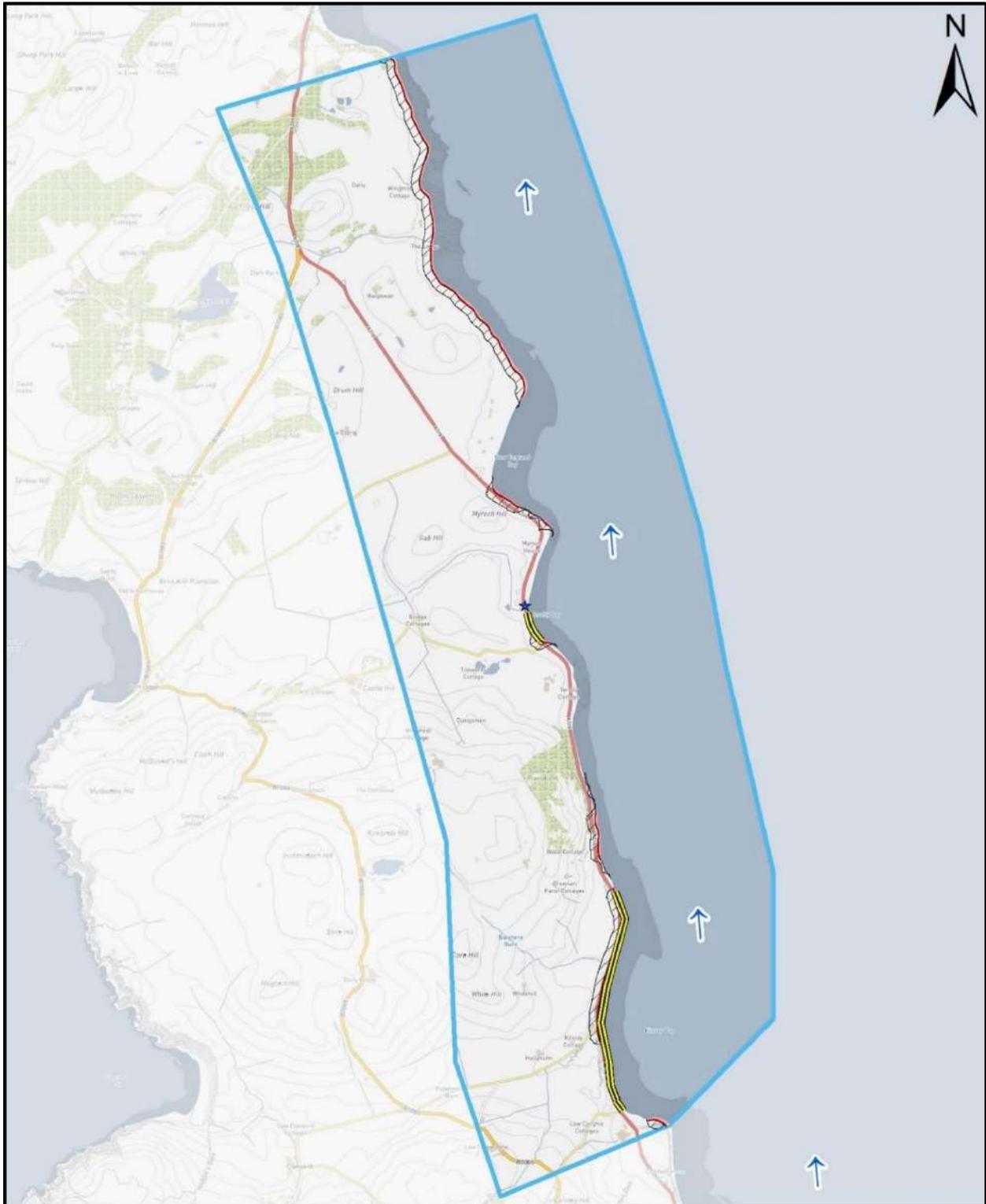


Figure 24.1 Policy Unit 24 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 24 extends from the promontory at south end of Chapel Rossan Bay (NX114447) towards Drummore (Inchmore, NX132375) in the south and includes approximately 8km of shoreline within CPU 4. The shoreline includes promontories and intervening bays and faces east towards Luce Bay. Luce Bay is exposed to significant waves and strong tidal currents, with a northerly drift direction along this part of the shoreline. The majority of this coastline is composed of soft (erodible) material, with smaller areas of artificial shoreline including coastal defences. The beaches are mainly gravel with some pockets of sand. There is storm beach ridge morphology present along this shoreline.

Settlement includes small hamlets and individual dwellings. The hinterland along this coast includes a raised beach and the A716 which runs adjacent to shoreline. There are significant coastal defences that currently protect a section the coastal road, particularly around the head of Kilstay Bay.

The entirety of the coastline within PU 24 is designated as part of the Luce Bay and Sands SAC.

Wave overtopping has been identified as a key issue affecting erosion and flooding along this section of the Dumfries & Galloway coastline. This regularly results in the temporary closure of the A716, during storm events and to allow for the following clearance of over wash material.

### FLOOD RISK

Based on SEPA strategic flood mapping data there are no houses or businesses indicated to be at a medium likelihood coastal flood risk either now or when climate change is considered out to 2080.

There is 0.1km of road at risk of medium likelihood coastal flooding, the A716 shore road that runs adjacent the shoreline. In the future, when the effects of climate change are considered, it is expected that 0.2km of this road will be at flood risk.

0.3 hectares of agricultural land is also at risk of medium likelihood coastal flooding, mostly Improved Grazing. Due to climate change this will increase to 0.68 hectares. The annual average damage associated with flooding is £73,970.

There is also one cultural and heritage feature at a medium likelihood coastal flood risk, this is a Listed Building (Category C) Terally Brick Coal Store, with no additional buildings affected with the inclusion of climate change.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	1	1
Transport roads (km)	0.1	0.2
Transport rail (km)	0	0
Agricultural Land (ha)	0.3	0.68

### Summary of Coastal Flood Risk in PU 24

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.

\*Climate change is based on UKCP09 projections.

## APPENDIX D – POLICY STATEMENTS

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 24 is a dynamic shoreline dominated by areas of erosion, but with some areas of accretion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 24 will have advanced seawards by up to 4.15m, whilst others will recede landwards by up to 3.83m. By 2030 accretion is confined to New England Bay and Terally Bay, while by 2050 it is anticipated that the shoreline of PU 24 will be predominately erosional, receding by up to 5.87m along the shores of Kilstay Bay.

Dynamic Coast indicates that by 2050, one home will be located within the zone of Erosion Influence and three home and four businesses will be located within the Erosion Vicinity. It is also estimated that 0.78km of road is located within the Erosion Influence and 0.99km within the Erosion Vicinity.

By 2100, it is anticipated that parts of the shoreline will recede by up 17.8m, by this time one home and two businesses will be located within the Erosional Area, two home and businesses within the Erosion Influence, and two home and five businesses within the Erosion Vicinity. By this stage, 1.9km of road will be within the Erosion Area mainly the A716.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning. A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 24 is tabulated below.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	1	3	0	0	4	0	0.78	0.99
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
1	2	2	2	2	5	1.9	1.12	1.09

#### Summary of Coastal Erosion Risk in PU 24

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/webmap.html> for further information.

### EXISTING COASTAL DEFENCES

There are coastal defences protecting the coastal road (A716) within PU 24. There also areas of coastal defence located along the southern fringe of Curghie Bay, these defences (rock armour) protect farmland. These are currently in a variable state of repair, as summarised below.

## APPENDIX D – POLICY STATEMENTS

SUMMARY OF EXISTING COASTAL DEFENCE					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Low Curchie (Drum011)	Council (Roads)	Promenade	4	Monitor and Repair as required	A716
A716 Kilstay Bay (Drum012)	Council (Roads)	Wall	5	Monitor and Repair as required	A716 and private property
Terally Bay (South) (Drum013)	Council (Roads)	Embankment	3	Monitor and Repair as required	A716
Terally Bay (North) (Drum014)	Council (Roads)	Wall	4	Monitor and Repair as required	A716

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### Low Curchie (Drum011)

This defence asset is described as a 0.8km promenade located at the seaward edge of Low Curchie before the A716 moves inland towards Drummore. The defence asset is noted to be in poor condition, with material missing from the exposed face and the landward face significantly overgrown. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence, consequently this section of the A716 is identified to be at risk of medium likelihood coastal flooding. Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned.

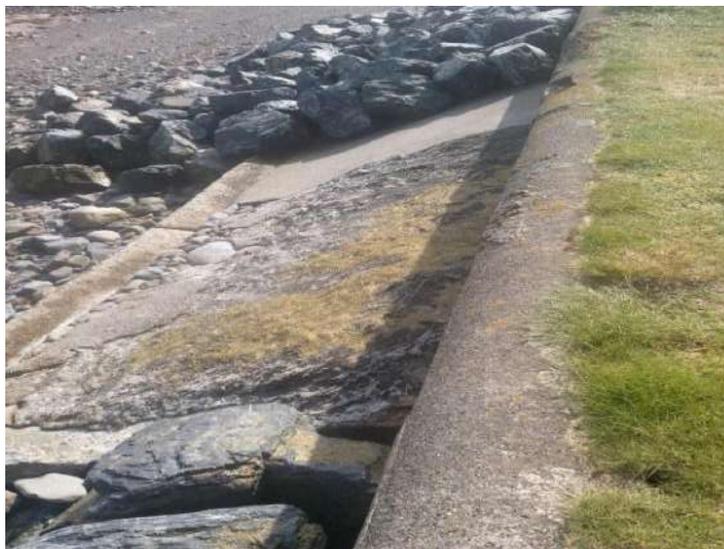


Plate 24.1: Drum011 (Promenade)

### A716 Kilstay Bay (Drum012)

This defence asset is described as a 1.4km wall that fringes the A716 along Kilstay Bay. This defence asset is noted to be in very poor condition, with the landward face significantly overgrown in places. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence, consequently this section of the A716 is at risk of medium likelihood coastal flooding. Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned.



Plate 24.2: Drum012 (Wall)

Terally Bay (South) (Drum013)

This short stretch of embankment (0.2km) is located beside and immediately south of Drum014, the Terally Bay (north) defence asset. These gabion baskets show evidence of slumping and corrosion. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. The unprotected road (A716) to the north of this defence is however at risk of medium likelihood coastal flooding. Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned.

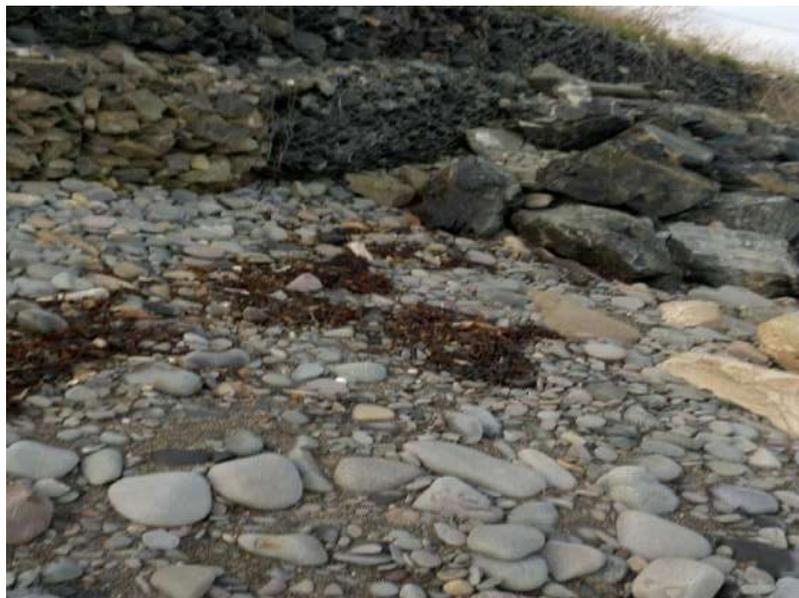


Plate 24.3: Drum013 (Embankment)

**APPENDIX D – POLICY STATEMENTS**

**Terally Bay (North) Drum014**

This 0.2km defence asset is a wall that fringes the seaward edge of the A716 at Terally Bay. The wall is located to the south of the Terally Burn outlet and bridge (NX123409). The asset condition survey described this coastal defence asset as in fair condition. The toe reinforcement is exposed in several locations and there are holes in the sheet piling. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. The unprotected road to the north of this defence is however at risk of medium likelihood coastal flooding. Continued monitoring and maintenance of this defence asset is recommended. The 2002 Coastal Protection Inventory referred to these defences as Council (Roads) owned.



**Plate 24.4: Drum014 (Wall)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	!	x			It is questionable whether Hold the Line is technically sustainable over even the short term as there is limited economic benefit to be derived in this policy unit
Managed Realignment	✓	✓	✓	!	Significant social issues anticipated, to applying Managed Realignment in this policy unit.
No Active Intervention	x				No Active Intervention in the short term could lead to significant disruption.

- x - Reject
- ✓ - Progress
- ? - Progress, however potential for impacts identified
- ! - Progress, however potential for significant impacts identified

## APPENDIX D – POLICY STATEMENTS

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 suggested a No Active Intervention approach with selective Hold the Line to facilitate upgrading existing coastal defences. This approach was recommended for all epochs although it was noted that opportunities to upgrade defences to improve efficiency, were associated with considerable cost. Beach nourishment and reinforcement of the existing defence with rock armour was suggested. However, it was also identified that the protection of one stretch of the coast has the potential to cause damage to adjacent areas.

The A716 runs adjacent to the shoreline of PU 24 along Kilstay Bay and is partially protected by a series of coastal defence assets including a substantial sea wall. Development of options to improve the existing coastal defences to implement a policy of Hold the Line without interfering with natural coastal processes or causing direct or indirect impacts on designated habitat within the immediately adjacent SAC would be difficult and unlikely to be effective in the long term. There is limited economic justification for continuing a Hold the Line policy as the main asset affected is the A716 and there are local diversions available which could be upgraded as part of a more sustainable Managed Realignment policy.

Wave impact and overtopping exacerbates coastal flooding and erosion issues along this section of the Dumfries & Galloway coast and has been responsible for road closures due to the creation of dangerous driving conditions. Short-term solutions, such as temporary road closure and diversion have proven to be effective in managing this risk albeit at some disruption to locals. A sustainable longer term solution would be to improve the alternative route to Drummore so that closure of the A716 is less disruptive to local residents.

A Managed Realignment policy whereby the alternatives to the A716 are upgraded to ensure safe travel accompanied by monitoring and management of the risk to travel on the A716 with immediate closure when it becomes unsafe represents a sustainable long term solution. It is acknowledged that this may cause inconvenience to local communities, but it will provide a safer alternative, particularly in the medium and long term.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	x	x
Managed Realignment	A	C	C
No Active Intervention	x	x	x

x - Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The recommended policy for PU 24 is Hold the Line over the short-term moving to Managed Realignment for the remaining epochs. Ongoing maintenance of the defences to the A716 may be sufficient to sustain this coastal road for the immediate short term, but if climate change results in the projected degree of sea level rise this is unlikely to be sustainable over the medium and longer term.

More detailed scheme level appraisal of Managed Realignment options and opportunities is required. It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

It is recommended that stakeholders are informed about their vulnerability to climate change, through a preparedness and adaptation programme.

## APPENDIX D – POLICY STATEMENTS

The preferred policy should be applied to the entire coastal extent of PU 24, as shown in Figure 24.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

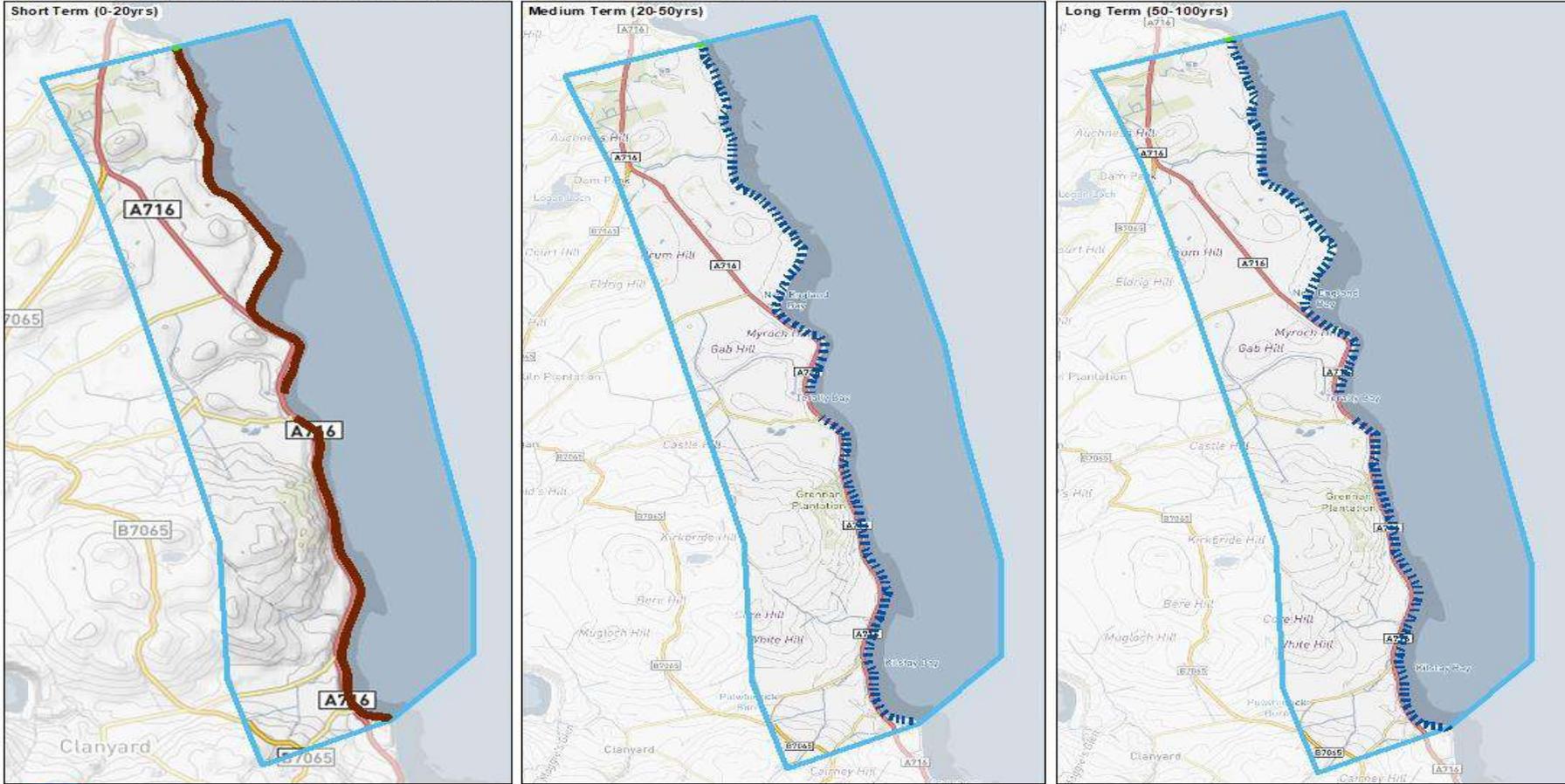
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 24, the Preferred Policy has not changed.

### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of initially Hold the Line, moving to a more sustainable Managed Realignment policy as presented during the stakeholder engagement was not updated.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 24.2 Policy Unit 24 Geographical Extent of Preferred Policy (0-100yr) All Epochs



- Policy Unit
- ATL
- HTL
- MR
- NAI



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D5.7 PU 25 – Drummore

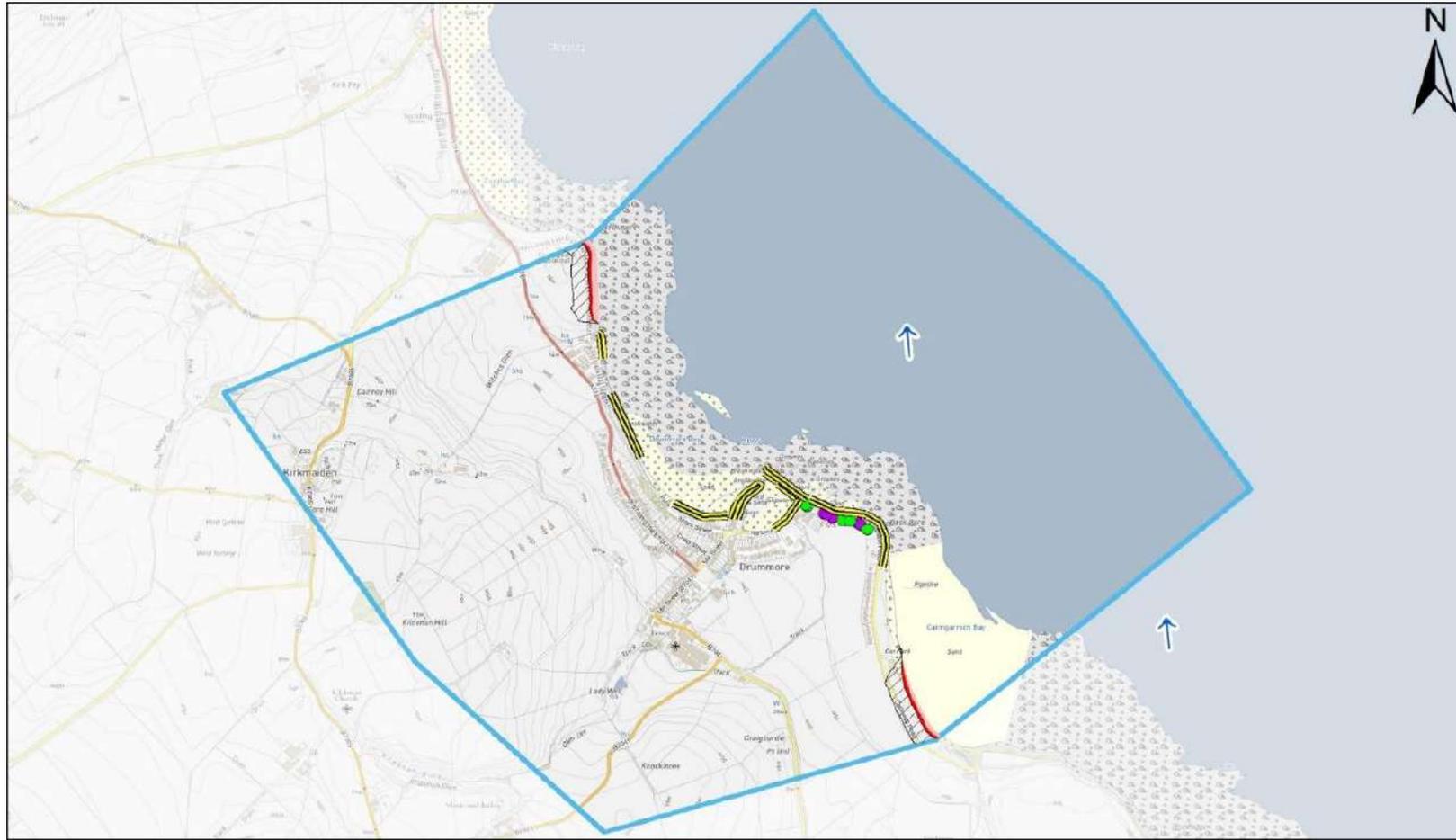


Figure 25.1 Policy Unit 25 Coastal Flood and Erosion Risk

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Policy Unit	200yr Coastal Flood Risk Receptors	Future Coastal Erosion (2050)
Cultural Heritage	Residential Properties	Erosion Influence
Defence Asset	Non-Residential Properties	Erosion Vicinity
Sediment Drift Direction	Utilities	

## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 25 includes approximately 2km of shoreline stretching from Inchmore (NX132375) to Cairngarroch Bay (NX143360) including the village of Drummore. This section of shoreline is within CPU 4 and faces north-east onto Luce Bay.</p> <p>The coastal village of Drummore is located in an embayment surrounded by rocky platforms with raised beach deposits. The frontage at Drummore is prone to localised slippage of the coastal cliffs. The foreshore of PU 25 contains sand and gravel, transported here by a predominately northerly drift which contributes to siltation issues at Drummore Harbour as sediment tends to get trapped by the enclosing walls of the harbour.</p> <p>PU 25 is described as an artificial shoreline as it includes sea walls, promenade, breakwaters and a quay, the majority of which are formal defences.</p> <p>The entirety of the coastline within PU 25 is designated as part of the Luce Bay and Sands SAC.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data there are five homes and six business premises at medium likelihood coastal flood risk within PU 25. It is anticipated that this will increase to nine homes and seven business premises in the future as the result of climate change.</p> <p>There is also 0.29km of minor road presently estimated to be at medium likelihood coastal flood risk, increasing to 0.32km in the future.</p> <p>0.3 hectares of agricultural land is also at risk of medium likelihood coastal flooding. Most of this is Improved Grazing. Due to climate change this will increase to 0.4 hectares. The annual average damage associated with flooding is £39,107.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	5	9
Business Premises	6	7
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	0.29	0.32
Transport rail (km)	0	0
Agricultural Land (ha)	0.3	0.4
<p><b>Summary of Coastal Flood Risk in PU 25</b></p>		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 25 has a mix of dynamic soft shoreline with small areas of accretion as well as erosion, and extensive coastal protection works. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 25 will have</p>		

## APPENDIX D – POLICY STATEMENTS

advanced seawards by up to 5.7m, whilst others will have receded landwards by up to 3.3m. By 2060 it is anticipated that this shoreline will become predominately erosional, receding by up to 10m towards the north of Drummore Bay. By 2050 0.34km of road is located within Erosion Vicinity, no other assets are identified to be at risk of coastal erosion.

