

Cumbria Coastal Strategy

main document

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Cumbria Coastal Strategy – Main Document

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Appendices

Appendix A - Policy Area Appraisal Reports (provided as 24 separate reports)

Appendix B - Strategy Action Plan (provided as separate document)

1 Introduction

Cumbria County Council has worked with the Cumbria Coast Protection Authorities, the Environment Agency and other organisations to develop this strategy for the future management of the coast from Arnside to the Scottish Border.

The requirement for a more detailed strategy to cover the smaller interacting policy areas of the Cumbrian coast is identified in the current North West England and North Wales Shoreline Management Plan, which was completed in 2010 (Halcrow, 2011). The Shoreline Management Plan (SMP) provides a large-scale assessment of the risks associated with erosion and flooding along the region's coast between Great Orme's Head in North Wales and the Scottish Border.

The Cumbria Coastal Strategy represents the second tier in the shoreline management process (see Figure 1) and the aim of the strategy is to set out appropriate measures to implement the Shoreline Management Plan. Having a detailed coastal strategy to assess coastal flood and erosion risk allows infrastructure providers and the coast protection authorities to comprehensively quantify the risks and associated damages of coastal flooding and erosion and plan long-term future investment.

The Cumbria Coastal Strategy covers the entire Cumbrian coast, extending some 420 km, and considers not only coastal defences managed by the maritime local authorities and the Environment Agency, but also defences managed by Cumbria County Council, Network Rail and Highways England.

The key objectives of the Cumbria Coastal Strategy are to:

- evaluate the risk of coastal flooding and erosion along the Cumbrian coastline,
- identify properties and infrastructure at risk,
- identify and evaluate potential long-term solutions,
- form a robust and objective evidence base, and
- provide a framework for future infrastructure and development.

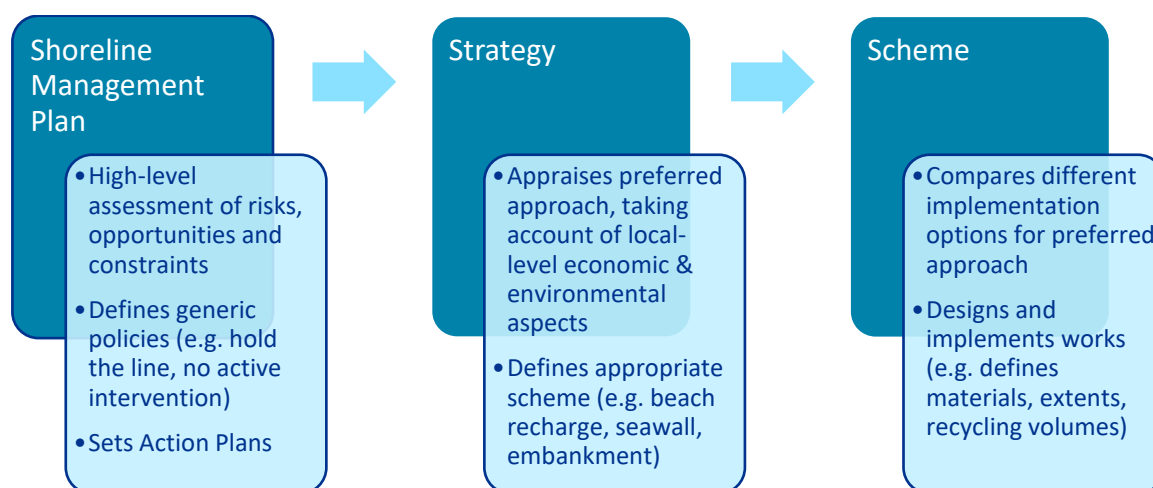


Figure 1 Shoreline management planning hierarchy

This Strategy sets out details of proposals for works and other management activities required over the next 5 to 10 years (approximately to the end of epoch 1 of the SMP) and longer term actions that are largely consistent with the medium and long term shoreline management plan. There are however a

number of locations where changes since the SMP was developed mean that policies may require review: these locations have been highlighted within this document.

The Strategy has adopted the same coastal divisions as the SMP, which defined a three tier system of sub-cells, policy areas and policy units. This Strategy covers 3 of the 5 sub-cells included in the Shoreline Management Plan (see Figure 2):

- Sub-cell 11c (part) Arnside to Hodbarrow Point (Millom) (including the Kent, Leven and Duddon estuaries);
- Sub-cell 11d Hodbarrow Point to St Bees Head (including Ravenglass Estuary complex); and
- Sub-cell 11e St Bees Head to Scottish Border (including Moricambe Bay and the Eden).