By 2100, it is anticipated that the shoreline north of Drummore Bay will probably recede by up 17m, nine homes and one business will be located within the Erosion Vicinity and by this stage, and 0.36km of road will be within the Erosion Area including sections of local road.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning. A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 25 is tabulated below.

Homes			Businesses			Roads (all) (km)		
2050								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0	0	0.34
2100								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	9	0	0	1	0.36	0.09	0.32

### Summary of Coastal Erosion Risk in PU 25

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/webmap.html> for further information.

## EXISTING COASTAL DEFENCE

There are a number of coastal defences located within PU 25, these are mainly located in and to the south of Drummore Bay, around the village and harbour area. Other coastal defences located to the north of Drummore include rock armour lining the frontage of a static caravan park (NX132373). Coastal defences located within PU 25 are summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Cailiness Road (Drum001)	Council (Roads)	Wall	3	Monitor and Repair as required	Minor road & Properties
(Drum002)		Promenade	2		
(Drum003)		Promenade	3		
Drummore Harbour (East) (Drum004)	Private	Wall	3	Monitor and Repair as required	Harbour & Quay
(Drum005)		Quay	4		

## APPENDIX D – POLICY STATEMENTS

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
(Drum006)	Private	Wall	2	Monitor and Repair as required	Harbour & Quay
Harbour Road (Drum007)	Private	Promenade	4	-	Minor Road
Drummore Harbour (West) (Drum008)	Private	Breakwater	3	-	-
Shore Road (East) (Drum009)	Council (Roads)	Promenade	3	Monitor	Green Space & backshore
Shore Road (North) (Drum010)	Council (Roads)	Promenade	4	Monitor and Repair as required	Cliff-top properties and A716
Drummore Park	Private	Revetment	-	-	-

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### Cailiness Road (Drum001-Drum003)

This defence asset is described as a 0.4km wall and promenade located along the seaward edge of Cailiness Road, towards the south of the village. This defence asset is described as being in fair to good condition although there is material missing from the seaward toe. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence. Continued monitoring and maintenance of this defence asset is recommended. It is presumed that this is a Council (Roads) coastal defence asset.

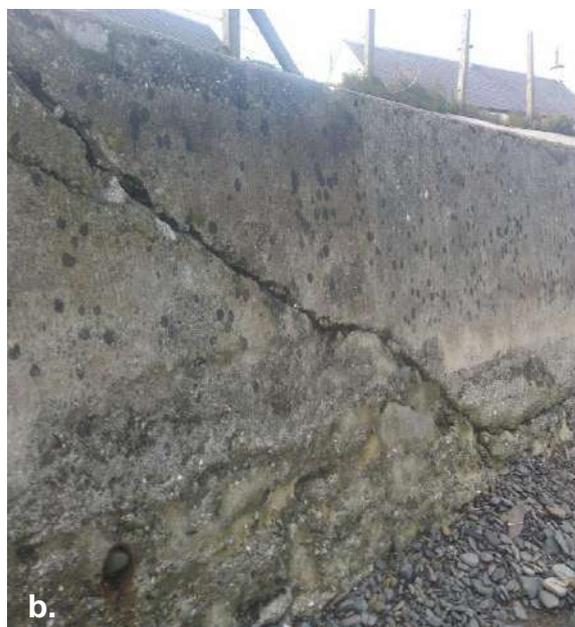


Plate 25.1 a. Drum001 (Wall) & b. Drum003 (Wall)

### Drummore Harbour (East) (Drum004-Drum006)

This series of defence assets include the quay and walls that comprise Drummore Harbour (East), located along the seaward edge of Cailiness Road, towards the south of the village.



Plate 25.2 a. Drum005 (Quay) & b. Drum006 (Wall)

Drummore Harbour Road (Drum007)

This defence asset is located along the seaward edge of the Harbour Road for about 0.1km and described as a promenade and is in poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this formal defence. The 2002 Coastal Protection Inventory referred to these defences as private and MoD owned coastal defence assets, however the Drummore Harbour area is currently managed by the Kirkmaiden Community Harbour Trust.



Plate 25.3 Drum007 (Promenade)

Drummore Harbour (West) (Drum008)

This defence asset is described as a breakwater and is the western seaward extending arm of Drummore Harbour. The condition of this defence asset is described as fair. The 2002 Coastal Protection Inventory

## APPENDIX D – POLICY STATEMENTS

referred to these defences as private and MoD owned coastal defence assets, however the Drummore Harbour area is currently managed by the Kirkmaiden Community Harbour Trust.



**Plate 25.4 Drum008 (Wall)**

### Shore Road (East) (Drum009)

This low level wall fringes the shoreline seawards of the Shore Road, separating the backshore from an area of green space located to the rear of properties. This area is described as a promenade and extends along the shoreline for about 0.2km and is in fair condition. SMP05 noted that this area was actively accreting. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located a short distance landwards of this formal defence. The 2002 Coastal Protection Inventory referred to these defences as the Shore Street Seawall, and Council (Roads) owned.



**Plate 25.5 Drum009 (Promenade)**

### Shore Road (North) (Drum010)

This wall fringes the shoreline of Drummore Bay to the north of the village. This wall extends along the shoreline for about 0.2km, it is noted to be in fair condition. This wall supports the cliff line located landwards that SMP05 described as prone to slippage. Anecdotal evidence suggests that the presence of this wall benefits clifftop properties and a section of the A716. Based on SEPA flood mapping, the

## APPENDIX D – POLICY STATEMENTS

medium likelihood coastal flood extent does not extend landwards of this formal defence due to the steep landwards topography. The 2002 Coastal Protection Inventory referred to these defences as the Low Road Armour, these are Council (Roads) owned assets.



Plate 25.5 Drum010 (Promenade)

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
<b>Advance the Line</b>	x				No justification for Advance the Line in this policy unit.
<b>Hold the Line</b>	✓	x			It is likely to be economically challenging to Hold the Line in this policy unit.
<b>Managed Realignment</b>	?	✓	?	!	Managed Realignment is progressed, potential technical, environment and heritage impacts are identified, as is some significant social impacts.
<b>No Active Intervention</b>	x				No Active Intervention is not considered viable at least in the short term due to the proximity of properties to the coastline.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 recommended a Hold the Line approach across all epochs, although warned of the potential disruption this had on the sediment budget of the area. They noted that the presence of the harbour area may reduce sediment supply to the north of this area, therefore affecting adjacent policy units.

The key risk to Drummore is derived from coastal flooding, particularly to properties and the road located to the south-east of the village (Cailiness Road). To the east of the harbour wave overtopping has been an issue, this area is currently defended by a concrete seawall. The continuation of a Hold the Line strategy would require the improvement and possible extension of existing defences. Given the limited number of properties affected this policy would be challenging to justify. In the short term inspection and maintenance of the existing structures, with repairs and remedial works may be required.

## APPENDIX D – POLICY STATEMENTS

Over the medium and long term, Managed Realignment should be considered, although considerable challenges are expected since the backshore to the north of this policy unit is formed by cliffs. Furthermore, Managed Realignment has potential to lead to significant social impacts relating to loss of properties. Detailed study would be required to identify the most suitable and sustainable option for Managed Realignment.

### SELECTION OF POLICY

Policy	Short-Term (0-20yr)	Medium-Term (20-50yr)	Long-Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	x	x
Managed Realignment	A	C	C
No Active Intervention	x	x	x

x - Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred approach in the short term is Hold the Line, although it is anticipated that this will become technically and economically challenging to sustain, due to climate change and predicted future sea-level rise.

Hold the Line in the short term can be achieved by maintaining the existing defences through proactive maintenance, whilst further studies are undertaken to identify opportunities for Managed Realignment in the future.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

The preferred policy of Hold the Line should be applied to areas of existing coastal defence for the short term (0-20yr), with Managed Realignment considered as an alternative approach. Over the medium and long term (20-100yr) Managed Realignment should be applied to the entire coastal extent of PU 25, as shown in Figure 25

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021

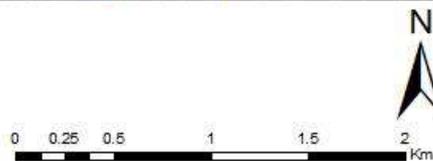
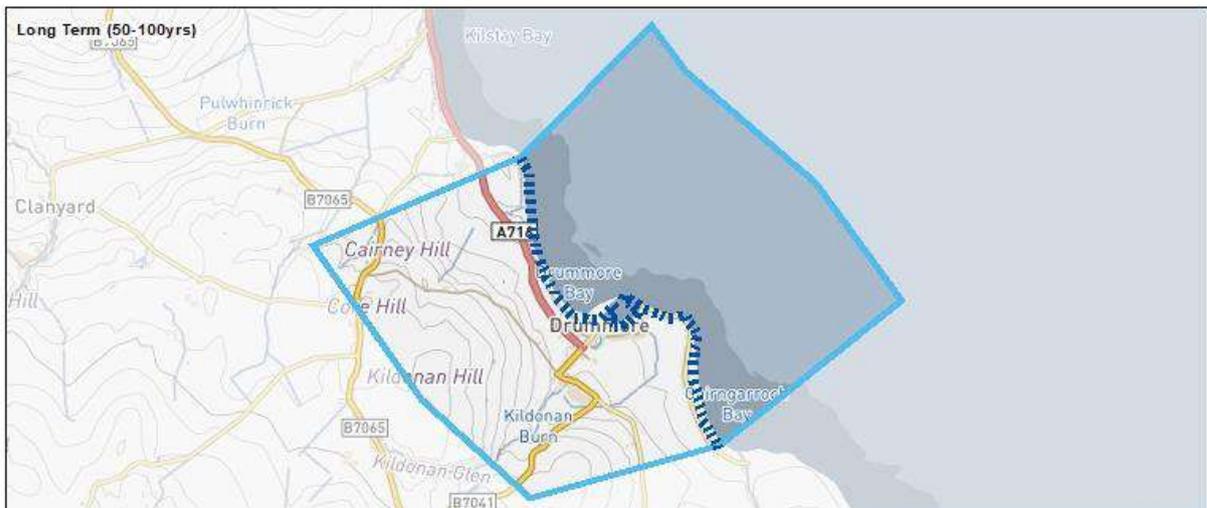
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 25, the recommended Preferred Policy of 'Hold the Line' still applies over the short term, with Managed Realignment, including the potential re-routing of the Cailiness Road to be considered over the medium and long term.

### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of Hold the Line moving to a more sustainable Managed Realignment policy in the medium to long terms as presented during the stakeholder engagement was not updated.

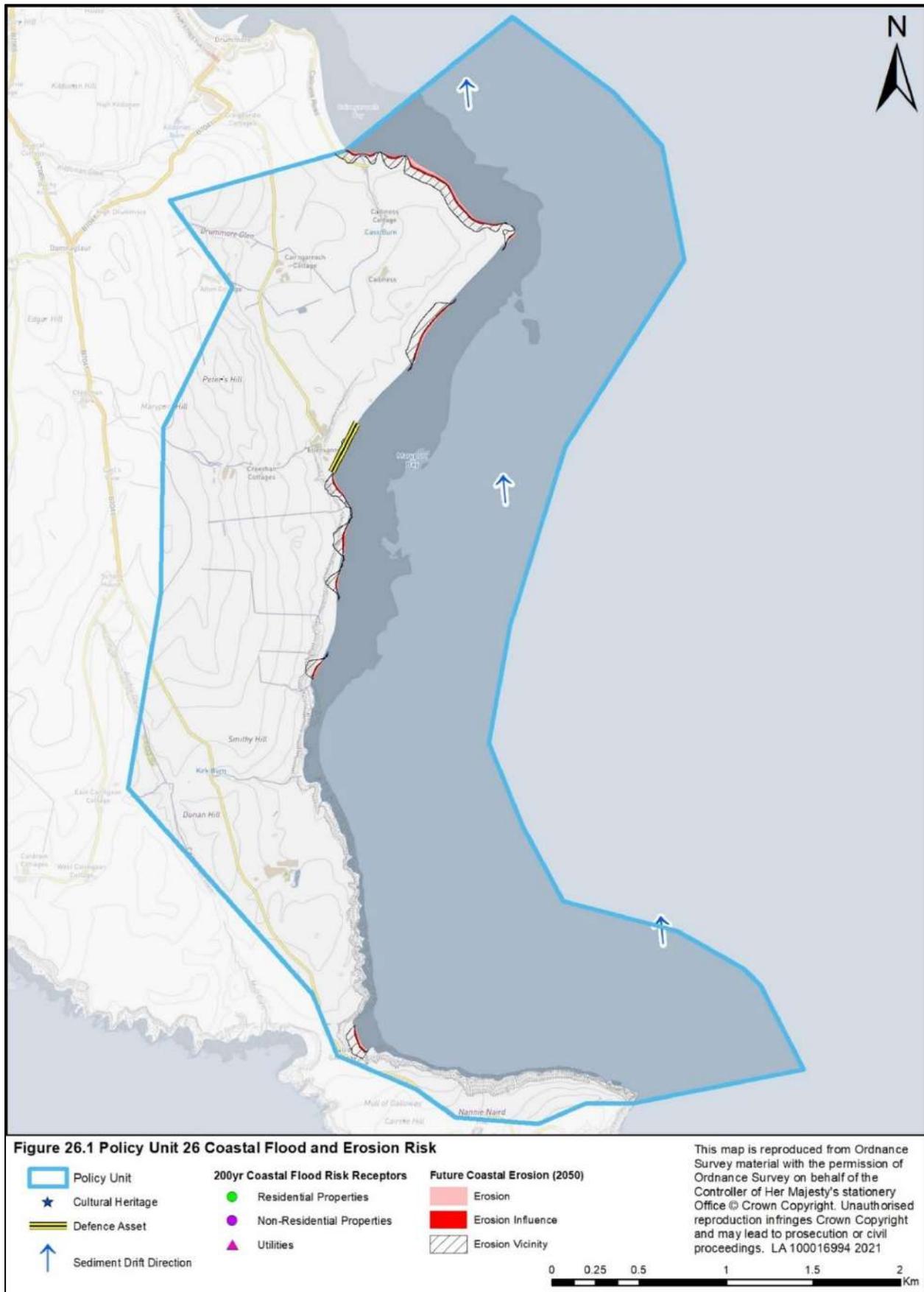
**GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES**

**Figure 25.2 Policy Unit 25 Geographical Extent of Preferred Policy (0-100yr) All Epochs**



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D5.8 PU 26 – Drummore to Mull of Galloway



## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 26 includes 7.5km of shoreline within CPU 4, extending from Cairngarroch Bay (NX143360) to the Mull of Galloway (NX160305). This section of coast generally faces east towards Luce Bay and is exposed to significant waves and strong tidal currents, with a northerly sediment drift direction. There are sand and gravel beaches located towards the north of this policy unit, however these decrease in size and extent as the Mull of Galloway is approached. At low tide areas of low rock platforms are exposed along the foreshore.</p> <p>From Maryport to the Mull of Galloway, the shoreline becomes increasingly dominated by high rocky cliffs. This section of coastline is not easily accessed and remains largely undeveloped.</p> <p>The entirety of the coastline within PU 26 is designated as part of the Luce Bay and Sands SAC, while the coastline extending from just north of East Tarbert to beyond the southern extent of the Policy unit is also designated as part of the Mull of Galloway SAC and SSSI. A RSPB site is located at the Mull of Galloway.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data there are no homes, businesses, utilities, community facilities at a medium likelihood coastal flood risk either now or in the future within PU 26.</p> <p>There are also no roads identified to be at a medium likelihood coastal flood risk. 1.6hectares of agricultural land is at risk of medium likelihood coastal flooding, mostly Improved Grazing. Due to climate change this will increase to three hectares. The annual average damage associated with flooding is £60.</p> <p>There is 1 cultural and heritage site, a Scheduled Monument referred to as St Medans Chapel &amp; Cave, Mull Farm identified to be at future coastal flood risk.</p>		
Receptor	Medium likelihood	Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	1
Transport roads (km)	0	0
Transport rail (km)	0	0
Agricultural Land (ha)	1.6	3
<p><b>Summary of Coastal Flood Risk in PU 26</b></p> <p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 26 has a mixed shoreline with small areas of accretion and erosion. Dynamic Coast estimates that by 2030 parts of the shoreline will have advanced seawards by up to 3.2m, whilst other areas will recede landwards by up to 5.4m. By 2030 accretion is confined to Cailness Bay, however, by 2060 it is</p>		

## APPENDIX D – POLICY STATEMENTS

anticipated that this shoreline will also become predominately erosional, receding by up to 11.4m. Additionally by 2050, one business will be located within the Erosion Vicinity zone.

By 2100, it is anticipated that the shoreline at Cailness Bay will probably recede by up 18.4m, no further homes, businesses or assets are identified to be at risk.

It is noted that assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning. A summary of homes, business and roads (all classes) affected by anticipated future erosion by 2050 and 2100 within PU 26 is tabulated below.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	1	0	0	0
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	1	0	0	0

### Summary of Coastal Erosion Risk in PU 26

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/webmap.html> for further information.

### EXISTING COASTAL DEFENCE

There is a small section of formal coastal defence in the form of a rock revetment located at Maryport Bay protecting a caravan site (Maryport Holiday Park) and adjacent farmland. This site is located on a shingle plateau, close to the shore edge. SMP05 stated that storms eroded the plateau edge due to wave action and also noted that erosion of this area and other adjoining stretches, provides sediment that is then transported northwards by wave action to feed the beaches at Drummore. SMP05 described these defences as private defences. Coastal defences located within PU 26 are summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Maryport Bay (Mary001)	Private	Promenade	<b>3</b>	-	Private recreational site & farmland

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**APPENDIX D – POLICY STATEMENTS**

**Maryport Bay (Mary001)**

This defence asset fringes the frontage of Maryport Bay, the defence is described as a 0.3km promenade consisting of rock armour and was noted to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this formal defence. The presence of this defence asset benefits a private property and agricultural land located landwards. SMP05 noted that the presence of these defences does not impact significantly on coastal processes. These are privately owned defences.



**Plate 26.1: Mary001 Promenade**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✘				No justification for Advance the Line in this policy unit.
Hold the Line	✘				No justification for a Hold the Line policy in this policy unit.
Managed Realignment	✘				No opportunities for Managed Realignment identified in this policy unit.
No Active Intervention	✓	✓	✓	?	Progress a No Active Intervention policy, potential social impacts identified.

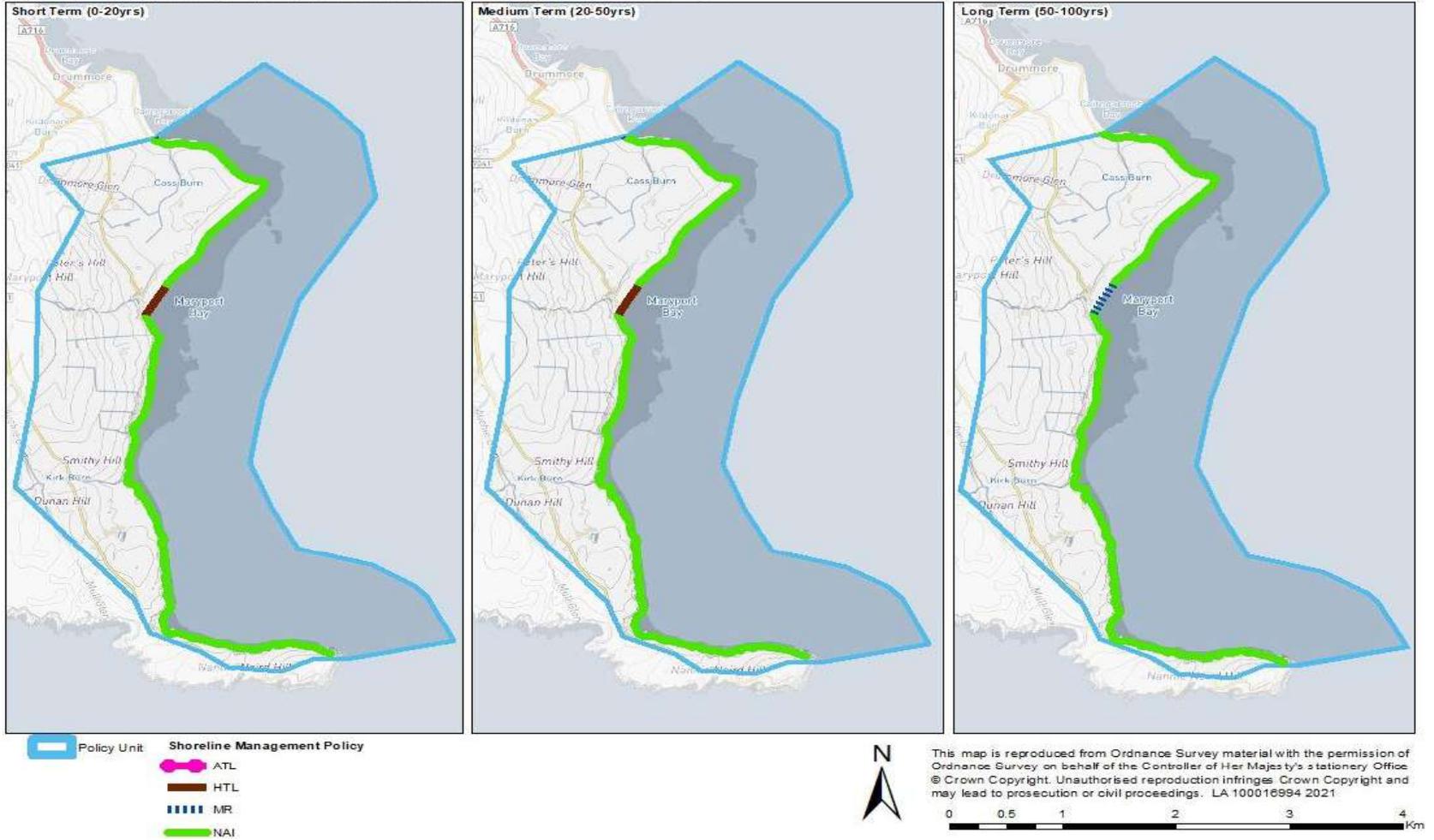
✘ - Reject  
 ✓ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

## APPENDIX D – POLICY STATEMENTS

JUSTIFICATION FOR RETENTION / REJECTION			
<p>SMP05 recommended a No Active Intervention approach for most part of this coastline, with Hold the Line for Maryport.</p> <p>The general policy of No Active Intervention over all epochs should continue to be applied to PU 26. This will allow the shoreline to continue to evolve in response to natural processes.</p> <p>The rock armour revetment that protects the caravan site at Maryport is currently in good condition. The continued maintenance of this defence should be permitted, but any modification or replacement of the existing structure would require consent from NatureScot due to the importance of habitats identified within the intertidal zone.</p> <p>Considering the potential for future impact on cultural heritage features, consultation with Historic Environment Scotland is recommended.</p>			
SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	A*
Managed Realignment	x	A*	C*
No Active Intervention	C	C	C
<p>x - Reject                      C – Consider                      A – Alternative                      *Localised</p>			
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY			
<p>The preferred strategic approach for PU 26 across all epochs is to implement a general policy of No Active Intervention, since the coastal flood and erosion risk associated with this policy unit is low. However the maintenance of the coastal defence (Mary001) should be allowed to continue, subject to private funding being available and all necessary consents being obtained. Over the medium and longer term, it is likely that further works will be required at this location to address the effects of sea level rise. This has the potential to have adverse impacts on the natural evolution of the coastline, disrupting the northerly flow of sediment and sediment supply to beaches located up drift of this area and would therefore require careful investigation, as the area lies within an internationally designated site.</p> <p>It is important to note that any recommendations are subject to the availability of resources to take them forward.</p> <p>The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 26 and across all epochs, as shown in Figure 26.2</p>			
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS			
<p>No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.</p>			
STAKEHOLDER ENGAGEMENT OUTCOME			
<p>The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment at Maryport Bay as presented during the stakeholder engagement was not updated.</p>			

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

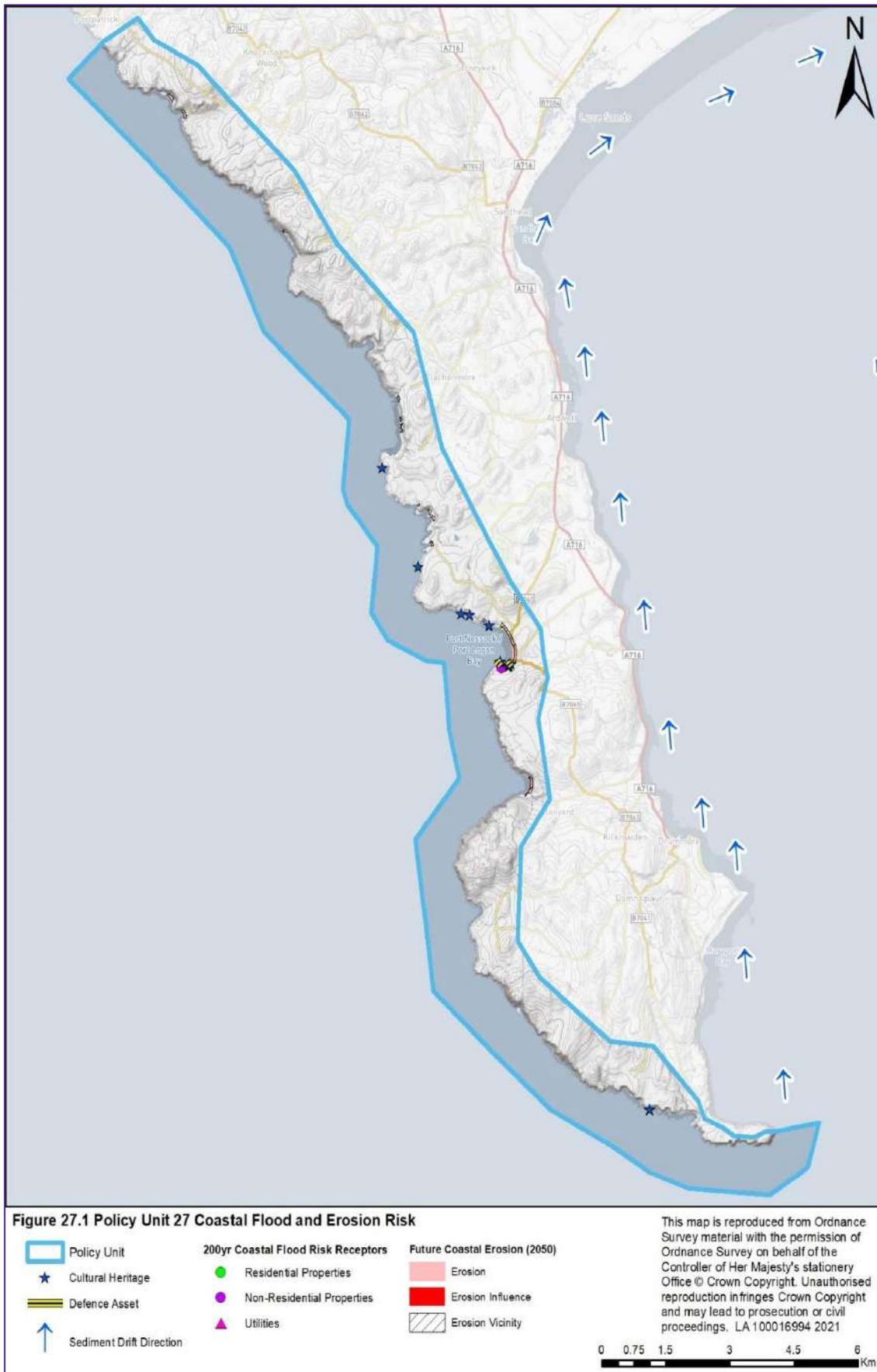
Figure 26.2 Policy Unit 26 Geographical Extent of Preferred Policy (0-100yr) All Epochs



## 6 COASTAL PROCESS UNIT 5

CPU 5 of the SMP, the Western Rhinns, extends from the Mull of Galloway in the south to Milleur Point in the north. There are four policy units within CPU 5 for which the relevant management policies are identified in the following sub-sections.

D5.1 PU 27 – Mull of Galloway to Portpatrick



## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 27 includes a 33km stretch of shoreline extending from the Mull of Galloway (NX160305) to Lagnawinny (NX001536), just south of Portpatrick. This coastline is part of CPU 5 and forms the western shoreline of the North Channel. This part of the Rhinns peninsula is mainly fronted by rocky cliffs, although there are some pocket beaches and bays. This shoreline is relatively remote and isolated.

Port Logan is the main settlement within PU 27.

There are environmentally designated sites within PU 27. The Mull of Galloway SAC and SSSI extend along the coastline from the eastern limits of the Policy unit almost to the Dam Burn, while small sections of the coastline further to the north are designated as SSSIs at Port Logan, Grennan Bay and Morroch Bay.

### FLOOD RISK

Based on the SEPA strategic flood mapping data, it is estimated that no homes or business are currently at risk of medium likelihood coastal flooding. When predicted potential changes due to climate are considered three homes are indicated to be at flood risk.

There is 0.25km of road identified to be a medium likelihood coastal flood risk, including a local street and private (restricted access) road. In the future, when the effects of climate change are considered, it is expected that 0.4km of road will be affected by coastal flooding.

20 hectares of agricultural land is also at risk of medium likelihood coastal flooding. All of this is Improved Grazing. Due to climate change this will increase to 22 hectares. The annual average damage associated with flooding is £16,769.

There is one community facility, the Community Hall at Port Logan, identified to be at medium likelihood coastal flood risk.

There are 11 cultural heritage features including six Listed Buildings located within Port Logan village, two of which are Category B Listed Buildings (Logan Fish Pond and Port Logan Lighthouse Tower). There are also five scheduled monuments including Clanghie Point Fort & Doon Castle at Ardwell.

The seaward edge of a Garden and Designed Landscape (Logan House) is also at medium likelihood coastal flood risk.

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	3
Business Premises	0	0
Utilities	0	0
Community facilities	1	1
Cultural Heritage	11	11
Transport roads (km)	0.25	0.4
Transport rail (km)	0	0
Agricultural Land (ha)	20	22

### Summary of Coastal Flood Risk in PU 27

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.

\*Climate change is based on UKCP09 projections.

**EROSION RISK**

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 27 is a predominantly rocky shoreline with some small areas of accretion as well as erosion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 27 will have advanced seawards by up to 3.29m, whilst others will have receded landwards by up to 5.24m. At Port Logan Bay parts of the coast will recede by up to 7.39m and by 2100 this will increase by up to 12.27m.

By 2050, Dynamic Coast indicates 12 homes, and three businesses will be located within the zone of Erosion Influence, whilst seven homes and two businesses will be located within the Erosion Vicinity. It is also estimated that 0.98km of road is located within the Erosional Area, another 0.15km is located within the Erosion Influence and 1.07km within the Erosion Vicinity. Dynamic Coast has also identified that by 2050 there will be various other assets located within the Erosion Vicinity including Green Space (0.9ha). Scottish Water Assets will also be located within the Erosion Vicinity, including a length of the clean water network (0.5km), gravity pipes (0.1km) and an area of a Sewage Treatment Site (0.4ha).

By 2100, 17 homes are indicated to be located within the Erosion Area, most of these properties are located in Port Logan. It is also anticipated that one home and four businesses are located within the Erosion Influence and two home and four businesses are located within the Erosion Vicinity. By this stage, 0.99km of road will be within the Erosion Area including sections of local road and the B7065. The area of Green Space (0.2ha), Area of Gardens and Designed Landscapes (16.6ha) and extent of Scottish Water Assets located within the Erosional Area are also all increased to clean water network (0.7km), gravity pipes (0.14km) and Sewage Treatment Site (3ha).

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	12	7	0	3	2	0.98	0.15	1.07
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
17	1	2	0	4	4	0.99	0.22	0.66

**Summary of Coastal Erosion Risk in PU 27**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/webmap.html> for further information.

**APPENDIX D – POLICY STATEMENTS**

**EXISTING COASTAL DEFENCE**

There are several coastal defence structures located within PU 27, including a seawall located along the shoreline at the Salt Pan near Port Logan (NX070461), this structure appears to benefit one isolated property (Salt Pans Cottage). There are also coastal defences located at Port Logan including a masonry wall and quay. Some of these are historical features that form part of the character of the village. The presence of these coastal defences benefits the coast road and harbour area within Port Logan. A wall is also located seawards of a property at Port of Spittal Bay (NX020521).

**SUMMARY OF EXISTING COASTAL DEFENCE**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Port Logan Quay (Port001)	Private	Quay	3	None	Port Logan Quay (Listed Building Category B)
Port Logan (Port002)	Council (Roads)	Wall	4	None	Minor Road and private properties (including Listed Buildings Category C)
Port Logan Bay (North) (Plogan001)	Private	Embankment	4	Maintenance required	Private property & access road

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**Port Logan Quay (Port001)**

Port Logan Quay (NX093404) is a Listed Building (Category B), listed features include Port Logan Lighthouse Tower and Pier. These features are also considered as a coastal defence asset.

The asset condition survey described this asset as in fair condition. The quays seaward face is protected with rock armour. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The 2002 Coastal Protection Inventory referred to this asset as owned by Logan Estates.



**Plate 27.1 Port001 (Quay)**

## APPENDIX D – POLICY STATEMENTS

### [Port Logan \(Portl002\)](#)

This 0.13km wall fringes the shoreline along Port Logan village and provides protection to the road and seaward facing properties.

The asset condition survey described this asset as in poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. To the west of this wall there is a raised embankment, carrying the road, there is also pedestrian access to the beach (NX096404). Landwards of this road several shore facing properties (Laigh Row) are located below the road level. The 2002 Coastal Protection Inventory referred to these defences as owned by the Council (Roads).



### [Port Logan \(North\) \(Plogan001\)](#)

This defence asset is described as an embankment composed of rock armour and fringes the shore for approximately 0.02km in the northern corner of Port Logan Bay (NX095413). The presence of this defence benefits a private access road and property located landwards of the shore.

The asset condition survey described this asset as in poor condition. Rock protection has failed, and it no longer covers the full extent of the embankment. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence.

**APPENDIX D – POLICY STATEMENTS**



**Plate 27.3 Plogan001 (Embankment)**

**REVIEW OF MANAGEMENT POLICIES**

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x			Hold the Line is not progressed as there is unlikely to be any economic justification for this policy.
Managed Realignment	✓	✓	?	!	Managed Realignment is progressed, potential environment and heritage impacts are identified, as are some significant social impacts
No Active Intervention	✓	✓	?	!	No Active Intervention is progressed, potential environment and heritage impacts are identified, as are some significant social impacts

x - Reject  
 ✓ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

**JUSTIFICATION FOR RETENTION / REJECTION**

SMP05 suggested a policy option of No Active intervention for the most part of this policy unit, with selective Hold the Line applicable to Port Logan, across all epochs.

For the most part of PU 27, continuation of a policy of No Active Intervention is proposed due to the remoteness and generally hard rock nature of the coastline.

At Port Logan there are a series of existing coastal defences, and while continuation of the existing Hold the Line policy is recommended for the short term it is unlikely to attract a significant government funding. In the short term these defences should therefore be maintained involving a patch and repair approach.

In the longer term it is likely to be more sustainable to allow the Standard of Protection afforded by these structures to diminish and move towards a policy of Managed Realignment.

## APPENDIX D – POLICY STATEMENTS

The identification of a sustainable Managed Realignment approach for Port Logan will require more detailed investigation. Managed Realignment has potential to lead to significant social impacts relating to damage to or loss of properties. Consultation with Historic Environment Scotland will also be required regarding the potential impact to Port Logan Lighthouse and Pier.

Consideration also needs to be given to the combined effects of fluvial, pluvial and coastal flooding on the flood risk within Port Logan.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	C*	C*
Managed Realignment	A	A	A
No Active Intervention	C	C	C

x – Reject  
 C – Consider  
 A – Alternative  
 \* – Localised approach

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred policy for the majority of PU 27 is No Active Intervention, due to the predominantly undeveloped nature of the coastline. However when applying this policy consideration should be given to permitting the maintenance of localised coastal defences where they do not influence the long term evolution of the coastline.

At Port Logan, a localised Hold the Line policy should be considered over the short to medium term. The patch and repair of defences should continue, subject to available funding, Listed Building consent for Port Logan Quay is required, therefore consultation with Historic Environment Scotland is recommended.

At Port Logan, longer term Managed Realignment options should also be considered as an alternative policy, this may include the relocation of residents from low-lying properties situated along Laigh Row. In the past, following the construction of the causewayed road fronting these properties (1820s), the then residents preferred not to be relocated to the Upper Road, since the road provided shelter from onshore wind. Considering future sea level rise, retreat to higher land or elsewhere is likely to be the only viable long-term option as sea level rise will increase the frequency of damaging extreme high water levels.

While coastal flooding is expected to increase, in the shorter term economic and social impact may be reduced through the implementation of resistance / resilience measures. SEPA strategic flood mapping data indicates that future medium likelihood coastal flooding depths could exceed 0.3m (1ft) at some properties in Port Logan. Depending upon the character of the property, water exclusion approaches may be acceptable, however, the effectiveness of such mitigation measures may be reduced in coastal flooding situations. Properties that are Listed Buildings, may require consent and consultation with Historic Environment Scotland is therefore recommended.

It is noted that consideration needs to be given to the combined effects of fluvial, pluvial and coastal flooding on the flood risk within Port Logan. A previous Flood Protection Scheme (1986) was undertaken to alleviate flooding from an unnamed tributary.

Any measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

The preferred policy of No Active Intervention should be applied to the majority of the coastal extent of PU 27 and across all epochs, as shown in Figure 27.2. Consideration should be given to allowing the

## APPENDIX D – POLICY STATEMENTS

continued maintenance of localised coastal defences at Port Logan where they do not influence the long term evolution of the coastline. Managed Realignment should be considered as an alternative management approach.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

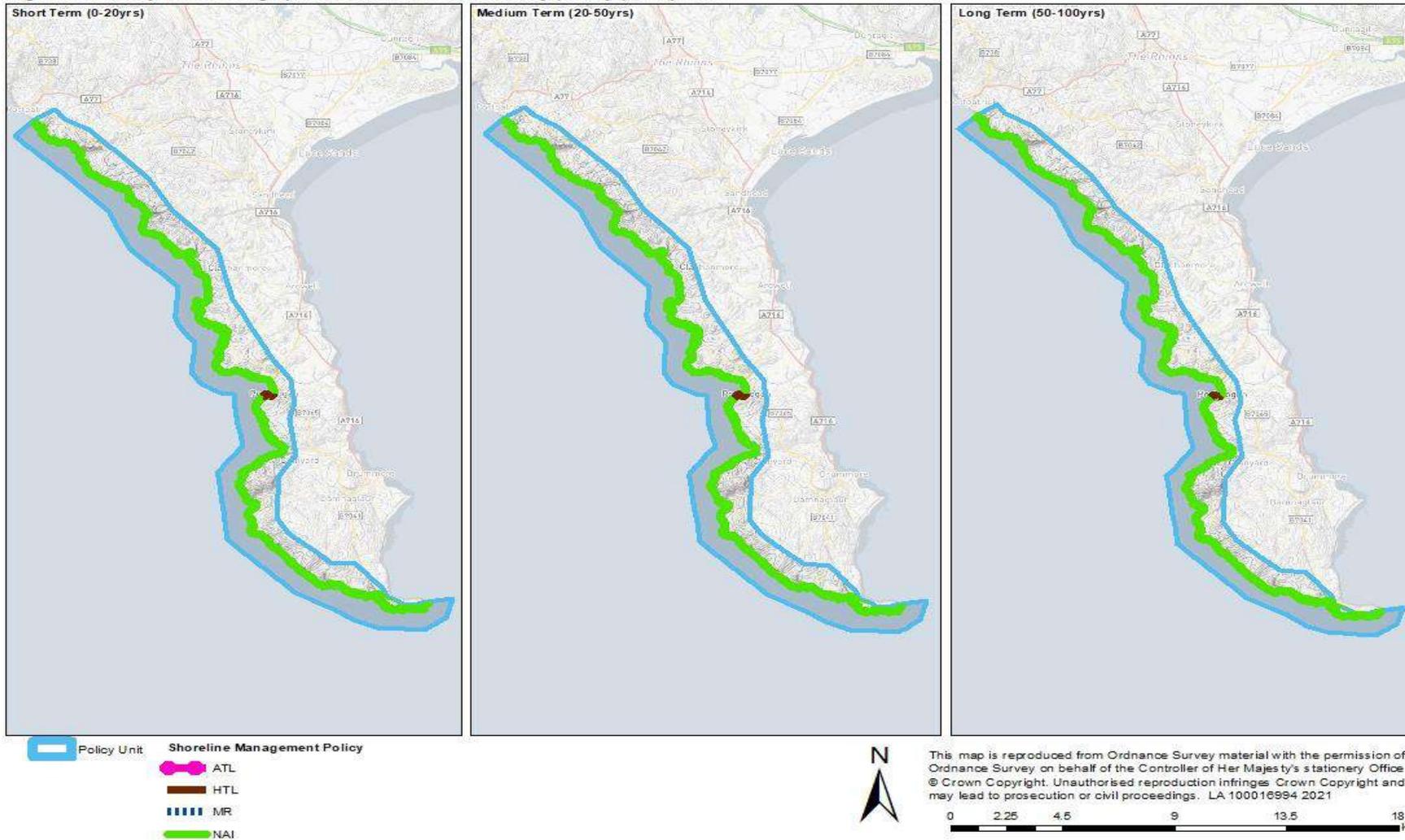
The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 27, the Preferred Policy has not changed.

### STAKEHOLDER ENGAGEMENT OUTCOME

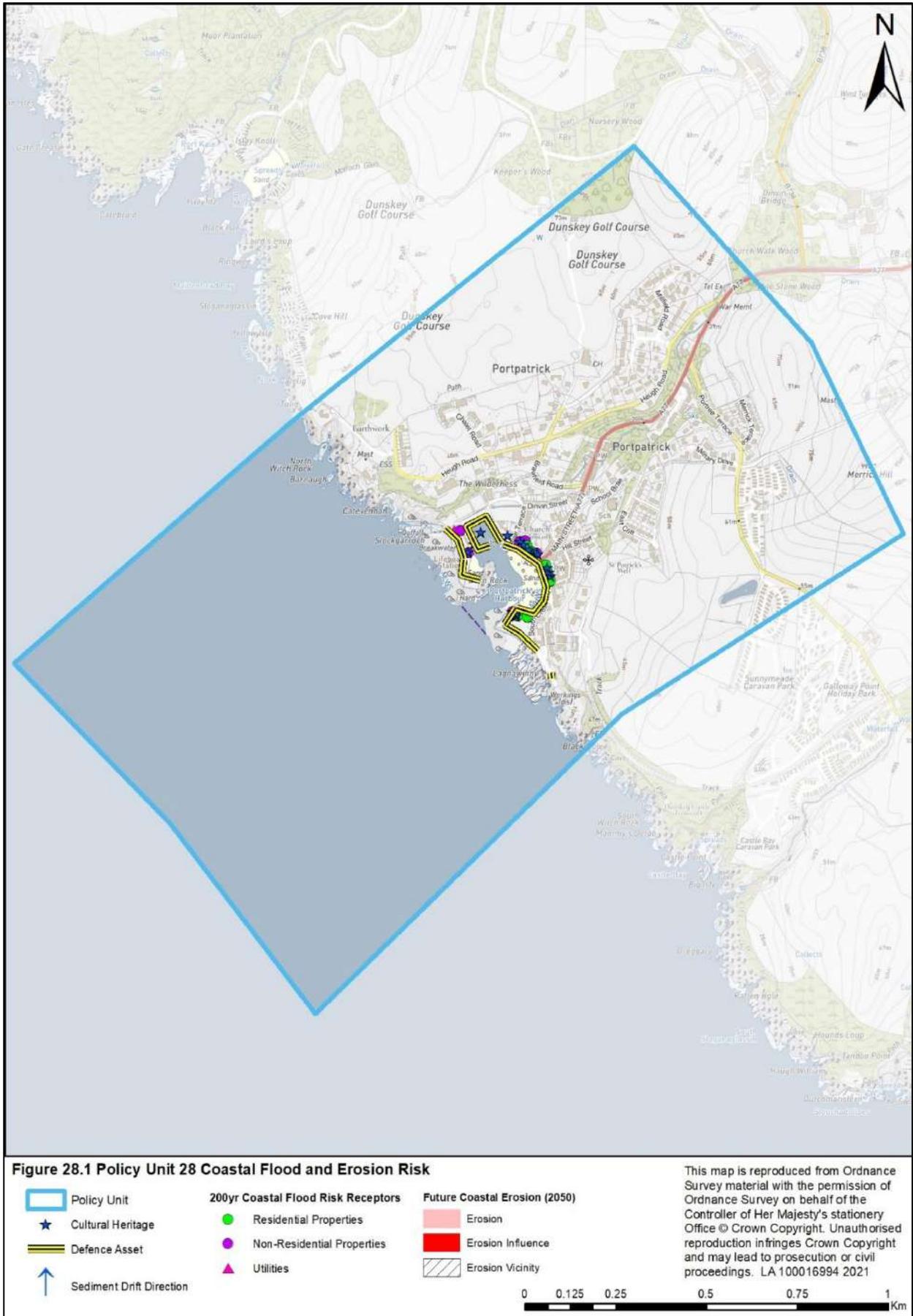
The Preferred Policy, of No Active Intervention with localised Hold the Line at Port Logan as presented during the stakeholder engagement was not updated. Figure 27.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 27.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 27.2 Policy Unit 27 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D5.2 PU 28 – Portpatrick



## APPENDIX D – POLICY STATEMENTS

### DESCRIPTION OF POLICY UNIT

PU 28 includes approximately 1.5km of shoreline extending from Lagnawinny (NX001536) to north of Portpatrick (NW993544). This policy unit is located within CPU 5 and faces the North Channel, making it susceptible to wave overtopping, particularly during severe westerly storms. The shoreline of PU 28 is mainly rocky or defended with some sand and gravel exposed during low-tide.