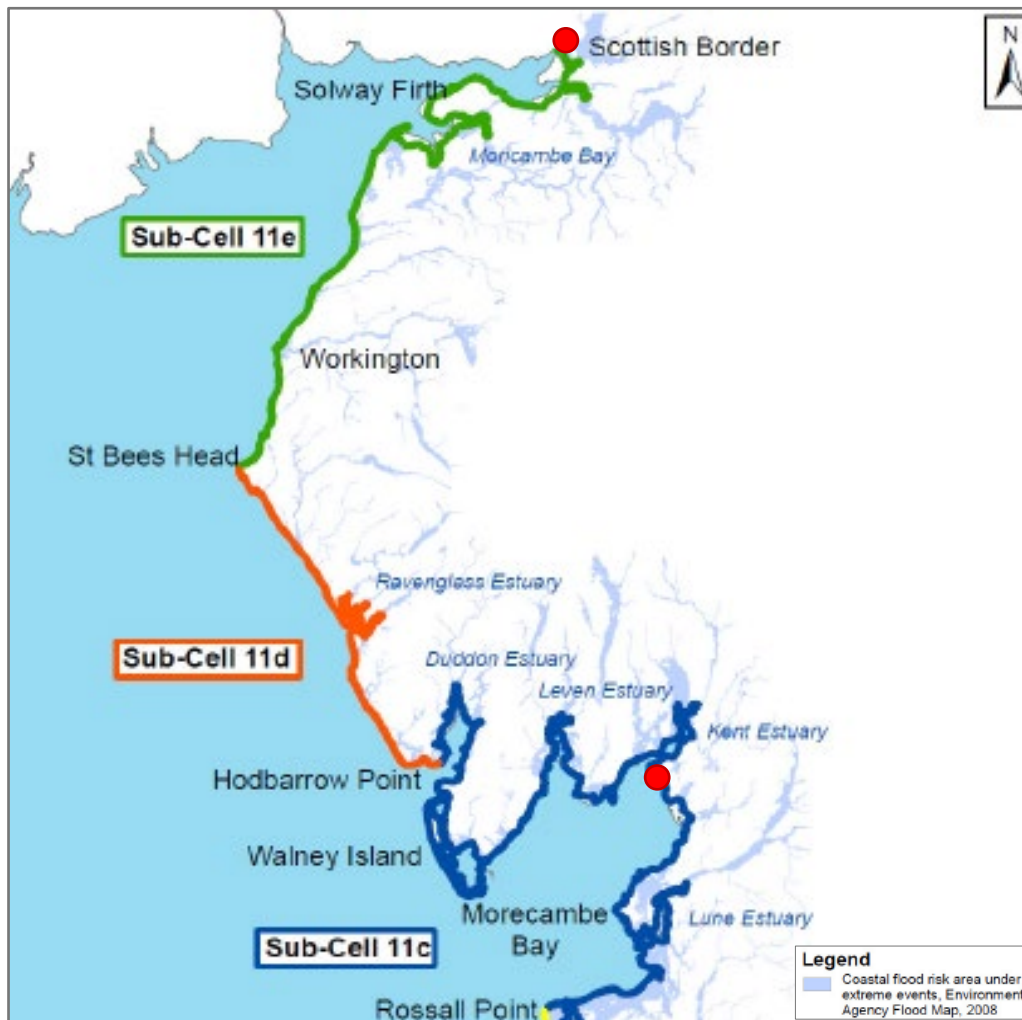


Figure 2 Map showing the SMP sub-cells included within the Strategy (extents shown by red dots)

Each sub-cell is further divided within the Shoreline Management Plan into smaller interacting areas of open coast or estuaries, known as **policy areas**, which cover a number of **policy units**.

The policy areas and units are identified by a number which increases sequentially along the shoreline from south to north. Each frontage has a number that identifies the SMP sub-cell, policy area and policy unit, for example policy unit 11c10.2 refers to sub-cell 11c, policy area 10, policy unit 2.

Table 1 shows the 24 policy areas included in this Strategy and the district they fall within.