The main settlement within PU 28 is Portpatrick located within an incised cove and natural harbour area. Portpatrick is fronted by a harbour with a narrow and shallow entrance that is fringed by rocks on both sides. There are a series of seawalls at Portpatrick, protecting the coastal road and car parks. The frontage of Portpatrick is protected by a harbour breakwater and described as an artificial frontage.

SEPA has designated Portpatrick as an Objective Target Area. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.

### FLOOD RISK

Based on SEPA strategic flood mapping data, there are eight homes and eight business premises currently at risk of medium likelihood coastal flooding. When predicted potential changes due to climate change were considered, this increased to nine homes and 13 business premises estimated to be at coastal flood risk.

In addition, approximately 0.43km of mainly minor road (Local Streets), including South Crescent Road is presently shown to be at flood risk. A small area (0.007km) of Main Street (A77) is also affected. In the future, due to the anticipated impacts of climate change, 0.51km of road will be affected, this includes mainly minor roads with no further increase to the length of Main Street (A77) affected.

There is also one utility asset at coastal flood risk with no additional utilities affected due to climate change.

No areas of agricultural land are affected by flooding. The annual average damage associated with flooding is £16,769.

Portpatrick is a designated Conservation Area, approximately 0.2km<sup>2</sup> of this area is at risk of medium likelihood coastal flooding, this increase to 0.3km<sup>2</sup> in the future, due to climate change. Within this area a total of 15 cultural heritage assets are at risk, including Listed Buildings (Category B) situated around Portpatrick Harbour, and Listed Buildings (Category C) located along North and South Crescent. In the future, no additional cultural heritage assets will be impacted.

Wave overtopping is likely to significantly increase the number of properties at risk from coastal flooding within Portpatrick and should be investigated further.

## APPENDIX D – POLICY STATEMENTS

Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	8	9
Business Premises	8	13
Utilities	1	1
Community facilities	1	2
Cultural Heritage	15	15
Transport roads (km)	0.43	0.51
Transport rail (km)	0	0
Agricultural Land (ha)	0	0

### Summary of Coastal Flood Risk in PU 28

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown. However, no coastal erosion risk has been identified within PU 28.

The harbour entrance at Portpatrick has changed over time, during the 1770's the construction of breakwaters enclosed the harbour. During the 1820s, the North and South piers were added, although the original North pier was destroyed by 1839. The inner basin was constructed in 1861. Only remnants of the North and South Pier remain, with both substantially removed by the 1970s. Refer to <https://www.dynamiccoast.com> for further details relating to the Dynamic Coast project.

### EXISTING COASTAL DEFENCES

The frontage of Portpatrick is heavily defended by a series of coastal defence structures some of which are listed as cultural and heritage assets.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Dunskey Street (Pp001)	Private	Promenade	4	Monitor condition.	Adjacent minor road and sheds
South Crescent Carpark (Pp002)	Council (Roads)	Wall	3	None	South Crescent & Carpark
South Crescent Carpark (Pp003)		Promenade	5	Monitor condition of exposed face and crest one on overall asset stability.	

**APPENDIX D – POLICY STATEMENTS**

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
South Crescent (Pp004)	Council (Roads)	Promenade	2	Monitor the growth on the exposed face and its effect on its stability.	South Crescent Road and adjacent properties
South Crescent (Pp005)		Wall	3	Replace capping stone or repair to original crest height.	
Portpatrick Quay (Pp006)	Council (Roads)	Quay	4	Monitor condition of quay faces on overall asset stability.	
North Crescent (west)(Pp007)	Council (Roads)	Wall	3	None	North Crescent Road & Quay
North Crescent (west) (Pp008)		Wall	3	None	
North Crescent (west) (Pp009)		Wall	3	Monitor condition of seaward toe and repair as required.	

Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

**South Crescent (Pp001)**

This 16m promenade fringes the shoreline to the south-west of Portpatrick and provides protection to private garages at South Crescent. The asset condition survey described this asset as in poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. It is presumed that this coastal defence is privately owned.



**Plate 28.1 Pp001 (Promenade)**

[South Crescent Carpark \(Pp002-Pp003\)](#)

This 170m wall and promenade fringes the shoreline of South Crescent Carpark and provides protection to the carpark and South Crescent. The asset condition survey described the wall (Pp002) as in fair condition, whilst the promenade (Pp003) was in very poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. It is recommended that the stability and condition of this asset are monitored. It is presumed that these are Council (Roads) owned coastal defence assets.



Plate 28.2 Pp002 (Wall and Promenade)

South Crescent (Pp004-Pp005)

A 270m promenade fringes the shoreline of South Crescent (Pp004), whilst a 40m wall (Pp005) is located towards the northern extent of South Crescent near North Crescent. These coastal protection assets benefit the shore road and adjacent properties (town frontage). The asset condition survey described the promenade as in good condition (Pp004), and the wall (Pp005) to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences. It is recommended that vegetation growth along the exposed face of the promenade is monitored and repair of the wall is undertaken. It is noted that the exposed nature of this coast means that there is a risk of wave overtopping at South Crescent. The 2002 Coastal Protection Inventory referred to these defences as being Council (Roads) owned.



Plate 28.3 a. Pp004 (Promenade) & b. Pp005 (Wall)

### [Portpatrick Quay \(Pp006\)](#)

Portpatrick Quay (Pp006) is located towards to the north of Portpatrick. SMP05 described this quay as very sheltered and largely sediment free. The presence of these assets benefit the northern harbour area of Portpatrick. This Quay is also a Listed Building (Category B). The asset condition survey described the quay as in poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. It is recommended that the quay face and overall asset stability is monitored. The 2002 Coastal Protection Inventory referred to these defences as being Council (Roads) owned.

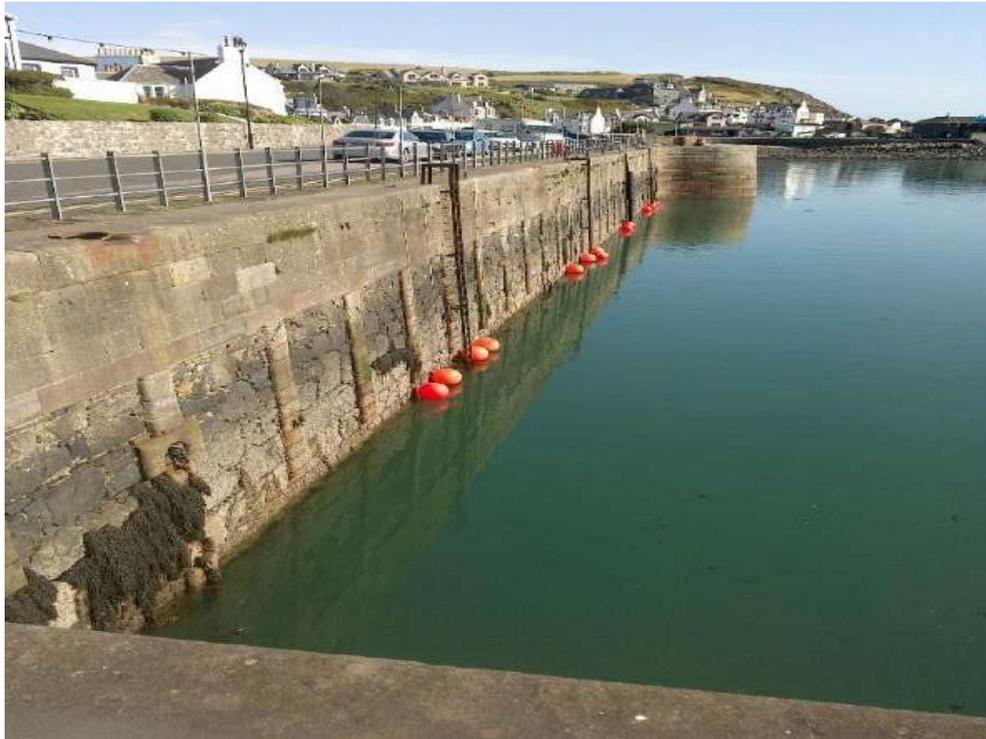


Plate 28.4 Pp006 (Quay)

### [North Crescent \(Pp007- Pp009\)](#)

The North Crescent coastal defences are located towards to the north of Portpatrick. The overall asset is described as being in fair condition. The presence of these walls benefit the northern harbour area of Portpatrick, including a Listed Building (Category B). Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. A 130m section of this wall (Pp009) is a concrete stepped seawall that joins the mainland to a small islet thus giving enclosure to the harbour. The condition asset survey recommended that the seaward toe of this wall is monitored and repaired as required. The 2002 Coastal Protection Inventory referred to these defences as being Council (Roads) owned.

APPENDIX D – POLICY STATEMENTS



Plate 28.5 Pp009 (Wall) a. North Crescent (west) b. North Crescent (seaward toe)

REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				There is no justification for Advance the Line in this Policy unit.
Hold the Line	✓	x	?	!	Hold the Line is progressed for the short to medium term, however its sustainability over the long term is questionable. With this option there will be social and environmental impacts.
Managed Realignment	✓	✓	!	!	Managed Realignment is progressed for the medium to long term due to the increased risk associated with climate change. There are social and heritage issues.
No Active Intervention	✓	✓	✓	✓	No Active Intervention is considered appropriate in this policy unit, where there is no need to maintain existing flood / erosion risk management measures.

x - Reject  
 ✓ - Progress  
 ? - Progress, however potential for impacts identified  
 ! - Progress, however potential for significant impacts identified

JUSTIFICATION FOR RETENTION / REJECTION:

SMP05 suggested a policy of Hold the Line across all epochs. This included the regular monitoring of walls, including the outer harbour breakwaters.

## APPENDIX D – POLICY STATEMENTS

Portpatrick is currently protected by a series of coastal defences and the character of the village depends upon the existence of the harbour area. However, it will be increasingly challenging to justify continued maintenance and upgrade of the existing coastal defences as a flood risk management measure with increasing sea levels.

Managed Realignment should therefore be considered as it may be a more sustainable option, however it is recognised that this strategy may be challenging to implement due to the lack of space to set back and the recognised importance of the harbour side area to Portpatrick as a tourist destination.

Consultation with Historic Environment Scotland is required regarding the impact to Portpatrick, due to the potential impacts on heritage and landscape features associated with this area, which include the Lighthouse and other historic features of the village.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	A	x
Managed Realignment	x	C	C
No Active Intervention	C*	C*	C*

x – Reject

C – Consider

A – Alternative

\*- Applies to sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures.

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred shoreline management approach for PU 28 is Hold the Line for the short term, with the flood and erosion risk managed by maintaining the existing defences and harbour structures. In the longer term this approach will become more challenging to sustain both technically and financially. SMP05 notes that there are opportunities to upgrade defences and make them more efficient, but at a considerable cost. However, the consideration of wave overtopping impacts may help provide justification for such a policy in the medium to long term.

Consideration should be given to the adoption of a Management Realignment policy over the medium to long term, although it will be challenging to accommodate any localised set back defence line within the restricted area available at the Harbour. While coastal flooding is expected to increase, in the shorter term limited economic and social impact may be mitigated through implementation of resistance / resilience measures. SEPA strategic flood mapping data indicates that medium likelihood coastal flooding depths range between 0.11m to 1.8m. In the future, medium likelihood coastal flooding depths will range between 0.4m to 2.3m. Considering the more extreme flood depths, the successful application of mitigation measures is likely to be limited. It is also noted that the effectiveness of such mitigation measures may be reduced in coastal flooding situations. Properties that are Listed Buildings, may require consent and consultation with Historic Environment Scotland is therefore recommended.

SEPA is currently undertaking research to better understand the risk that large waves have on coastal flood risk in Scotland. The selection of the most appropriate policy over the medium to long term should be reviewed on completion of this study or a detailed study of the wave over-topping risk to Portpatrick.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

It should be noted that No Active Intervention should be applied to sections of the undeveloped shoreline, where there is no need to maintain existing flood and / or erosion risk management measures.

## APPENDIX D – POLICY STATEMENTS

Hold the Line applies to the shoreline at Portpatrick and over the short term, with No Active Intervention elsewhere. Over the medium and long-term Managed Realignment should be considered as an alternative approach, as shown in Figure 28.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

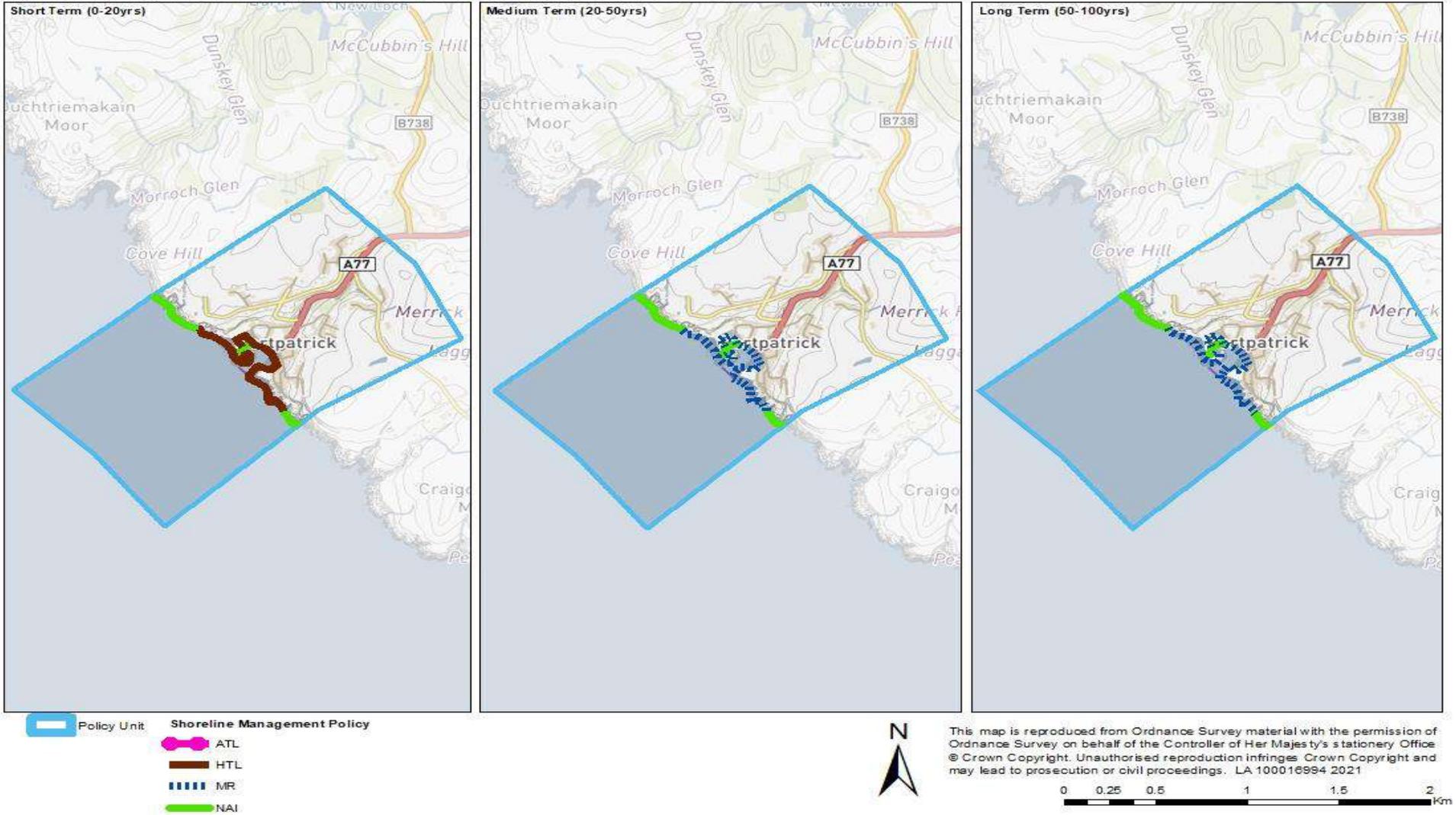
The Dynamic Coast second phase data has been considered as part of this SMP and indicates that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 28.

### STAKEHOLDER ENGAGEMENT OUTCOME

While a 'Preferred Policy' of Hold the Line over the short term leading to a longer term policy of Managed Realignment remains, although a refinement was introduced recommending No Active Intervention for sections of the shoreline where there is no need to maintain existing flood and erosion risk management measures. Figure 28.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 28.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 28.2 Policy Unit 28 Geographical Extent of Preferred Policy (0-100yr) All Epochs



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D5.3 PU 29 – Portpatrick to Milleur Point

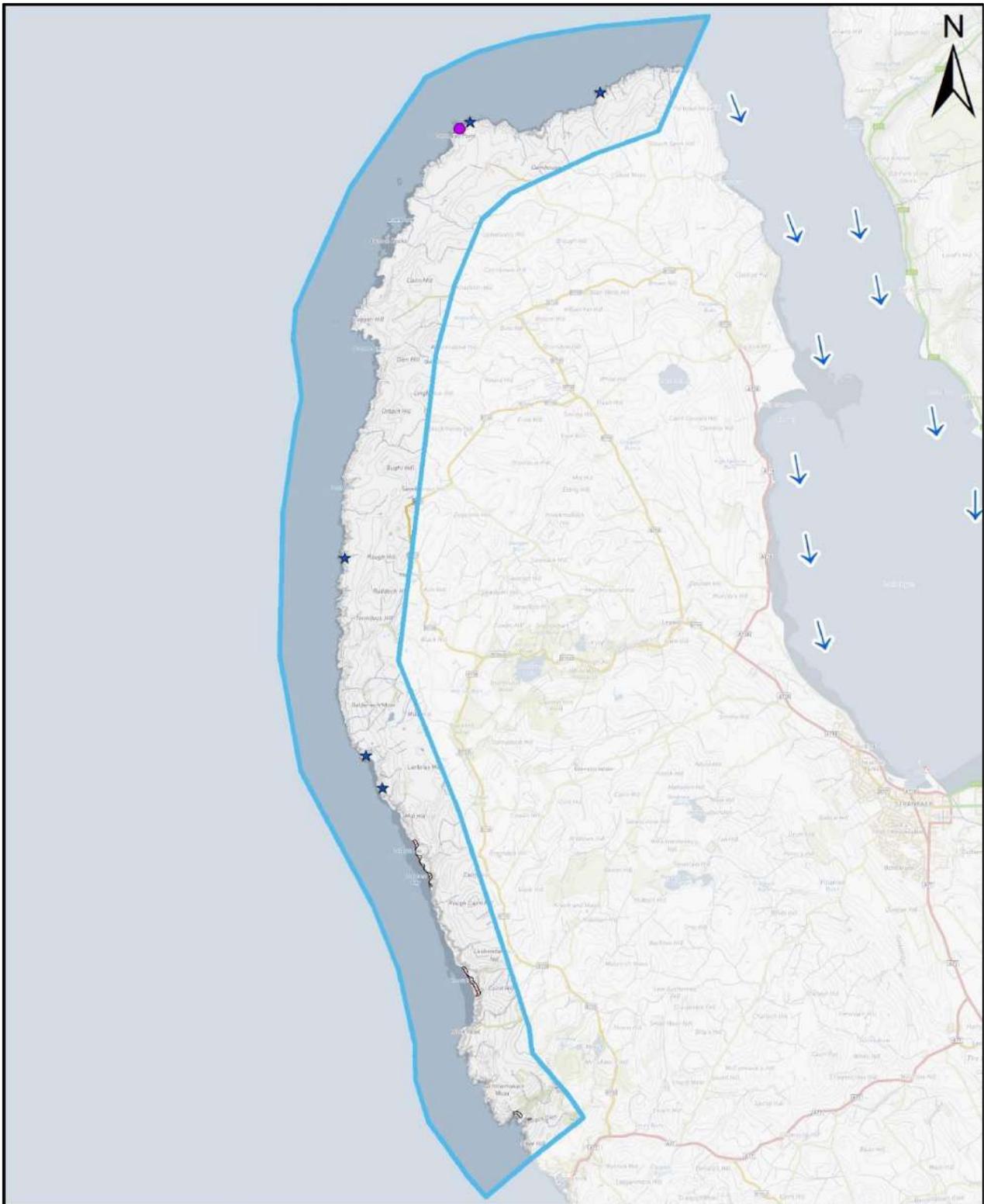


Figure 29.1 Policy Unit 29 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 29, encompasses the northern part of the Rhinns peninsula, from north of Portpatrick (NW993544) to Milleur Point (NX021738). This policy unit is located within CPU 5 and faces the North Channel, making it susceptible to wave action, particularly during severe westerly storms. This section of shoreline is approximately 26km long and is dominated by rocky cliffs, wide rocky platforms, and intermittent sandy beaches. This coastline is remote and sparsely developed. There are small areas of low coastal dune located at the back of some bays, possibly formed from the reworking of raised beaches and sediment orientating from the hinterland.</p> <p>There are two environmentally designated sites within PU 29; Salt Pans Bay SSSI and Corsewall Point to Milleur Point SSSI.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data there are no homes at medium likelihood coastal flood risk. However, one business is identified to be at a flood risk, with no further increase expected by 2080 when climate change is considered.</p> <p>0.65 hectares of agricultural land is also at risk of medium likelihood coastal flooding. This is mainly Improved and Rough Grazing. Due to climate change this will increase to 0.8 hectares. The annual average damage associated with flooding is £25.</p> <p>There are five cultural heritage assets are identified to be potentially at flood risk, both today and in the future, these are all scheduled monuments mainly including ancient fortifications and a farmstead.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	1	1
Utilities	0	0
Community facilities	0	0
Cultural Heritage	5	5
Transport roads (km)	0	0
Transport rail (km)	0	0
Agricultural Land (ha)	0.65	0.8
<b>Summary of Coastal Flood Risk in PU 29</b>		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 29 is a predominantly rocky coastline with only small areas of accretion as well as erosion. Dynamic Coast estimates that by 2030 parts of the shoreline of PU 29 will have advanced seawards by up to 3.27m, whilst others will have receded landwards by up to 6.52m.</p> <p>There is no coastal erosion risk to assets identified within PU 29.</p>		

## APPENDIX D – POLICY STATEMENTS

EXISTING COASTAL DEFENCES					
There are no coastal defence assets associated with PU 29.					
REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No justification for Hold the Line in this policy unit.
Managed Realignment	x				No opportunity for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	✓	Progress No Active Intervention policy. No potential impacts identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
SMP05 recommended a policy of No Active Intervention.  An approach of No Active Intervention should continue to apply to PU 29. The shoreline should be allowed to continue to evolve under natural processes by the application of a do nothing approach.  Consultation with Historic Environment Scotland may be required, due to the potential for impact on heritage and landscape features associated with PU 29. Generally, Historic Environment Scotland have advised that the owners of scheduled monuments should be encouraged to maintain or improve the management of these sites, even though they have no duty to do so and consent is also required.					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	x	x	x		
Hold the Line	x	x	x		
Managed Realignment	x	x	x		
No Active Intervention	C	C	C		
x – Reject C – Consider A – Alternative					
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY					
The preferred policy across all epochs is to implement a policy of No Active Intervention since there is no significant risk associated with PU 29. Consultation with Historic Environment Scotland is recommended, due to potential for impacts on heritage and landscape features associated with this Policy unit. Generally,					

## APPENDIX D – POLICY STATEMENTS

Historic Scotland have advised that the owners of scheduled monuments should be encouraged to maintain or improve the management of these sites.

The preferred policy of No Active Intervention should be applied to the entire coastal extent of PU 29 and across all epochs, as shown in Figure 29.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 29, the Preferred Policy has not changed.

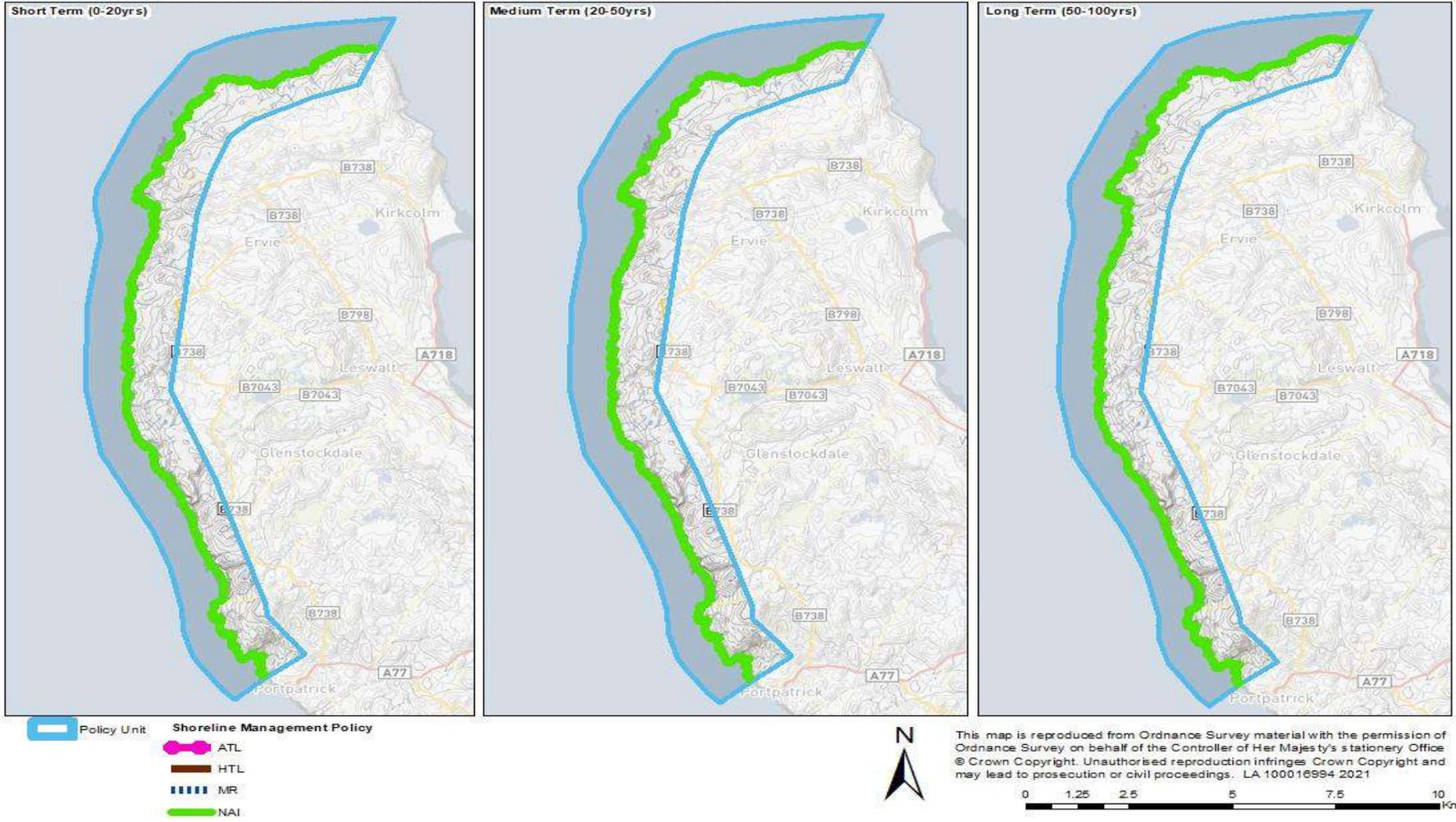
### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy of No Active Intervention across all epochs, as presented during the stakeholder engagement was not updated.

APPENDIX D – POLICY STATEMENTS

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

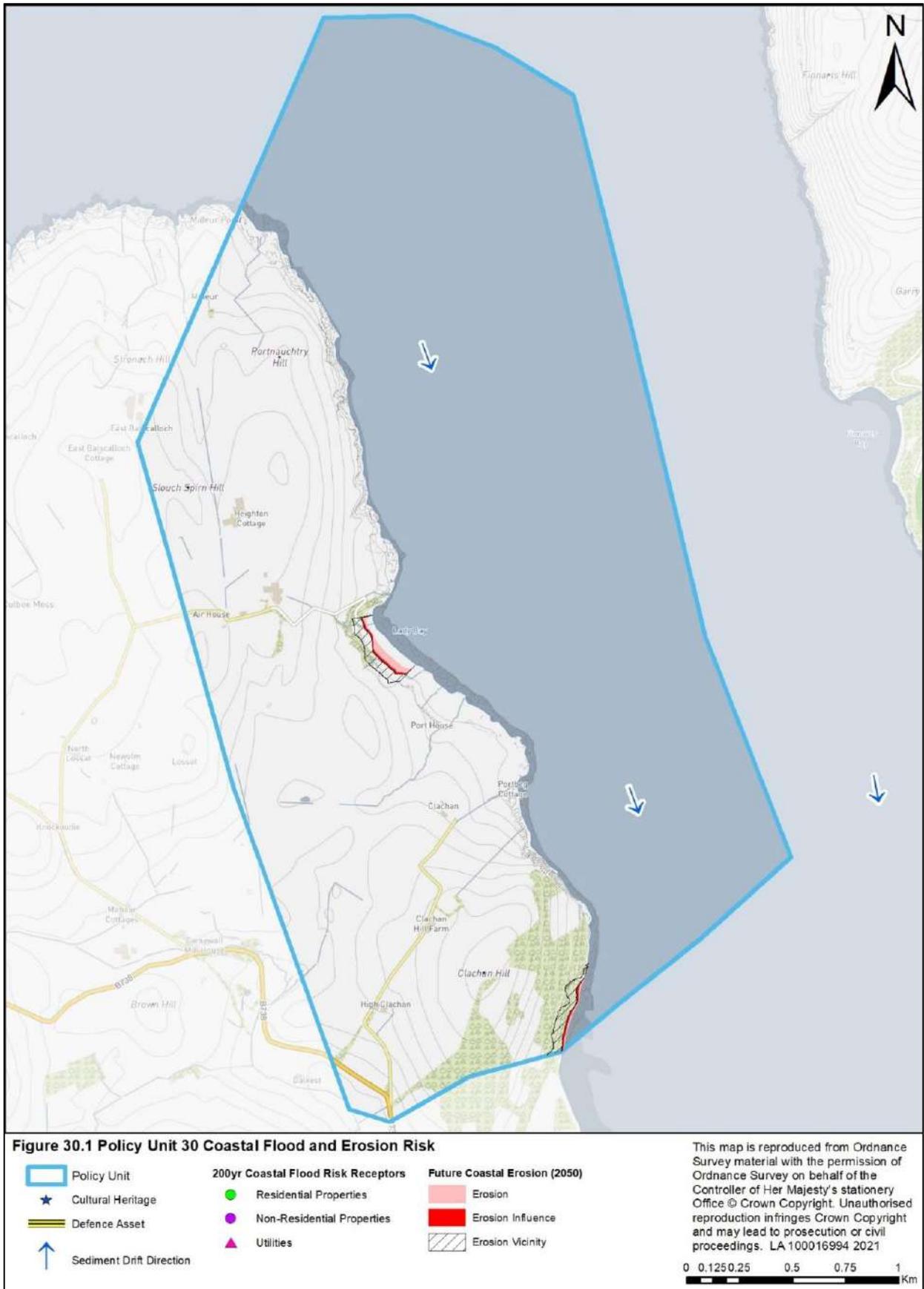
Figure 29.2 Policy Unit 29 Geographical Extent of Preferred Policy (0-100yr) All Epochs



## 7 COASTAL PROCESS UNIT 6

CPU 6 of the Dumfries & Galloway SMP, Loch Ryan, extends from Milleur Point in the west to the Galloway Burn and the administrative boundary with South Ayrshire in the east. There are six policy units within CPU 6 for which the relevant management policies are identified in the following sub-sections.

D6.1 PU 30 – Milleur Point to Kirkcolm



## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 30 encompasses the section of the Dumfries &amp; Galloway coastline between Milleur Point (NX021738) and the Fox Plantation at Kirkcolm (NX035696) and includes approximately 4.6km of the western shoreline of Loch Ryan and is part of CPU 6. This area is not fully exposed to waves generated in the Irish Sea and also experiences lower tidal currents compared to the open coast conditions of the adjoining CPU 5.</p> <p>Loch Ryan is an important natural harbour for shipping, with regular ferry services to Northern Ireland operating from it and is a designated shellfish area.</p> <p>This shoreline is mainly composed of rocky cliffs with some areas of pocket beach including at Lady Bay. The pocket beaches are typically composed of soft and erodible material, backed by raised beach deposits. At low tide, areas of low rock platform are also exposed.</p> <p>There are several isolated properties located along this section of the coast while the general hinterland is dominated by agriculture. There are no coastal defences associated with PU 30.</p> <p>Milleur Point in the north of the policy unit is within the SSSI of Corsewall Point to Milleur Point.</p>		
FLOOD RISK		
<p>Based on the SEPA strategic flood mapping data there are no properties or assets at medium likelihood coastal flood risk either today or in the future.</p> <p>However, 1.2 hectares of agricultural land is at risk of medium likelihood coastal flooding. Most of this is Improved Grazing. Due to climate change this will increase to 1.5 hectares.). The annual average damage associated with flooding is £64.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	0	0
Transport rail (km)	0	0
Agricultural Land (ha)	1.2	1.5
Summary of Coastal Flood Risk in PU 30		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 30 has a relatively hard shoreline with only small areas of accretion and erosion, however Dynamic Coast estimates that by 2030 parts of the shoreline of PU 30 will recede landwards by up to 11m. By 2050</p>		

**APPENDIX D – POLICY STATEMENTS**

it is anticipated that soft parts of this shoreline will become predominately erosional, receding by up to 12m along Lady Bay although by 2100 it will have increased to 13m.

By 2050, 0.22km of road will be located within the Erosion Area, 0.12km within the Erosion Influence and 0.53km within the Erosion Vicinity. The access road leading to Lady Bay is mainly affected. No other assets are identified to be at risk of coastal erosion.

Assets located within the Erosion Area and Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0.22	0.12	0.53
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0.23	11.9	0.53

**Summary of Coastal Erosion Risk in PU 30**

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

**EXISTING COASTAL DEFENCE**

There are no formal coastal erosion or flood defences associated with PU 30.

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No justification for Hold the Line in this policy unit.
Managed Realignment	x				No opportunity for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	✓	Progress No Active Intervention policy. No potential impacts identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
SMP05 recommended a policy of No Active Intervention.  A Policy of No Active Intervention should continue to be applied to PU 30. The shoreline should be allowed to continue to evolve under natural processes by adopting a do nothing approach. The implementation of this policy should however give consideration to allowing landowners to maintain informal or private defences if required.					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	x	x	x		
Hold the Line	C*	C*	x		
Managed Realignment	x	A*	C*		
No Active Intervention	C	C	C		
x – Reject C – Consider A – Alternative *Localised					
SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY					
The preferred management policy for PU 30 is No Active Intervention, this policy should be applied to the majority of the coastal extent of PU 30 and across all epochs, as shown in Figure 30.2. The application of this policy should however allow for the continued maintenance of any existing localised coastal defence by landowners.					
POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS					
No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.					

## APPENDIX D – POLICY STATEMENTS

The Dynamic Coast second phase data has been considered as part of this SMP and although it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 30 the Preferred Policy has not changed.

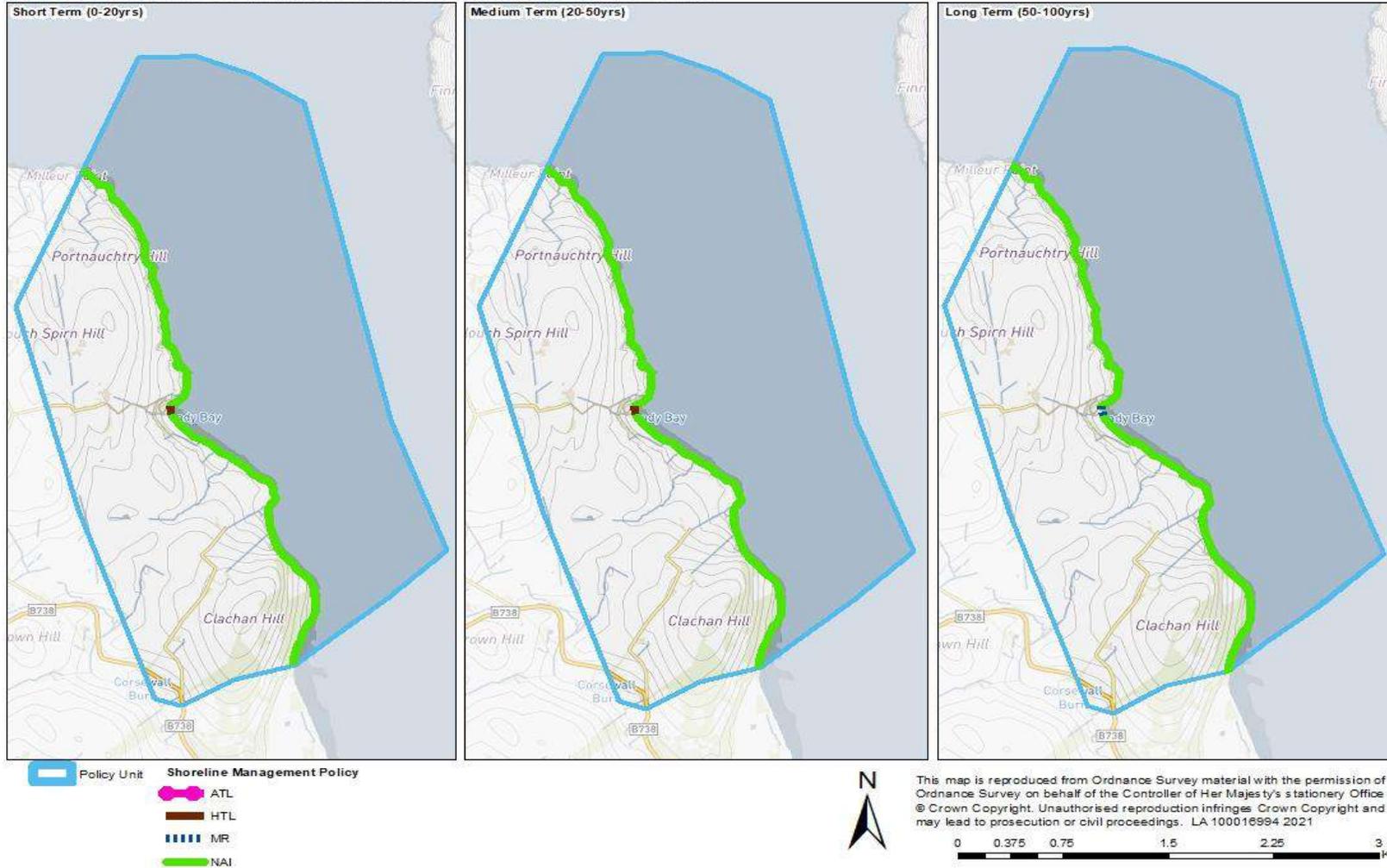
### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment where there are existing landowner defences as presented during the stakeholder engagement was not updated. Figure 30.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 30.

APPENDIX D – POLICY STATEMENTS

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 30.2 Policy Unit 30 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D6.2 PU 31 – Kirkcolm to McCulloughs Point

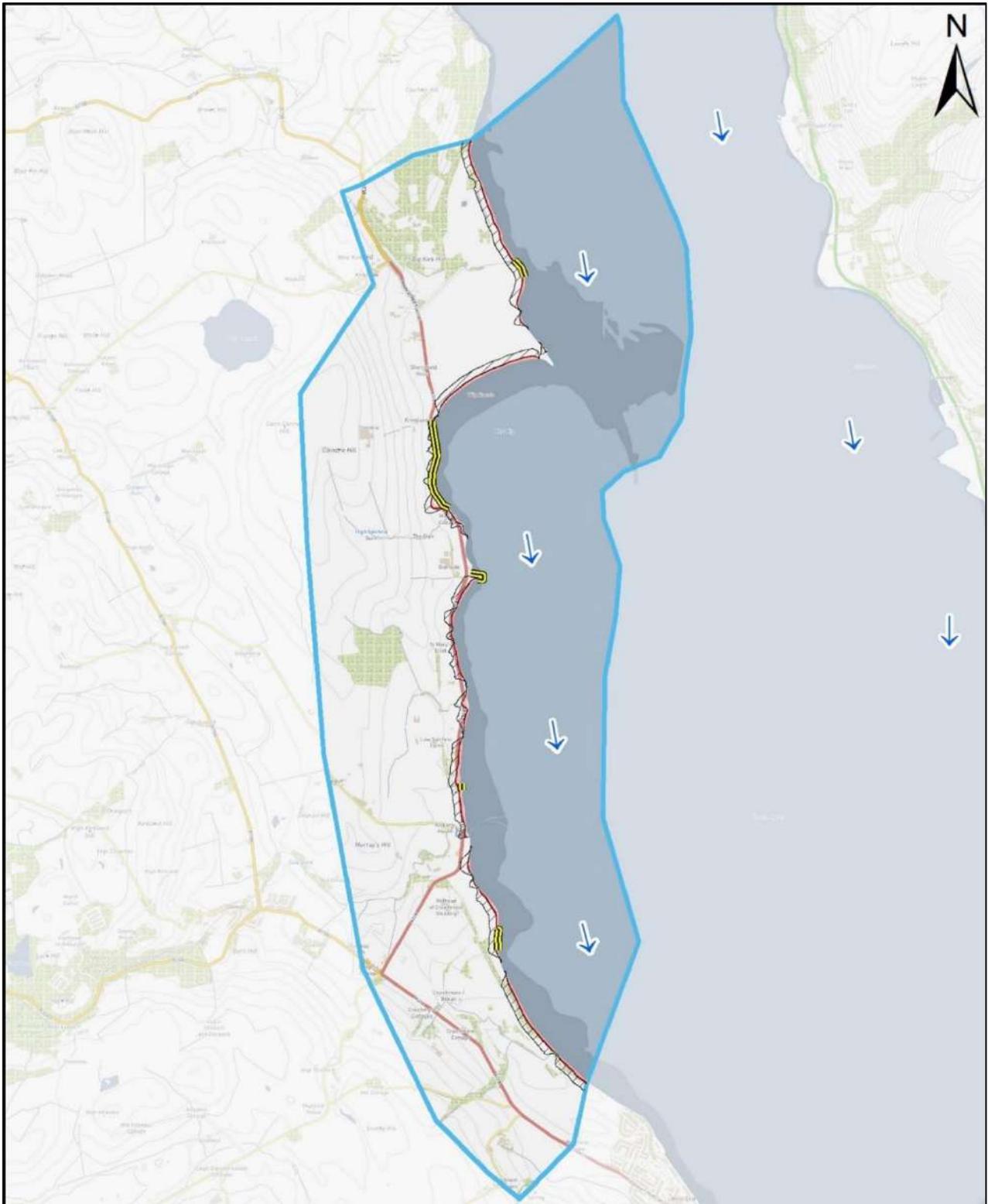


Figure 31.1 Policy Unit 31 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 31 includes approximately 8km of the low-lying western shoreline of Loch Ryan and extends from the Fox Plantation at Kirkcolm (NX035696) to McCullochs Point (NX045628). This section of shoreline is mainly composed of soft (erodible) sediment and is part of CPU 6.</p> <p>Kirkcolm is the main settlement associated with PU 31, although there are also a number of isolated properties and other small hamlets.</p> <p>To the south of Kirkcolm there is a gravel dominated promontory, The Wig, which influences the wave climate along this section of shoreline. At low tide a relatively wide area of sand and gravel beach is exposed along almost the entire frontage of PU 31. Landward of the existing shoreline the coast is characterised by raised beaches.</p> <p>Lough Ryan is a designated shellfish area.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data no homes or businesses are currently shown at risk of medium likelihood coastal flooding. When predicted potential changes due to climate change was considered, one home was estimated to be at flood risk.</p> <p>Approximately 3.4km of road is presently shown to be at flood risk, increasing to 4.3km, due to the anticipated impacts of climate change. Flooding mainly affects the A718.</p> <p>16 hectares of agricultural land is also at risk of medium likelihood coastal flooding. All of this is Improved Grazing. Due to climate change this will increase to 21 hectares.</p> <p>The annual average damage associated with flooding is £566,275.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	1
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	3.4	4.3
Transport rail (km)	0	0
Agricultural Land (ha)	16	21
Summary of Coastal Flood Risk in PU 31		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p>		

## APPENDIX D – POLICY STATEMENTS

PU 31 is a dynamic shoreline with areas of accretion as well as erosion, however Dynamic Coast estimates that by 2030 parts of the shoreline of PU 31 will recede landwards by up to 12m. The small areas of accretion will become increasingly confined by 2100, with erosion becoming more dominant including at Marian Port where sediment presently accumulates to the north of the slipway.

By 2050, one home will be located within the Erosion Influence and one home within the Erosion Vicinity, while 0.23km of road will be within Erosion Area, 0.36km within the Erosion Influence and 1.78km within the Erosion Vicinity. The A718 that runs alongside the shoreline will be impacted by coastal erosion. Other assets identified to be within the Erosion Vicinity at this time include an area of Green Space (5ha), an area of Golf Course (5.2ha). There will also be Scottish Water Assets within the Erosion Vicinity including a length of the clean water network (0.96km) and rising mains (0.55km).

By 2100, one home will be located within the Erosional Area and one home within the Erosion Vicinity, while Green Space (2.9ha) and part of the Golf Course (3ha) will be within the Erosion Area. A greater area of Green Space (10.2ha) and Golf Course (12ha) will be within the Erosion Vicinity along with Scottish Water Assets including the clean water network (0.4km) and rising mains (0.15km). Similarly greater lengths of road will be affected by this time.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion but are identified for awareness raising and future planning.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	1	1	0	0	0	0.23	0.36	1.78
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
1	1	0	0	0	0	1.23	0.64	1.08

### Summary of Coastal Erosion Risk in PU 31

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information

## EXISTING COASTAL DEFENCE

There are areas of coastal defence at Kirkcolm, including an area of rock armour protecting the shoreline. A section of promenade protects part of the A718 adjacent to Marian Port while there is wall between Salchrie and Soleburn also protecting the A718. This road provides a vital local transport link between Kirkcolm and Stranraer. There is also a section of coastal defence fringing the north-west corner of Creachmore Golf Course (NX037637) which includes rock armour. Coastal defences located within PU 31 are summarised below.

## APPENDIX D – POLICY STATEMENTS

SUMMARY OF EXISTING COASTAL DEFENCE					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
A718 Marian Port (Strn027)	Council (Roads)	Promenade	3	Monitor the growth on the exposed face and its effect on its stability.	A718
(Strn028)	Council (Roads)	Promenade	4	Monitor the growth on crest and its effect on its stability.	
Wig Bay (Strn029)	Private	Embankment	3	N / A	Shoreline & Agricultural land, footpath & bird colony
A718 Low Salchrie (Salch001)	Council (Roads)	Wall	2	Monitor cracking on exposed face.	A718
Craichmore Golf Course	Private	Revetment	-	-	-
Glensdie Slipway	Private	-	-	-	-

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

### A718 Marian Port (Strn027- Strn028)

This 200m embankment fringes the shoreline at Marian Port and provides protection to the A718. The asset condition survey described this asset as in fair to poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. The continued monitoring of this defence asset is recommended, particularly of vegetation growth along its exposed crest. It is presumed that this coastal defence is Council (Roads) owned.