Table 1 Policy areas and local authority districts covered by this Strategy

Policy Area	District	Policy Area	District
11c8: Heald Brow to Humphrey Head	South Lakeland DC	11d4: Drigg Point to Seascale	Copeland BC
11c9: Kent Estuary	South Lakeland DC	11d5: Seascale to St Bees	Copeland BC
11c10: Humphrey Head to Cark	South Lakeland DC	11d6: St Bees	Copeland BC
11c11: Outer Leven Estuary	South Lakeland DC	11d7: St Bees Head	Copeland BC
11c12: Leven Estuary	South Lakeland DC	11e1: St Bees Head to Whitehaven	Copeland BC
11c13: Bardsea to Piel Island	South Lakeland DC Barrow BC	11e2: Whitehaven to Workington	Copeland BC, Allerdale BC
11c14: Walney Island	Barrow BC	11e3: Workington to Maryport	Allerdale BC
11c15: Walney Channel (mainland)	Barrow BC	11e4: Maryport to Dubmill Point	Allerdale BC
11c16: Duddon Estuary	Barrow BC, South Lakeland DC, Copeland BC	11e5: Dubmill Point to Silloth	Allerdale BC
11d1: Hodbarrow Point to Selker	Copeland BC	11e6: Silloth to The Grune	Allerdale BC
11d2: Selker to Eskmeals	Copeland BC	11e7: Moricambe Bay	Allerdale BC
11d3: Ravenglass Estuary Complex	Copeland BC	11e8: Cardurnock to Scottish Border	Allerdale BC, Carlisle CC

2 Structure of this document

The primary objective of a coastal defence management strategy is to set out the framework for managing the risk of coastal erosion and flooding to people and the developed environment, whilst recognising possible impacts on the natural environment, potential long-term affordability and sustainability issues.

Sections within this document:

The strategy process	Explains the development of this Strategy: • defines steps in the strategy process • describes the overall approach and definition of priority and non priority units • outlines the appraisal process • appraises the shoreline management plan policies
Strategic Plan (summary)	For each policy area a summary is presented describing: • strategic direction for the policy area • preferred approach for each policy unit • recommended implementation activities

Supporting reports

In developing the Strategy, the current situation has been fully appraised including: assessing what is at risk now and in the future; the existing arrangements for managing these coastal risks; the key characteristics of the coastline and how these may be affected by future management; and the costs and benefits associated with future management activities. This detailed information is available in a series of separate documents, which, together with this report, form supporting technical evidence to the Strategy Appraisal Report (StAR):

Detailed Appraisal Reports	A series of 24 technical appraisal reports, providing detailed appraisals for each policy area
Action Plan	Sets out follow-on activities that will be needed over the next 10 or so years. These have been identified for each frontage and range from implementing schemes to monitoring and planning.
Baseline Information Report	This report was prepared at the beginning of the strategy development study to summarise the baseline data and information available to inform development of the Strategy. It includes details on: • the SMP and supporting coastal process studies, • national guidance & legislation, • national, regional and local data sets, • previous coastal strategies, studies and proposals, • land use plans (Local Plans),

	• scheme appraisals and other previous reports provided by project partners.
Risks, Issues & Opportunities Report	This report provides detailed baseline information on coastal processes and coastal defence conditions and summarises identified issues, risks and opportunities along the Strategy coastline. It includes the following: • Detailed information and baseline understanding of coastal processes and shoreline behaviour: this has been based upon updating information from previous studies supporting the SMP, supplemented with latest understanding from interpretation of results from the North West Regional Monitoring programme to develop up to date summary information on conceptual understanding of coastal process and shoreline change. • Mapping of erosion risk, based upon the latest Environment Agency national coastal erosion risk mapping (NCERM) data: maps are included, which show for each policy area erosion predictions for a <u>no active intervention</u> scenario. • Mapping of flood risk, based upon the Environment Agency Flood Map, showing flood extents for each policy area. • Coastal defence condition data, based upon asset inspection data compiled from annual asset inspections undertaken as part of the North West Regional Monitoring Programme, supplemented by information provided by CCC Highways Authority, Highways England and Network Rail. • Summaries of engagement with key project partners to understand their issues, opportunities and requirements of the strategy outcomes including risk workshops held on 29 and 30 August 2017.
Strategic Environmental Assessment (SEA) Report	This builds on the baseline data reviews mentioned above and identifies the key environmental receptors that require detailed assessment within the SEA report. The SEA Scoping Report was formally consulted on with the SEA statutory bodies in January 2018. Following identification of draft preferred options for the strategy the full SEA report has been developed and was consulted on with the statutory bodies alongside the draft strategy in December 2019.
Economic Appraisal Report	This report details the methodology and assumptions used in the evaluation of benefits and costs associated with the proposed options.
Habitats Regulations Assessment Reports	The Habitats Regulations Assessment considers the implications of the strategy on the internationally designated sites for nature conservation and includes 3 stages – Screening, Appropriate Assessment and Statement of Case.
Water Framework Directive (WFD) Assessment Report	This report assesses the preferred strategic approaches against the requirements of the Water Framework Directive to check compliance.
Stakeholder Engagement Report	This report summarises the stakeholder engagement activities undertaken as part of the Strategy development.