**Plate 31.1: a. Strn027 (Promenade) & b. Strn028 (Promenade)**

## APPENDIX D – POLICY STATEMENTS

### [Wig Bay \(Strn029\)](#)

This 150m embankment fringes the shoreline at the mouth of the Corsewall Burn and extends generally south along the edge of the agricultural land. The presence of this defence asset benefits the shoreline and adjacent fields. The asset condition survey described this asset as in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. This defence also benefits a footpath and bird colony. The 2002 Coastal Protection Inventory referred to these defences as being privately owned.



**Plate 31.2: Strn29 (Embankment)**

### [A718 Low Salchrie \(Salch001\)](#)

This 40m wall fringes the shoreline at Low Salchrie and provides protection to the A718. A review of site conditions identified the remnants of groynes (dating c.1930s) along the foreshore. The asset condition survey described this asset to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The continued monitoring of this defence asset is recommended, particularly of the cracking along its exposed crest. It is presumed that these coastal defences are Council (Roads) owned. The Coastal Defence asset survey did not provide images of this feature.

**APPENDIX D – POLICY STATEMENTS**

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x	?	?	Hold the Line is progressed, however it may be difficult to justify economically and potential environment and social impacts are identified.
Managed Realignment	✓	✓	✓	?	Managed Realignment is also progressed, some potential social impacts are identified.
No Active Intervention	✓	✓	✓	?	No Active Intervention is progressed, some potential social impacts are identified.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>SMP05 suggested a policy of No Active Intervention with selective Hold the Line across all epochs. Over the long term (&gt;50years) beach nourishment was suggested for areas identified as erosion hotspots.</p> <p>Hold the Line is proposed for the short term, on the basis that a do minimum approach, involving the patch and repair of existing defences, without extending or constructing new defences will be sustainable over this epoch. However a substantial length of the A718 is currently at risk of medium likelihood flooding and it is anticipated that this risk will increase in the future due to climate change induced sea-level rise. Therefore Managed Realignment is proposed over the medium and longer term as a more sustainable management approach. A policy of No Active Intervention should continue to apply to the remainder of the shoreline.</p> <p>Potential Managed Realignment options would be to relocate sections of the A718 inland beyond the threat of future erosion and flooding or to upgrade the B738 to make it the main link between Kirkcolm and Stranraer. These options would be subject to the availability of funding and identification of the precise nature of works required through scheme appraisal. The realignment of the A718 landwards would allow for the shoreline to adjust and have a lesser impact upon shoreline habitats and environment than a Hold the Line policy as it would avoid any need for the extension of shoreline defences which could impact upon natural coastal processes.</p>					

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C*	x	x
Managed Realignment	x	C*	C*
No Active Intervention	C	C	C

x – Reject  
 C – Consider  
 A – Alternative  
 \*Localised

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 31 is localised Hold the Line in the short term, changing to one of localised Managed Realignment over the medium and longer term. No Active Intervention should continue to apply to the remaining shoreline.

Managed Realignment would require the existing route of the A718 to be moved landwards, therefore allowing this road to remain operational over the medium and longer-term. The short term Hold the Line policy gives time to investigate potential Managed Realignment options further.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

The preferred policy of Hold the Line should be applied to areas of existing coastal defence over the short term (0-20yr), whilst Managed Realignment should be considered over the medium and long term. The preferred policy of No Active Intervention should be applied to the remainder of the coastal extent of PU 31 and across all epochs, as shown in Figure 31.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 31, the Preferred Policy was not changed.

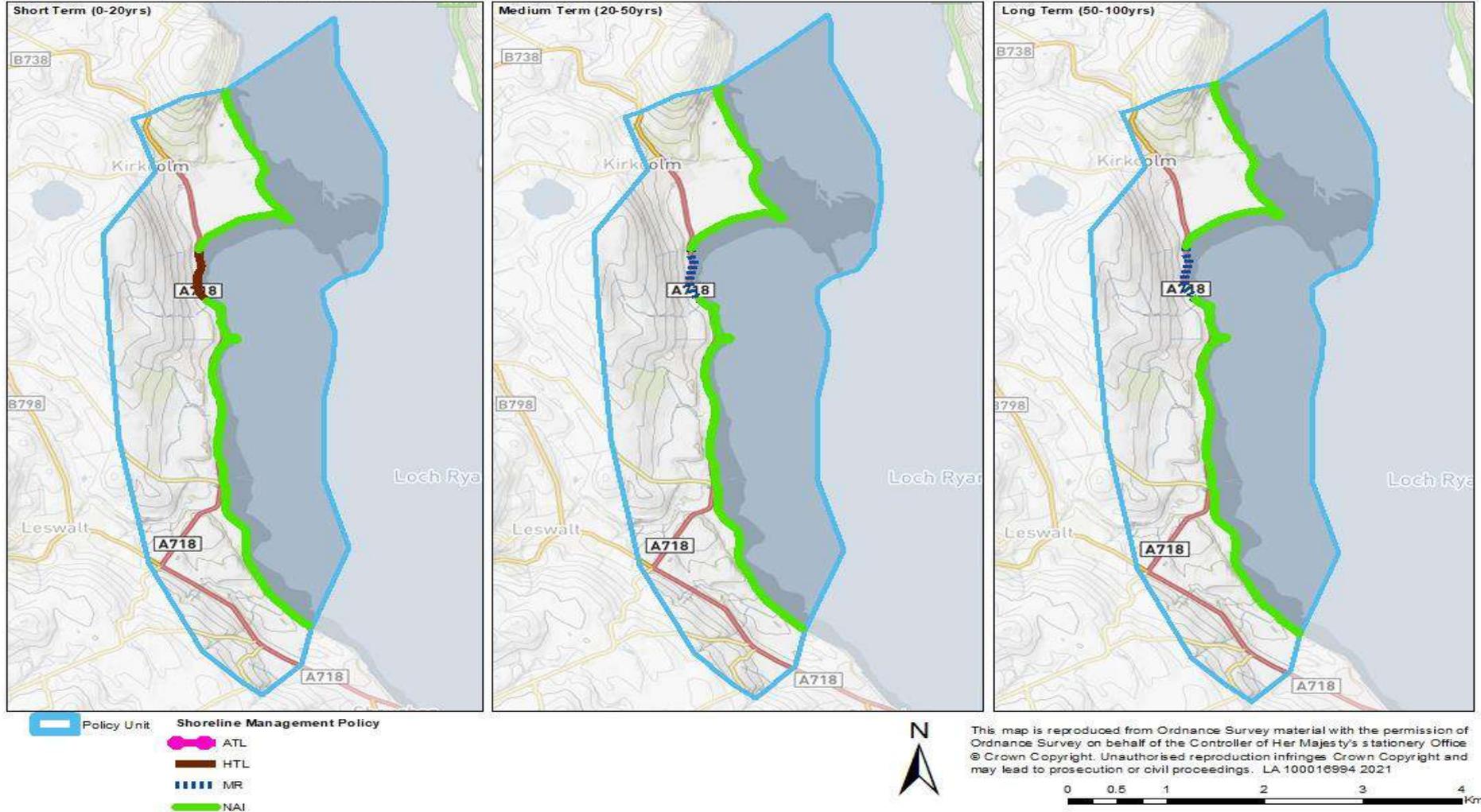
### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention with localised Hold the Line/Managed Realignment at the A718 as presented during the stakeholder engagement was not updated. Figure 31.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 31.

APPENDIX D – POLICY STATEMENTS

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 31.2 Policy Unit 31 Geographical Extent of Preferred Policy (0-100yr) All Epochs



D6.3 PU 32 – McCulloughs Point to Innermessan (Stranraer)

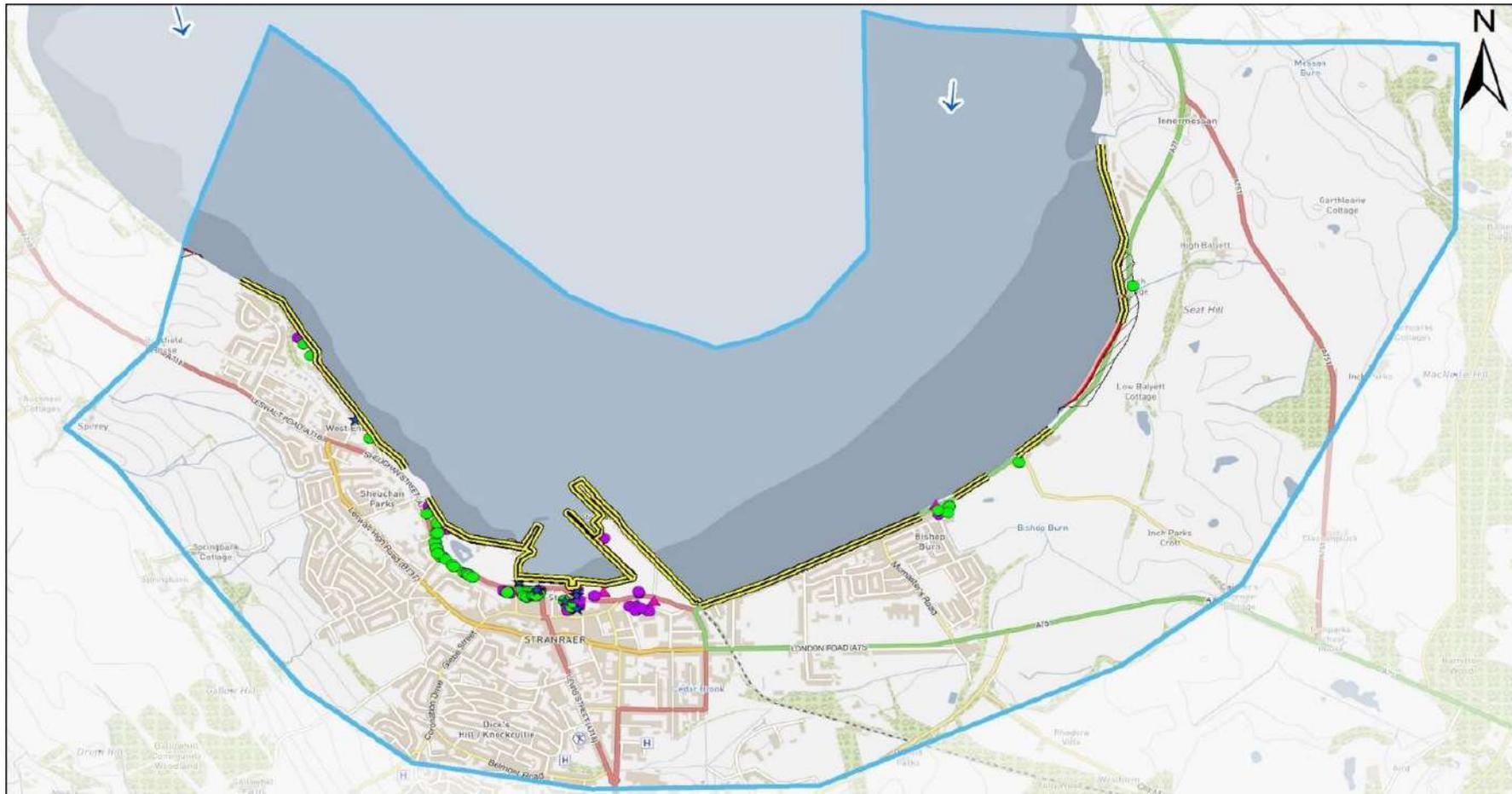


Figure 32.1 Policy Unit 32 Coastal Flood and Erosion Risk

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 32 includes approximately 7km of shoreline around the head of Loch Ryan and is within CPU 6. It extends from McCullochs Point (NX045628) to Innermessan (NX087632). At low tide an area of wide sandy beach is exposed and there is sediment accretion in the areas to the west of the West Pier and to the north of Agnew Park.</p> <p>Stranraer is the main settlement although there are isolated dwellings located to the east of the town. SEPA has identified Stranraer as an Objective Target Area. This means objectives must be considered alongside national principles to manage flood risk. This requires responsible authorities to take a long term, risk-based approach to flood risk management decisions that considers the impacts of measures and their adaptability to climate change. This also requires responsible authorities to deliver coordinated and integrated flood risk management by engaging with communities and working in partnership, sharing data, expertise, services and resources, and to work with natural processes and the environment to deliver multiple outcomes.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data, it is estimated that 78 homes and 38 business premises are currently at risk of medium likelihood coastal flooding. When predicted changes due to climate change are considered, this flood risk is increased to 191 homes and 73 business premises.</p> <p>It is also estimated that 3.8km of road is presently at medium likelihood coastal flood risk, which includes 1.51km of A Class road, including the A718. When predicted changes in sea levels associated with climate change were considered, this increased to 5km, 1.81km of which is A Class road. There is also approximately 0.69km of railway affected by coastal flooding, this is expected to increase to 1.86km in the future.</p> <p>12 hectares of agricultural land is also at risk of medium likelihood coastal flooding. This includes Improved and Rough Grazing. Due to climate change this will increase to 16 hectares. The annual average damage associated with flooding is £410,013.</p> <p>There are three utilities at medium likelihood coastal flood risk, these are Scottish Water facilities. There are no additional utilities affected by climate change.</p> <p>There are three community facilities identified to be at risk within PU 32, these community facilities provide emergency and rescue services. There are no further community facilities affected by climate change.</p> <p>There are nine cultural heritage features at coastal flood risk within PU 32, these are all Listed Buildings (Grade C &amp; B). With climate change it is expected that a further two Listed Buildings (Grade C) will be at flood risk in the future. These properties are mainly located along Harbour Street and Market Street in Stranraer.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	78	191
Business Premises	38	73
Utilities	3	3
Community facilities	3	3
Cultural Heritage	9	11
Transport roads (km)	3.8	5.0
Transport rail (km)	0.69	1.86
Agricultural Land (ha)	12	16
<b>Summary of Coastal Flood Risk in PU 32</b>		

## APPENDIX D – POLICY STATEMENTS

Refer to <https://www.sepa.org.uk/data-visualisation/nfra2018/> regarding flood assessment information.  
\*Climate change is based on UKCP09 projections.

### EROSION RISK

The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries & Galloway coastline than previous estimates had shown.

PU 32 has a heavily modified shoreline, consequently anticipated future coastal change is restricted to a section of undefended shoreline in the east. Dynamic Coast estimates that by the 2030 part of the shoreline of PU 32 will recede landwards by up to 3.5m. The small areas of accretion will become increasingly constrained by 2060 after which this shoreline becomes predominately erosional.

By 2050, one home will be located within the Erosion Vicinity, while 0.15km of road will be within the Erosion Influence and 0.64km within the Erosion Vicinity.

By 2100, one home and one business will be located within the Erosion Vicinity, while it is anticipated that 0.58km of road will be within the Erosional Area, 0.12km within the Erosion Influence and 0.38km in the Erosion Vicinity. The A77 that runs alongside this shoreline will be impacted by coastal erosion.

No other assets have been identified to be at coastal erosion risk.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	1	0	0	0	0	0.15	0.64
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	1	0	0	1	0.58	0.12	0.38

#### Summary of Coastal Erosion Risk in PU 32

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information.

### EXISTING COASTAL DEFENCE

Stranraer is described as an artificial coast that has historically been developed to accommodate harbour infrastructure and other transport facilities. The area is heavily defended with seawalls, revetment and harbour jetties. These defences extend over virtually the entire frontage from McCulloch's Point to Innermessan, Although this shoreline is heavily defended, there is a section adjacent to Agnew Park that is relatively low lying (<4m OD).

**APPENDIX D – POLICY STATEMENTS**

SUMMARY OF EXISTING COASTAL DEFENCE					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Larg Road, Broadstone Road to Sheuchan Street Carpark (Strn026)	Private	Wall	4	Monitor and repair as required.	Residential Area
(Strn025)		Promenade	4		Residential Area Minor Road
(Strn024)		Promenade	3		Residential Area Minor Road
(Strn023)		Wall	4		
(Strn022)		Wall	4		Greenspace and Carpark
Foreland Place to Loch Ryan Sailing Club (Strn021)	Council & Community Council	Wall	3	Monitor and repair as required.	Residential properties and recreational / Greenspace (Agnew Park)
(Strn020)		Wall	2	-	Residential properties and recreational / Greenspace (Agnew Park)
(Strn019)		Promenade	4	Monitor condition	Residential properties and recreational / Greenspace (Agnew Park)
Stranraer Harbour and Marina (Strn018)		Promenade	3	Monitor and repair as required.	Stranraer Harbour and Marina
(Strn017)		Wall	5	Monitor and repair as required.	Stranraer Harbour and Marina A77 and properties
(Strn016)		Wall	3	Agree access in future.	
A77 Cairnryan Road (Strn015)	Transport Scotland	Wall	5	Monitor and repair as required.	Stranraer Harbour and Marina A77 and properties
(Strn014)		Wall	5		A77, properties and adjacent agricultural land
Cairnryan Road (Bishops Burn) (Strn013)		Wall	4	Monitor and repair as required.	
Sandmill Farm (STR013b)		Wall	4	Monitor and repair as required.	A77 & Residential property
A77 (Beach Cottage South) (Strn012)		Wall	3	Continued monitoring.	A77 and adjacent agricultural land
A77 (Beach Cottage North) (Strn011)		Promenade	5	Monitor and rebuild as required.	A77
(Strn010)		Wall	4	Monitor and repair as required.	A77
Ryan Bay Holiday Park (Strn009)	Private	Promenade	2		Private Recreational grounds
*Refer to Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P' for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.					

## APPENDIX D – POLICY STATEMENTS

### Broadstone Road (North) to Sheuchan Street Carpark (Strn026- Strn022)

This is a series of continuous coastal defence assets that fringe the western shoreline of Loch Ryan. The defence assets include a series of walls and promenades that stretch along the foreshore for over 1km. These defences are in poor condition with the exception of the promenade (Strn0024) that fronts Broadstone Road, which is described to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences. The continued monitoring of this group of coastal defence assets is recommended. The 2002 Coast Protection Inventory noted that these defences are privately owned.



Plate 32.1: a. Strn026 (Wall) & b. Strn025 (Promenade)

## APPENDIX D – POLICY STATEMENTS



Plate 32.2: a. Strn023 (Wall) & b. Strn024 (Promenade)

### Foreland Place to Loch Ryan Sailing Club (Strn021- Strn019)

This group of defence assets form the shoreline to the north of Foreland Place and in the vicinity of the Loch Ryan Sailing Club towards the jetty and marina and include a series of walls and a promenade that fringe the shoreline for 0.5km. These defences are noted to be in good to poor condition. The coastal wall (Strn020) that is located seawards of Stranraer Lifeboat Station (NX055612) is in good condition. The wall that fringes Foreland Place (Strn021) is in fair condition, whilst the promenade (Strn019) located along Agnew Park and at the Sailing Club is described to be in poor condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences. The continued monitoring of assets (Strn021 & Strn019) is recommended. The 2002 Coast Protection Inventory noted that these defences are Council and Community Resources.

## APPENDIX D – POLICY STATEMENTS



Plate 32.3: Strn021 (Wall) & Strn019 (Promenade)

### Stranraer Harbour and Marina (Strn018 – Strn016)

This group of coastal defence assets represents Stranraer Harbour and Marina, located between the West and East Piers. The defence assets include a series of walls and a promenade that fringe the harbour and marina for 0.8km. These defences are noted to be in fair condition, with the exception of the wall (Strn017) which is in very poor condition. There is corrosion of this feature above the waterline and the piling is in poor condition. This wall is situated towards the eastern landward corner of the harbour adjacent to Port Rodie carpark. The promenade (Strn018) is in fair condition, with some loss of material and minor cracking along the exposed face. The wall (Strn016) is comprised of rock revetment, which is described to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences. The continued monitoring of these assets is recommended. The 2002 Coast Protection Inventory noted that these defences are a Council and Community Resources.



Plate 32.4: a. Strn017 (Wall) & b. Strn018 (Promenade)

1. A77 Cairnryan Road (Strn015 – Strn014)

This stretch of wall fringes the Stranraer frontage for over 1km and is located along the seaward edge of the Cairnryan Road (A77). These defences are noted to be in very poor condition, with loss of material along the exposed face and crest. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of these coastal defences. The continued monitoring of these assets is recommended. The 2002 Coast Protection Inventory noted that these defences are owned by Transport Scotland.



Plate 32.5: a. Strn014 (Wall) & b. Strn015 (Wall)

## APPENDIX D – POLICY STATEMENTS

### Cairnryan Road (Bishops Burn) (Strn013)

This stretch of wall fringes the Stranraer shoreline for approximately 0.2km and is located along the seaward edge of the Cairnryan Road (A77) to the east of the Bishops Burn outlet. This wall is noted to be in very poor condition, with a loss of material along the crest and cracks on the exposed face. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The continued monitoring and repair of this asset is recommended. The 2002 Coast Protection Inventory noted that these defences are owned by Transport Scotland.



Plate 32.6: Strn013 (Wall)

### Sandmill Farm (Strn013b)

This stretch of wall fringes the shoreline at Sandmill Farm for approximately 0.2km and is located along the seaward edge of the Cairnryan Road (A77) to the west of the Bishops Burn outlet. This wall is noted to be in poor condition, with large cracks and holes in the exposed and landward faces. The presence of an access gap in this wall renders it ineffective as a flood defence. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The continued monitoring and repair of this asset is recommended. The 2002 Coast Protection Inventory noted that these defences are owned by Transport Scotland.



Plate 32.7: Strn013b (Wall)

## APPENDIX D – POLICY STATEMENTS

### A77 Beach Cottage South (Strn012)

This stretch of wall fringes the shoreline for approximately 0.12km close to Sandmill Farm, it is located along the seaward edge of the Cairnryan Road (A77). This wall is noted to be in fair condition and is generally overgrown. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The continued monitoring of this asset is recommended. The 2002 Coast Protection Inventory noted that this defence is owned by Transport Scotland.



Plate 32.8: Strn012 (Wall)

### A77 Beach Cottage North (Strn010- Strn011)

This promenade and wall fringes the shore seawards of the A77 for 0.27km, to the north of Beach Cottage and the outlet of an unnamed watercourse. The promenade (Strn011) is noted to be in very poor condition and is generally failing. The wall (Strn010) is noted to be in poor condition, with large cracks and loss of material in places. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The monitoring and rebuilding of this coastal defence asset is recommended. The 2002 Coast Protection Inventory noted that these defences are owned by Transport Scotland.



Plate 32.9: Strn011 (Promenade) & Strn012 (Wall)

## APPENDIX D – POLICY STATEMENTS

### Ryan Bay Holiday Park (Strn009)

This promenade fringes the frontage of Ryan Bay Holiday Park for about 0.5km. This promenade is noted to be in good condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The monitoring and repair of this coastal defence asset is recommended. It is presumed that these coastal defence assets are privately owned.



Plate 32.9: Strn009 (Promenade)

### REVIEW OF MANAGEMENT POLICIES

Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	?	?	✓	Progress Hold the Line, potential economic, Environmental & Heritage impacts are identified.
Managed Realignment	✓	✓	?	!	Progress Managed Realignment, potential, Environmental & Heritage and significant social impacts are identified.
No Active Intervention	x				No Active Intervention is not presently appropriate for this Policy unit due to the large number of properties at risk.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					

### JUSTIFICATION FOR RETENTION / REJECTION

SMP05 recommended a policy of Hold the Line across all epochs, combined with beach nourishment over the long term (>50years).

Given the assets at risk within the town of Stranraer, including commercial and residential properties the present shoreline management policy of Hold the Line should be continued for as long as it is practical to

## APPENDIX D – POLICY STATEMENTS

do so. This strategic option should be considered in line with existing town regeneration plans that aim to develop the shore front of Stranraer and invigorate the town as well as to re-establish its link with the coast. Detailed investigations that produced a Waterfront Masterplan and Urban Design Strategy for the Stranraer Waterfront have identified a need to include flood remediation works such as raising of low frontage levels and extending hard defences. 2010 investigations recommended coastal flood defence should mitigate against a one in 25 year peak still water and protect against splashing waves (wave overtopping). Other recommendations include flood adaptation / resilience solutions, such as water resistant construction techniques and raised electrical utilities. It is noted that current guidance and best practice suggest that a scheme should be designed to provide a 200 year standard of protection, although other standards can be considered subject to economic appraisal. The Standard of Protection is a robust estimate of the return period to which a scheme protects.