The StAR itself summarises the overall business case and justification for the strategy and is required by the Environment Agency to gain approval for future schemes and help secure public grant aid monies.

3 The Strategy development process

The Strategy looks to ensure an integrated approach to management of the coastline, which takes account of how decisions in one area could affect other areas. Development of the Strategy has considered risks, constraints and opportunities across the Cumbria coastal area, reflecting community and business aspirations, coastal dynamics, the natural and historic environment, and funding.

Background

The characteristics of the Strategy area, relating to both natural and human factors, significantly affect decisions on future shoreline management. These factors bring both opportunities and constraints and have been taken into account in the development of sustainable strategic approaches.

The Cumbrian coast supports a diverse range of industries and businesses, and remnants from its industrial heritage are also prevalent along the coast. Continued protection of these features, the communities they support, and the related infrastructure they require, is central to ensuring increased long term security and investment.

Another key consideration in developing the strategy has also been how future management will affect the natural environment. The Cumbria coast is highly valued for the habitats and species it supports, with large parts of the open coast and estuaries designated for their environmental importance. Parts of the area are also defined as Areas of Outstanding Natural Beauty and sections of the coastline lie within the Lake District National Park and World Heritage Site and Hadrian's Wall World Heritage Site.

A more strategic forward looking approach to shoreline management, which moves away from the current reactive emergency works approach, will enable partners to work together better and multiple benefits of schemes to be realised. A strategic approach should also enable better exploration of funding mechanisms to support such schemes. Furthermore, a strategic approach to repairs and improvements to the significant lengths of defences to the coastal highways and railways should enable cost savings for the works and reductions in and avoidance of unplanned disruption to traffic.

Adopting a strategic approach to shoreline management is also an opportunity to raise awareness of coastal dynamics, including coastal change, and the role of natural features such as coastal sand dunes, vegetated shingle, and salt marsh in protecting the coast and ensuring that coastal development is sustainable. In some areas, it is recognised that future works to continue to protect hinterland assets, could result in direct loss of valuable habitats. In these areas the strategy has recognised the need to identify and secure compensatory habitat to offset these losses.

Engagement with others

A key aspect of developing this Strategy has been working together with key stakeholders along the coast, recognising the role that they will play in implementing the Strategy. In addition to the local authorities and statutory consultees (Environment Agency, Natural England, Marine Management Organisation and Historic England), key organisations, including Network Rail, Highways England, United Utilities, Whitehaven Harbour Commissioners and Sellafield Ltd, have been involved throughout the development of the Strategy as part of a Project Review Group (see **Engagement Report** for further details).

There has also been regular engagement with the general public to share information and seek feedback on the Strategy, through drop-in events and on-line consultations and a project website page that has been updated every month.

Key features of the Strategy area



Leven Estuary

The Strategy includes the estuaries of the Kent, Leven (both of which sit within the estuary complex of Morecambe Bay), Duddon, Ravenglass, Moricambe Bay and Solway Firth.

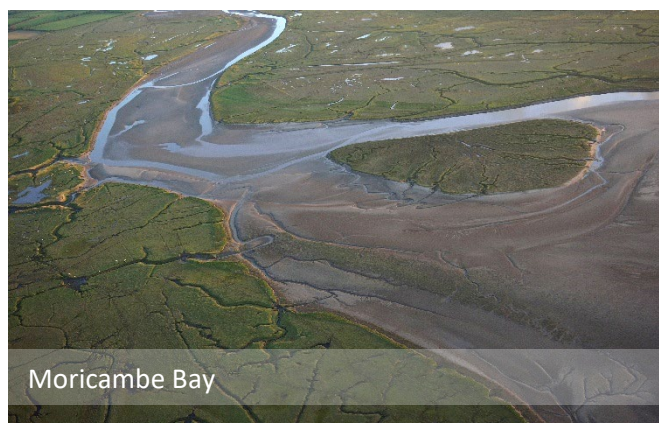
These estuaries are extremely important areas for the agricultural communities they support, their natural habitats and their landscape value, which attracts significant visitors to the area.