The continuation of a Hold the Line policy will require continued maintenance and potentially improvement of existing defences as outflanking and overtopping may become more significant issues in the future. The failure of an individual defence asset could have consequences for adjacent coastal defences that benefit the A77.

Managed Realignment was also considered as part of the Waterfront Masterplan, involving the relocation of the railway. If Managed Realignment is progressed, opportunities to re-route the A77 and relocate individual properties should also be investigated. Implementation of this policy has potential for social impacts arising from the loss of properties. Consultation with Historic Environment Scotland is required due to the potential impact on heritage and landscape features.

### SELECTION OF POLICY

Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	C	C	C
Managed Realignment	x	A	A
No Active Intervention	x	x	x

x – Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 32 is to Hold the Line over all epochs. This policy is in line with the recommendations of the existing Stranraer Master Plan. There may be opportunities for Managed Realignment to be progressed in parallel with the main Hold the Line policy over the medium to longer term. Existing proposals contained in the Stranraer Masterplan suggest moving the railway station towards the southern end of the East Pier which would offer enhanced protection. Other opportunities may include the re-routing of the A77 or utilising the A751 and A75 as an alternative.

While coastal flooding is expected to increase over time as sea levels rise, in the shorter term limited economic and social impact may be avoided through implementation of resistance / resilience measures. This approach is also considered in the Stranraer Master Plan. SEPA strategic flood mapping data indicates that medium likelihood coastal flooding depths average 0.28m with maximum depths of 0.67m. In the future, medium likelihood coastal flooding depths will average 0.53m with maximum depths of 1.15m. For the more extreme coastal flood depths, the applicability of short-term resistance / resilience mitigation measures is limited. If this approach is pursued, properties that are Listed Buildings, are likely to require consent and consultation with Historic Environment Scotland is therefore recommended.

Other opportunities to develop a more resilient future include beach regeneration, within this and adjacent policy units. This may reduce wave run-up and reduce the impact of wave over-topping but will not reduce direct tidal inundation.

## APPENDIX D – POLICY STATEMENTS

The final scheme developed for Stranraer should reflect the concerns and opportunities already identified through consultation with stakeholders and the public. A higher standard of protection than that considered in the Stranraer Masterplan should also be considered, where practical, whilst providing environmental improvements and wider amenity benefits to Stranraer. If practical, a scheme providing a 200 year standard of protection (with the allowance for future sea level rise due to climate change) following current best practice guidelines should be considered.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

The preferred policy of Hold the Line should be applied to the entire coastal extent of PU 32 and across all epochs, as shown in Figure 32.2. Managed Realignment is recommended as an alternative approach over the medium and long term.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for PU 32 the Preferred Policy of Hold the Line has not required updating.

### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of Hold the Line as presented during the stakeholder engagement was not updated.

**GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES**

**Figure 32.2 Policy Unit 32 Geographical Extent of Preferred Policy (0-100yr) All Epochs**



**Policy Unit**

**Shoreline Management Policy**

- ATL
- HTL
- MR
- NAI

0 0.375 0.75 1.5 2.25 3 Km

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D6.4 PU 33 – Innermessan to Bankhead



Figure 33.1 Policy Unit 33 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 33 is a 3.5km long low-lying stretch of shoreline located along the eastern shore of Loch Ryan extending from Innermessan (NX087632) in the south to Bankhead in the north (NX073670) and is within CPU 6. In the past this section of shoreline was heavily used for military and industrial purposes. The shoreline of PU 33 is fringed by a narrow gravel beach. Loch Ryan is a designated shellfish area.</p> <p>A section of the A77 runs along this part of the Dumfries &amp; Galloway coastline, serving the ferry ports at Cairnryan and Old House Point. It is defended by coastal defences described as a promenade which includes a masonry wall with a concrete apron that slopes onto the existing beach.</p> <p>Glen App and Galloway Moors SPA and SSSI are situated within PU 33, inland from the coastline.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data there are no properties currently at a medium likelihood coastal flood risk. This situation was unchanged when the effects of climate change were considered.</p> <p>No roads are currently at risk of flooding, with no additional risk due to climate change.</p> <p>4.6 hectares of agricultural land is at risk of medium likelihood coastal flooding. Most of the land at risk is Improved Grazing. Due to climate change this will increase to six hectares. The annual average damage associated with coastal flooding is £8,960.</p> <p>No utilities, community facilities or cultural heritage features were identified to be at a medium likelihood coastal flood risk, nor is there is additional risk due to climate change.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	0	0
Utilities	0	0
Community facilities	0	0
Cultural Heritage	0	0
Transport roads (km)	0	0
Transport rail (km)	0	0
Agricultural Land (ha)	4.6	6
Summary of Coastal Flood Risk in PU 33		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown.</p> <p>PU 33 is a generally soft shoreline, and Dynamic Coast estimates that by 2030 parts of the shoreline will recede landwards by up to 53m. By 2050 Dynamic Coast estimates that 0.09km of road will be within the Erosional Area, 0.06km within the Erosion Influence and 1.3km within the Erosion Vicinity. Scottish Water assets including the clean water network (0.49km) will also be located within the Erosion Vicinity.</p>		

## APPENDIX D – POLICY STATEMENTS

By 2100, the extent of roads affected increases to 0.49km of road within the Erosional Area, 0.15km within the Erosion Influence and 0.96km within the Erosion Vicinity. Sections of the A77 located alongside this shoreline will be impacted by coastal erosion by this time. Additionally, it is anticipated that 0.42km of the clean water network within the Erosional Area, 0.1km within the Erosion Influence and 0.62km within the Erosion Vicinity, while one business will be located within the Erosion Vicinity.

Assets located within the Erosional Area and Erosion Influence are expected to be 'affected' by erosion. Those assets located within the Erosion Vicinity are not expected to be significantly impacted by erosion, but are identified for awareness raising and future planning.

It is also estimated that small sections of Core Path, including the Loch Ryan Coastal path (50m) and Rotary Club Path (150m) at erosion risk.

Homes			Businesses			Roads (all) (km)		
<b>2050</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	0	0.09	0.06	1.3
<b>2100</b>								
Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity	Erosional Area	Erosion Influence	Erosion Vicinity
0	0	0	0	0	1	0.49	0.15	0.96

### Summary of Coastal Erosion Risk in PU 33

This summary highlights the assets at risk under a 'do nothing' High Emission Scenario and a 'do nothing' coastal management scenario. This assumes that artificial and natural defences are not maintained and where present erosion can affect landward assets. Erosional Area is the eroded land seaward of the 2050 & 2100 MHWS position. Erosion Influence (EI) is a 10m buffer landward of the anticipated position of MHWS in 2050. Assets within both EA and EI are expected to be 'affected' by erosion. Erosion Vicinity (EV) considers the adjacent assets a further 50m from the EI. These assets are not expected to be affected by erosion and are identified for awareness raising and future planning.

Refer to <http://dynamiccoast.com/> for further details relating to the Dynamic Coast erosion information

### EXISTING COASTAL DEFENCE

There are some coastal defence structures that protect the coastal road (A77). These are currently in a variable state of repair. Coastal defences located within PU 33 are summarised below.

### SUMMARY OF EXISTING COASTAL DEFENCE

Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
A77 Cairnryan (Strn007)	Transport Scotland	Promenade	3	Monitor condition	A77
(Strn008)		Promenade	5	Monitor and repair as required.	

\*Refer to [Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'](#) for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.

## APPENDIX D – POLICY STATEMENTS

### 1. [A77 Cairnryan \(Strn007 & Strn008\)](#)

This promenade fringes the shore seawards of the A77 for 0.77km and is located adjacent to a grass verge. The promenade (Strn008) is noted to be in very poor condition with a loss of material thickness at the exposed face and along its base. The presence of this feature benefits the A77. The promenade (Strn007) also fringes the shore seawards of the A77 for 0.1km and is located north of Strn008. This promenade (Strn007) is noted to be in fair condition. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. The monitoring and repair of these coastal defence assets is recommended. The 2002 Coastal Protection Inventory referred to these defences as being owned by Transport Scotland.

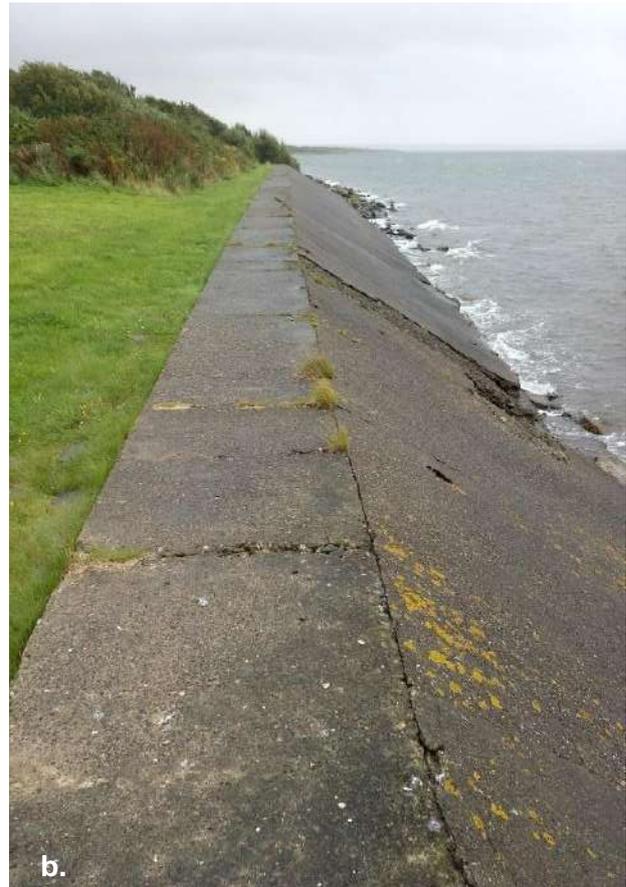


Plate 33.1 a. Strn007 (Promenade) & b. Strn008 (Promenade)

## APPENDIX D – POLICY STATEMENTS

REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	✓	x	?	?	Progress Hold the Line, this may be economically challenging and Environmental & Heritage and social impacts are identified.
Managed Realignment	✓	✓	✓	?	Progress Managed Realignment, potential economic challenges identified, social impacts are identified.
No Active Intervention	x				No Active Intervention would lead to increased disruption to the A77 which is a vital link to the Ferry ports.
x - Reject ✓ - Progress ? - Progress, however potential for impacts identified ! - Progress, however potential for significant impacts identified					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>SMP05 recommended a policy of No Active Intervention for the most part of this coastline, with selective Hold the Line for areas of coastal defence.</p> <p>The A77 benefits from the presence of coastal defences, however there are no other assets identified to be at flood or erosion risk within PU 33. Over the short term Hold the Line should continue involving the reactive patch and repair of existing defences as there is currently no requirement to improve or extend these.</p> <p>A potential Managed Realignment option in the medium to long term would involve relocation of a section of the A77 inland, beyond the threat of future erosion and potential flooding.</p> <p>Any works would be subject to the availability of funding and the precise nature of works would need to be established at scheme appraisal stage. The realignment of the A77 landwards would allow for the shoreline to adjust naturally and hence have a lesser impact upon shoreline habitats and environment.</p>					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	x	x	x		
Hold the Line	C	x	x		
Managed Realignment	x	C	C		
No Active Intervention	x	x	x		
x – Reject C – Consider A – Alternative					

## APPENDIX D – POLICY STATEMENTS

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 33 is to Hold the Line in the short term, changing to Managed Realignment over the medium and longer term. Managed Realignment would involve moving the existing route of the A77 landwards, therefore allowing for this road to remain operational over the medium and longer term.

The continued maintenance of existing defences located to the north of this policy unit will provide time to investigate this potential option further at these locations.

Implementation of these recommended policies is subject to funding and resource availability and will require detailed scheme level appraisal and appropriate consent and permissions to be obtained.

The preferred policy of Hold the Line should be applied to the entire coastal extent of PU 33 and over the short-term. Over the medium and long term Managed Realignment should be applied as shown in Figure 33.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

The Dynamic Coast second phase data has been considered as part of this SMP and while it is now anticipated that due to future sea level rise, more extensive future erosion is expected within PU 33, it was not necessary to update, the Preferred Policy.

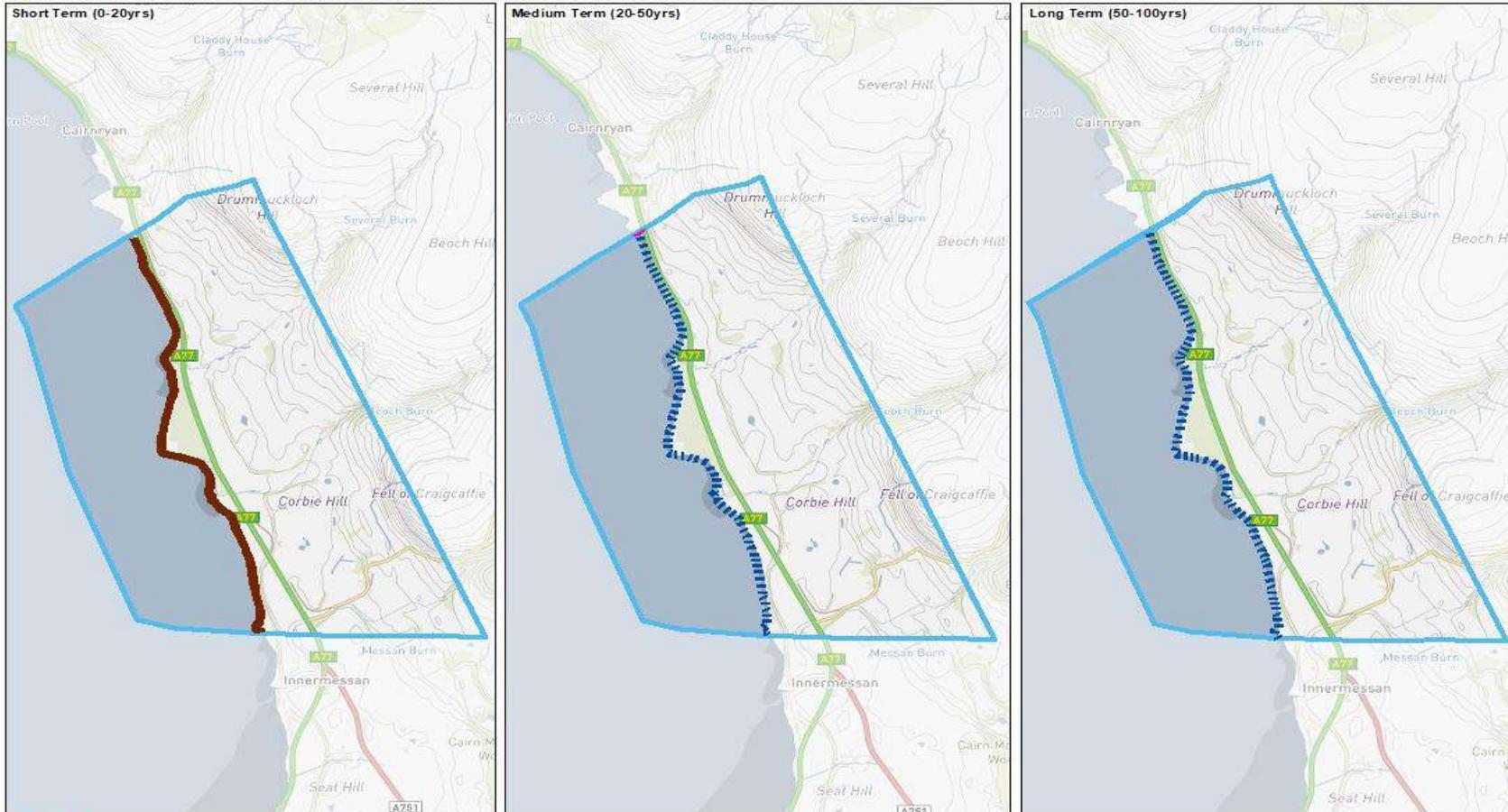
### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of Hold the Line over the short term leading to a policy of Managed Realignment as presented during the stakeholder engagement was not updated.

APPENDIX D – POLICY STATEMENTS

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 33.2 Policy Unit 33 Geographical Extent of Preferred Policy (0-100yr) All Epochs



- Policy Unit
- ATL
- HTL
- MR
- NAI



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D6.5 PU 34 – Bankhead to Old House Point

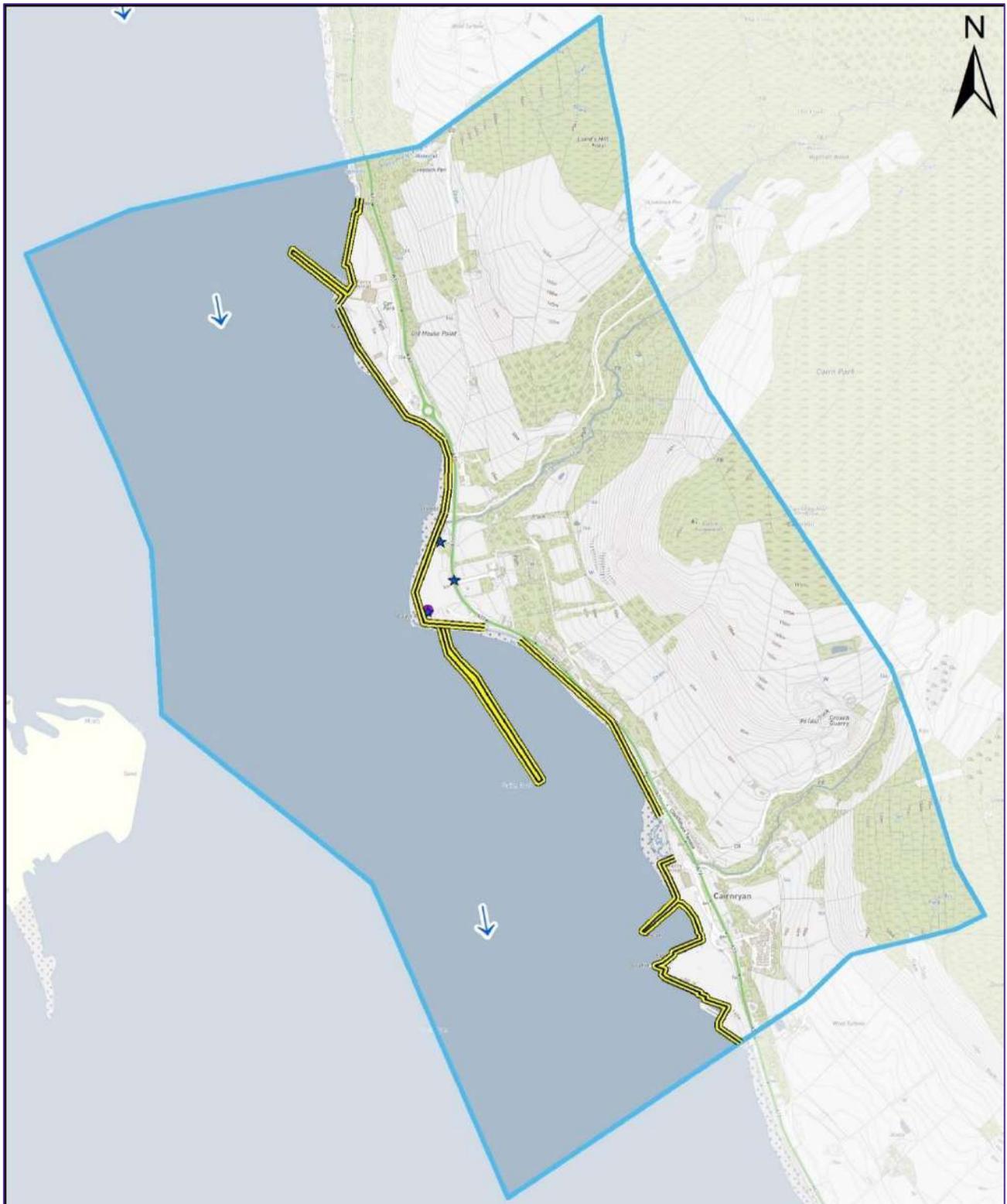
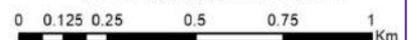


Figure 34.1 Policy Unit 34 Coastal Flood and Erosion Risk

- |                          |   |                                      |
|--------------------------|---|--------------------------------------|
| Policy Unit              | <b>200yr Coastal Flood Risk Receptors</b> | <b>Future Coastal Erosion (2050)</b> |
| Cultural Heritage        | Residential Properties                    | Erosion                              |
| Defence Asset            | Non-Residential Properties                | Erosion Influence                    |
| Sediment Drift Direction | Utilities                                 | Erosion Vicinity                     |

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT		
<p>PU 34 extends from Bankhead (NX073670) to Old House Point (NX059703). It includes the village of Cairnryan and the Cairnryan and Old House Point (Loch Ryan Port) ferry ports. It is within CPU 6.</p> <p>This Policy unit is commercially very important as the two ferry ports provide a vital trade link between Northern Ireland and Great Britain and thus is essential to the integrity of the UK.</p> <p>PU 34 has a history of military usage and was formerly the location of a ship breaking yard (Cairn Point) and hence has potential to contain polluting materials from WW2 and later activities.</p> <p>Glen App and Galloway Moors SPA and SSSI is situated within PU 34, inland from the coastline.</p>		
FLOOD RISK		
<p>Based on SEPA strategic flood mapping data there are two business premises presently at risk of medium likelihood coastal flooding. When climate change is considered, there is no increase in the number of assets at medium likelihood coastal flood risk.</p> <p>In addition, 0.1km of minor road is affected by coastal flooding. When the anticipated impacts of climate change are considered, 0.19km of road will be at coastal flood risk.</p> <p>1.4 hectares of agricultural land is also at risk of medium likelihood coastal flooding. An area of Rough Grazing is affected. Due to climate change this will increase to 2.2 hectares. The annual average damage associated with flooding in PU 34 is £15,746.</p> <p>There are three cultural heritage assets identified to be at flood risk, increasing to four in the future as a consequence of climate change. This includes the coastal edge of Lochryan Garden and Designed Landscape.</p>		
Receptor	Medium likelihood	*Medium likelihood with climate change
Homes	0	0
Business Premises	2	2
Utilities	0	0
Community facilities	0	0
Cultural Heritage	3	4
Transport roads (km)	0.1	0.19
Transport rail (km)	0	0
Agricultural Land (ha)	1.4	2.2
<p><b>Summary of Coastal Flood Risk in PU 34</b></p>		
<p>Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information. *Climate change is based on UKCP09 projections.</p>		
EROSION RISK		
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown. However, the analysis did not indicate any coastal erosion associated with PU 34. There is concern however regarding the potential for any erosion to release contaminants originating from former military and ship breaking activities associated with PU 34 into the marine environment.</p>		

## APPENDIX D – POLICY STATEMENTS

EXISTING COASTAL DEFENCE					
There are a series of coastal defence assets protecting the A77, as well as commercial and residential properties. Some of these defence assets show severe cracking and collapse along the exposed face and movement within the rock armour sections. Coastal defences located within PU 34 are summarised below.					
SUMMARY OF EXISTING COASTAL DEFENCES					
Reference	Presumed Owner	Description	*Condition Grade	Recommendation	Benefitting Area
Cairnryan Village (Strn006)	Transport Scotland	Promenade	4	Monitor and repair as required.	A77 & Properties
Cairnryan Lighthouse (Strn005)	Private	Promenade	3	Repair wall to ensure it is fully functional as a flood defence.	A77 & Properties
Cairnryan Carpark (Strn004)	Transport Scotland	Promenade	5	Monitor and repair as required.	A77 & Carpark
Cairnryan Carpark (Strn003)		Promenade	3	Monitor and repair as required.	
Cairnryan Ferry Terminal (Strn002)		Promenade	4	Monitor and repair as required.	A77 approaching Ferry Terminal
Cairnryan Ferry Terminal (Strn001)	Private	Promenade	2	Monitor and repair as required.	Ferry Terminal Infrastructure
Old Cairnryan Pier		Promenade	-	-	-
Old House Point		Pier	-	-	-
Bankhead 1	Transport Scotland	Wall	-	-	-
Bankhead 2		Wall	-	-	-
*Refer to <a href="#">Chapter 1 of the Environment Agency Manual 'SCO0509BQAT-E-P'</a> for an explanation of condition grades used. Grades used range from 1 to 5. Grade 1 is Very good, Grade 2 is Good, Grade 3 is Fair, Grade 4 Poor and Grade 5 is Very poor.					
<p><b><a href="#">Cairnryan Village (Strn006)</a></b></p> <p>This promenade fringes the shore seawards of the A77 for about 0.8km, to the south of the Cairnryan Ferry Terminal, adjacent to a grass verge. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. This feature is noted to be in a poor condition with the total loss of rock armour at multiple locations and the exposed face eroding in several locations. The monitoring and repair of these coastal defence assets is recommended. The 2002 Coastal Protection Inventory referred to these defences as owned by Transport Scotland.</p>					



Plate 34.1: Strn006 (Promenade)

**Cairnryan Lighthouse (Strn005)**

This promenade fringes the shore for about 0.6km, along the site of Cairnryan Lighthouse and the former breakers yard (NX061686). The promenade (Strn005) is noted to be in fair condition. The presence of this feature benefits the derelict industrial site located landwards. There are Cultural and Heritage features located here, including the lighthouse.

Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The continued repair of these coastal defence assets is recommended to ensure that they remain fully functional as a coastal defence to prevent any loss of potentially contaminated material. The Dynamic Coast first phase identified this area to be at erosion risk, with projected erosion by 2050 of 26m of inland movement and the erosion vicinity extending 90m inland, however the newer Dynamic Coast second phase assessment does not indicate such an erosion risk due to the inclusion of defences within the analysis.

Consequently there is concern given the military and industrial history of this site that the promontory may contain polluting materials associated with its former use. It is presumed that these are private coastal defences.



Plate 34.2: Strn005 (Promenade)

**Cairnryan Carpark (Strn004 & Strn003)**

This promenade fringes the shore seawards of Cairnryan carpark for about 0.2km, and is located north of Cairn Point. The promenade (Strn003) is noted to be in fair condition with some vegetation growth on its exposed face. The presence of this feature benefits the carpark. The promenade (Strn004) fringes the shore seawards of the carpark for 0.1km and is located south of Strn003. This promenade (Strn004) is noted to be in very poor condition, with the collapse of material along its exposed face. Based on SEPA flood mapping, the medium likelihood coastal flood extent does not extend landwards of this coastal defence. This defence marks the downstream extent of the Glen Burn. The monitoring and repair of these coastal defence assets is recommended. It is presumed that Transport Scotland manage these coastal defences.



Plate 34.3 a. Strn003 (Promenade) & b. Strn004 (Promenade)

[A77 Cairnryan Ferry Terminal \(Strn002\)](#)

The promenade (Strn002) is located to the south of the Stena Ferry Terminal and fringes the shoreline along the A77 for 200m, approaching the Ferry Terminal entrance. This promenade (STRN02) is noted to be in poor condition, with severe cracking along its exposed face. Based on SEPA flood mapping, the medium likelihood coastal flood extent is not located landwards of this coastal defence. The monitoring and repair of these coastal defence assets is recommended. It is presumed that these are managed by Transport Scotland.



Plate 34.4: Strn002 (Promenade)

Cairnryan Ferry Terminal (Strn001)

This promenade (Strn001) fringes the shore seawards of the Stena Ferry Terminal at Old House Point for about 0.6km. The promenade is noted to be in good condition, but is overgrown with dense vegetation, particularly gorse along the upper embankment. The presence of this feature benefits the Ferry Terminal. Based on SEPA flood mapping, the medium likelihood coastal flood extent is located landwards of this coastal defence. The monitoring of this coastal defence asset is recommended. It is presumed that these are private coastal defences.



Plate 34.5: Strn001 (Promenade)

## APPENDIX D – POLICY STATEMENTS

Old Cairnryan Pier					
<p>Cairnryan Pier owes its existence to historical military and former industrial activity associated with this area. The Dynamic Coast second phase assessment has included this pier as part of a coastal defence asset data-set and assumed that its presence may influence coastal change at this location. Although this pier was not included as part of the coastal defence asset survey, it is generally described as being in a poor state and falling into disrepair. It is presumed that this is a private structure.</p>					
REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	✓	✓	?	✓	Advance the Line policy is progressed, potential impacts are identified.
Hold the Line	✓	✓	?	✓	Hold the Line policy is progressed, potential impacts are identified.
Managed Realignment	✗				No significant opportunity to apply Managed Realignment in this policy unit.
No Active Intervention	✗				No Active Intervention is not considered appropriate for this policy unit.
<p>✗ - Reject                      ✓ - Progress                      ? - Progress, however potential for impacts identified                      ! - Progress, however potential for significant impacts identified</p>					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>SMP05 suggested a policy of Advance the Line for the medium (10 to 50 years) and long term (&gt;50years) in light of the new Stena ferry port at Old House Point that was at development stage at that time.</p> <p>Advance the Line and Hold the Line are the existing SMP policies for PU 34 and should be continued in order to allow the ferry ports remain operational and develop. These policies also offer a degree of environmental protection to Loch Ryan by ensuring that any potentially contaminated material associated with the former uses of Cairn Point can be contained.</p> <p>For the majority of this policy unit the maintenance of defences and port structures is likely to be the responsibility of the relevant operators / owners.</p> <p>Any future plans to develop port facilities should be subjected to a full investigation and appraisal with appropriate consents and permissions followed.</p>					
SELECTION OF POLICY					
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)		
Advance the Line	A	A	A		
Hold the Line	C	C	C		
Managed Realignment	✗	✗	✗		
No Active Intervention	✗	✗	✗		
<p>✗ – Reject                      C – Consider                      A – Alternative</p>					

**SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY**

The preferred strategic approach for PU 34 is to continue the Hold the Line or Advance the Line policies as set by the 2005 SMP.

It is expected that the port authorities (Cairnryan (P&O) / Loch Ryan Port (Stena Line)) will continue to inspect and maintain harbour related structures and undertake repairs and remedial works as necessary.

An investigation may be required to identify any potential contaminant risk associated with the industrial and military legacy and hence the need for containment at Cairn Point.

It is important to note that measures to implement the recommended policy will be subject to funding and resource availability and the granting of appropriate consents and permissions.

As a minimum, Hold the Line applies to the shoreline of PU 34, while Advance the Line applies to areas of Ferry Port infrastructure allowing these ferry ports to remain operational and develop, as shown in Figure 34.2.

**POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS**

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

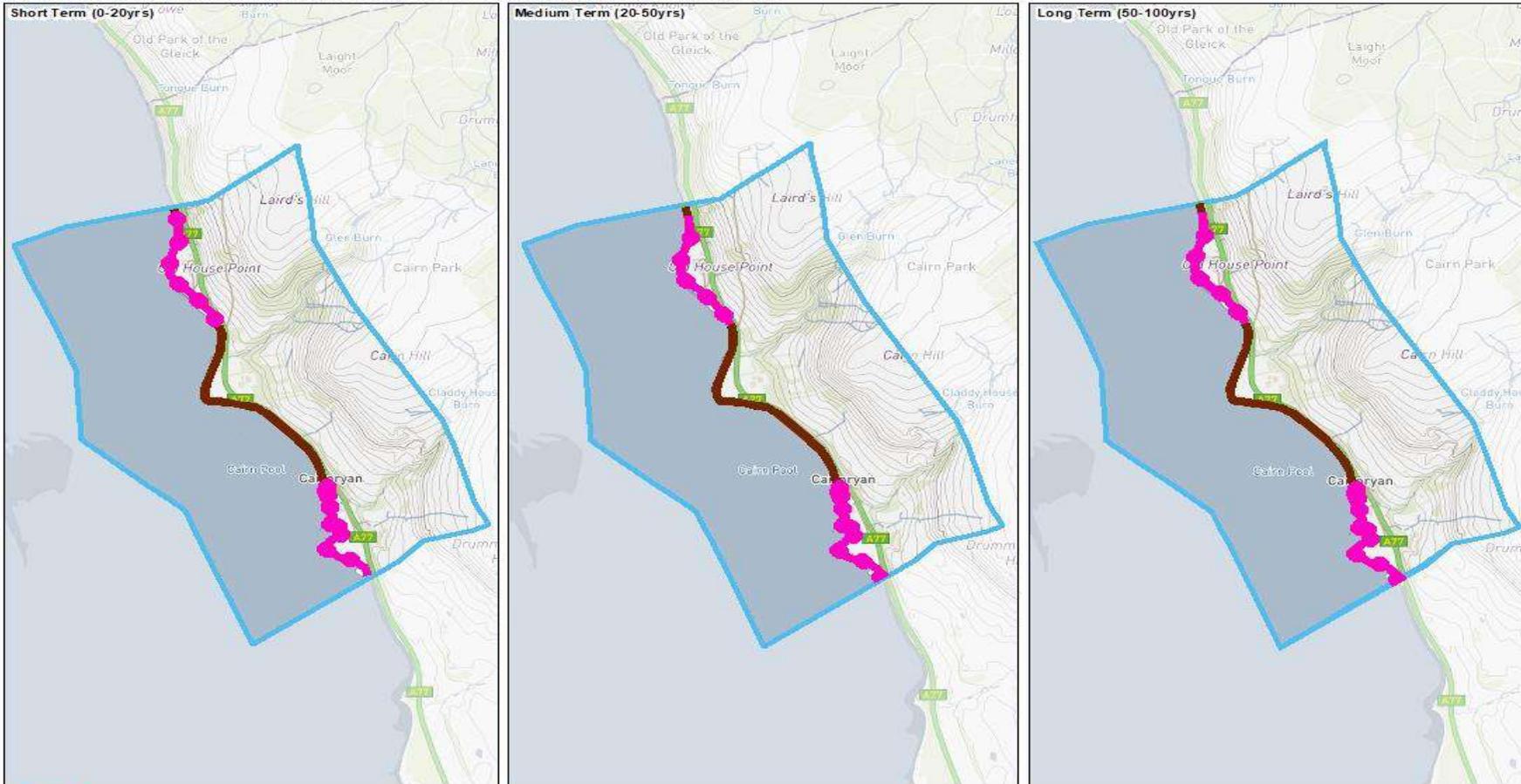
The Dynamic Coast second phase data has now been considered as part of this SMP. While it is now anticipated that due to future sea level rise, more extensive future erosion is expected than previously estimated for the Dumfries & Galloway shoreline, for PU 34, Dynamic Coast 2 no longer indicates any coastal erosion. The previous data-set illustrated future vulnerability associated with erosion of the shoreline at Cairn Point and concern was raised regarding the potential for the release of contaminants that may have originated from its former military usage and ship breaking activities.

**STAKEHOLDER ENGAGEMENT OUTCOME**

Following a review of this information and given the already heavily defenced nature of this section of the coast, the Preferred Policy of Hold the Line/Advance the Line, as presented during the stakeholder engagement was not updated. Figure 34.2 shows the likely spatial extent of each of the shoreline management policy approaches, for PU 34.

GEOGRAPHICAL EXTENT OF PREFERRED SHORELINE MANAGEMENT POLICIES

Figure 34.2 Policy Unit 34 Geographical Extent of Preferred Policy (0-100yr) All Epochs



- Policy Unit
- ATL
- HTL
- MR
- NAI



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D6.6 PU 35 – Old House Point to Galloway Burn

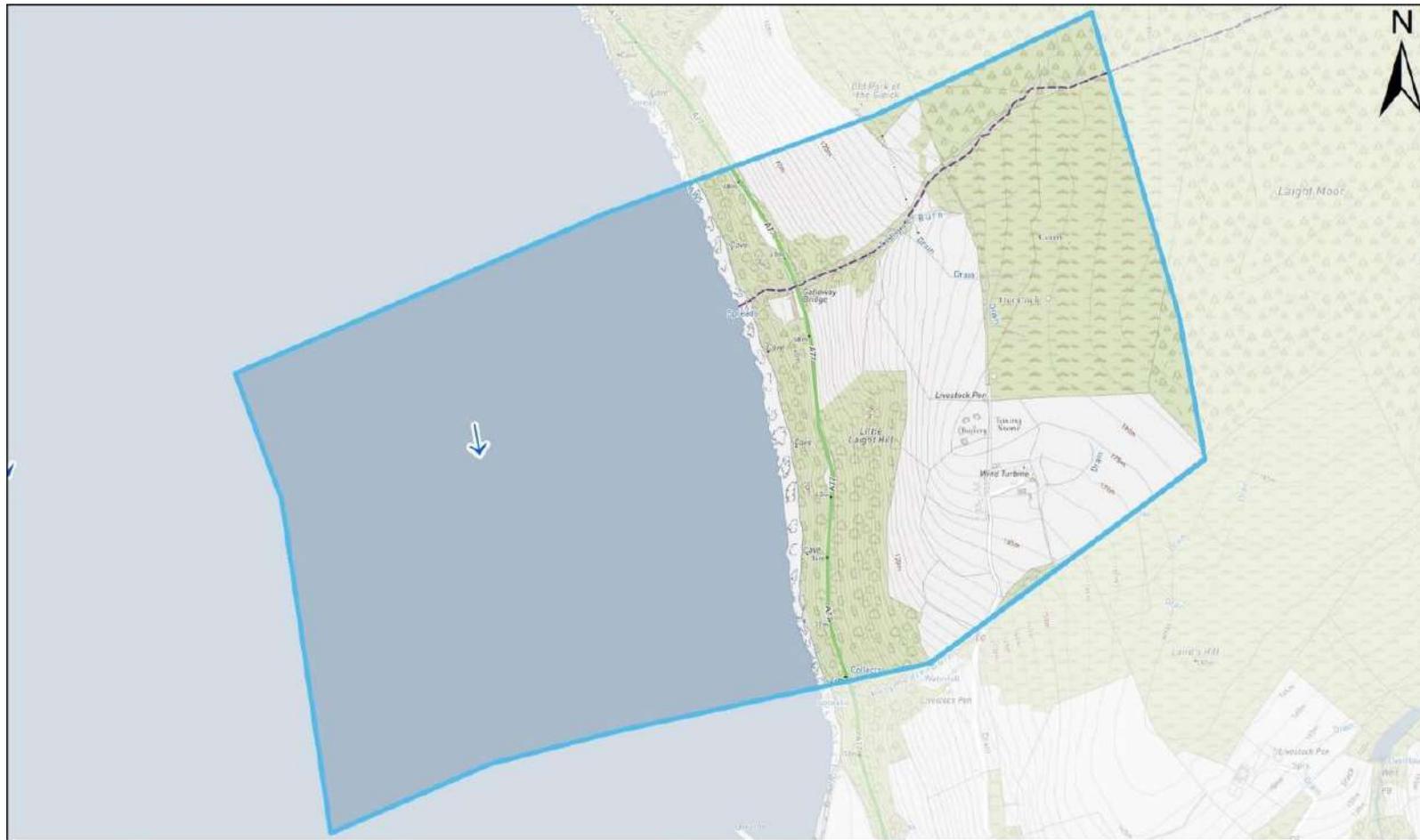
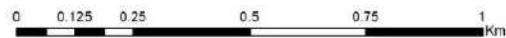


Figure 35.1 Policy Unit 35 Coastal Flood and Erosion Risk

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## APPENDIX D – POLICY STATEMENTS

DESCRIPTION OF POLICY UNIT					
<p>PU 35 is a 2.8km stretch of shoreline within CPU 6 that extends from just north of Loch Ryan Port at Old House Point (NX059703) to the Galloway Burn (NX056715) and the administrative boundary with South Ayrshire. This shoreline is steep and rocky and the small beaches are dominated by gravel and boulders. This section of shoreline is exposed to waves from the open sea.</p> <p>The frontage generally faces towards the west onto Loch Ryan and is undeveloped.</p> <p>The Galloway Burn marks the boundary between the South Ayrshire and Dumfries &amp; Galloway Unitary Authorities. The adjoining SMP for the adjacent section of the South Ayrshire coast (SMP policy unit 6a2) proposes a policy of No Active Intervention across all epochs.</p>					
FLOOD RISK					
<p>Based on the SEPA strategic flood mapping data there are no properties or assets at medium likelihood coastal flood risk either now or in the future based on the UKCP09 climate change projections. Refer to <a href="https://www.sepa.org.uk/data-visualisation/nfra2018/">https://www.sepa.org.uk/data-visualisation/nfra2018/</a> regarding flood assessment information.</p>					
EROSION RISK					
<p>The Dynamic Coast second phase data indicates that as a result of anticipated future sea level rise, more extensive future erosion is expected along the Dumfries &amp; Galloway coastline than previous estimates had shown. However no erosion risk is associated with PU 35.</p>					
EXISTING FORMAL DEFENCE					
<p>There are no coastal erosion or flood defences associated with PU 35.</p>					
REVIEW OF MANAGEMENT POLICIES					
Policy	Screening Criteria				Comment
	Technical	Economic	Environment & Heritage	Social	
Advance the Line	x				No justification for Advance the Line in this policy unit.
Hold the Line	x				No indicated requirement to Hold the Line in this policy unit.
Managed Realignment	x				No opportunity for Managed Realignment in this policy unit.
No Active Intervention	✓	✓	✓	✓	Progress No Active Intervention policy. No potential impacts identified.
<p>x - Reject                      ✓ - Progress                      ? - Progress, however potential for impacts identified                      ! - Progress, however potential for significant impacts identified</p>					
JUSTIFICATION FOR RETENTION / REJECTION					
<p>SMP05 recommended a No Active Intervention approach for this section of shoreline, this should be continued. PU 35 was formerly part of SMP05 PU 36, however the boundary of this unit has been revised to be consistent with the adjacent South Ayrshire SMP Policy unit 6a2, where a No Active Intervention approach has also been recommended. In summary, this stretch of shoreline should be allowed to continue to evolve under natural processes by applying a no active intervention approach.</p>					

## APPENDIX D – POLICY STATEMENTS

SELECTION OF POLICY			
Policy	Short Term (0-20yr)	Medium Term (20-50yr)	Long Term (50-100yr)
Advance the Line	x	x	x
Hold the Line	x	x	x
Managed Realignment	x	x	x
No Active Intervention	C	C	C

x - Reject  
 C – Consider  
 A – Alternative

### SUMMARY OF PREFERRED SHORELINE MANAGEMENT POLICY

The preferred strategic approach for PU 35 across all epochs is to implement a policy of No Active Intervention as there are no assets identified to be at risk as illustrated in Figure 35.2.

### POST PUBLIC ENGAGEMENT SITE SPECIFIC COMMENTS

No feedback or comments on the suggested policy for this policy unit were received from the public and stakeholder engagement, undertaken during March and April 2021.

No Active Intervention is still considered as the most sustainable shoreline management approach for PU 35.

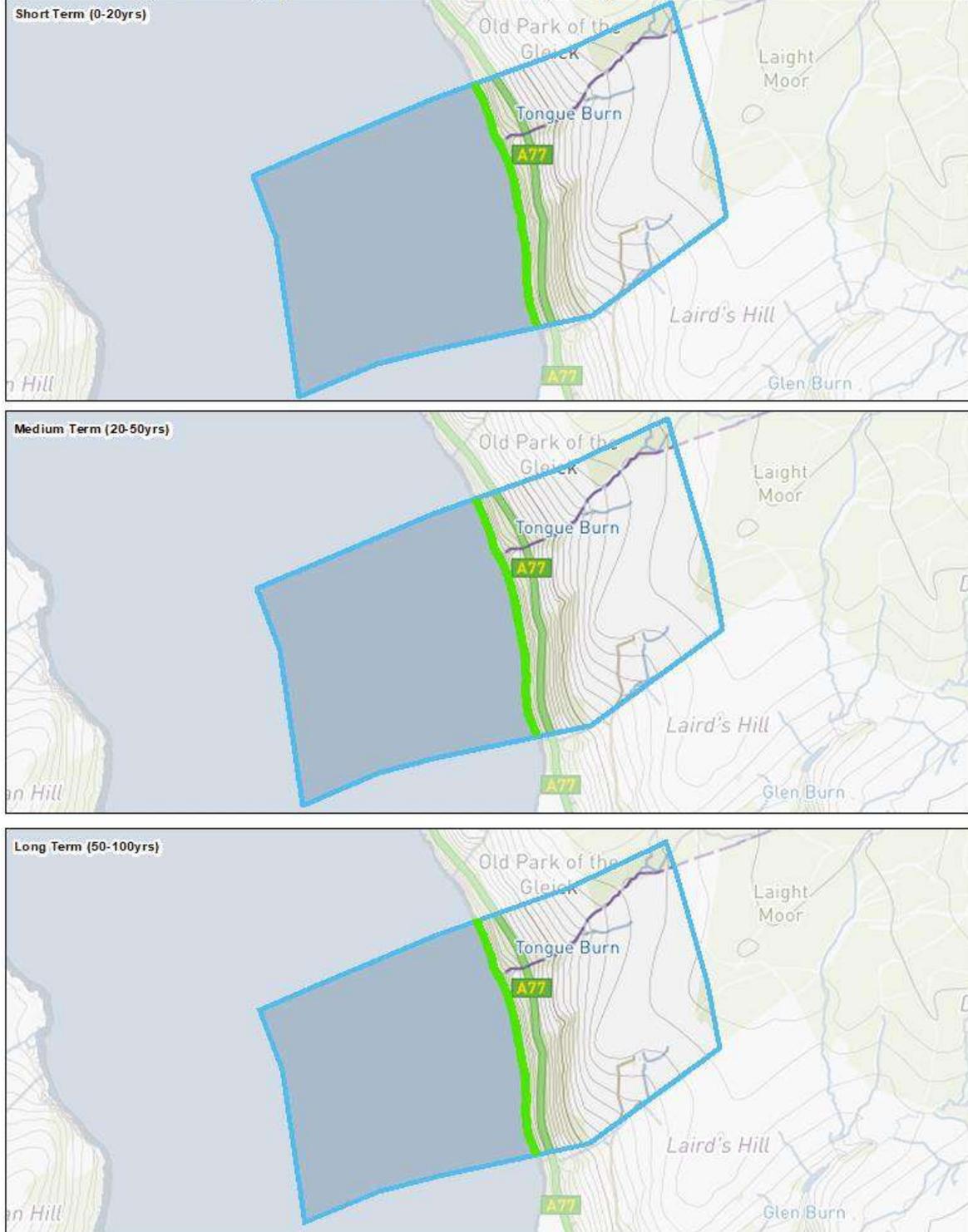
### STAKEHOLDER ENGAGEMENT OUTCOME

The Preferred Policy, of No Active Intervention across all epochs as presented during the stakeholder engagement was not updated.



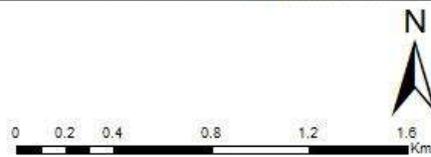
GEOGRAPHICAL EXTENT OF SHORELINE MANAGEMENT POLICIES

Figure 35.2 Policy Unit 35 Geographical Extent of Preferred Policy (0-100yr) All Epochs



**Shoreline Management Policy**

- Policy Unit
- ATL
- HTL
- MR
- NAI



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