Historically, the estuaries have been significantly modified by

the construction of railway embankments and viaducts and the margins of the estuaries have been reclaimed for agricultural purposes. Within the Duddon there has also been industrial activity that has changed the shape of the estuary.

Flooding is a key risk in these areas, with extensive flood plains a prevalent feature. Whilst in some areas tidal flooding is less of a risk than fluvial or pluvial flooding, particular issues occur when high tides coincide with an extreme rainfall event. Land drainage is also a related issue. Many of the defences in these areas consist of earth embankments, with stretches of more substantial defences generally lying along sections of railway and road. Over time these estuary areas have tended to infill with sediment but localised areas of erosion occur due to the shifting nature of the low water channels. Where channels lie close to the coast they result in increased flows and wave action along the estuary bank, leading to erosion. This can result in undermining of or damage to coastal defence structures if they are present. In the future, the direct impact of sea level rise within the estuary areas is expected to be less than elsewhere in the UK, at least initially, due to the availability of sediment supply which should enable the estuary intertidal flats to keep pace with the rate of rise. However, these areas will remain vulnerable to extreme events and continued investment in defences, whether along their existing alignments or further inland, will be required to prevent large scale flooding.

The estuary margins also, however, offer significant potential to create new intertidal habitat and to improve existing habitats through restoring dynamic processes, which in turn can help reduce flood risks. This may be through managed realignment or tidal exchange schemes. There are also opportunities to consider or promote future adaptation to make agricultural land use more robust to future climate change impacts, for example by adopting lower intensive grazing and accepting more frequent flooding onto reclaimed former marshland.



Moricambe Bay

However, any modifications to the current defences within the estuaries needs to be considered in combination with impacts on flows in and out of the estuary and possible consequences elsewhere. There remain some gaps in understanding relating to the wider estuary area, particularly related to sediment sources, transport pathways and fluxes to the estuary, and likely response of the estuary to any large-scale

managed realignment. Therefore, whilst potential opportunities have been identified in the Strategy, further studies are required to confirm suitability.

Along the open coast, the geology and geomorphology varies from the resistant headland of St Bees Head to more readily eroded landforms, such as glacial till cliffs and cliffs cut into industrial spoil. As a result, the risk of erosion also varies. As numerous socio-economic assets are located along the coastal edge, many of these would be at risk should erosion continue or accelerate. There is also increasing pressure on the coastal zone from the expansion of urban housing and industrial developments, and associated infrastructure, principally in the vicinity of Workington, Whitehaven and Maryport.

Large sections of the coast are defended, either by formal defences or by a railway embankment; as such the level of risk depends upon the state of these defences. Historically erosion along this coast has been predominately driven by storm events, rather than sea level rise. However, the expected future increase in the rate of sea level rise plus any increase in the frequency or severity of storms will put increased pressure on these defences. Another risk from erosion is the release of contaminants – there are several examples within the Strategy area of landfill sites located at the coastal edge, some of which are already experiencing erosion, and the spoil from past industrial activities poses a potential contamination risk in several locations.



Cumbria Coast Railway

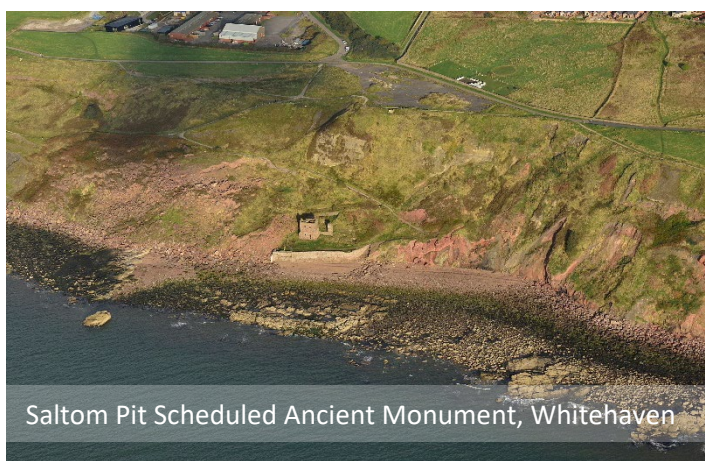
Key transport links within the Strategy area, both road and rail, are commonly based on old trading routes, and lie close to the coastal and estuary margins, which makes them vulnerable to erosion and flooding. In many locations these are strategic links, locally and regionally important for communities and businesses.

In the future, many of these transport links will come under increased pressure, due to ageing defences, changes to channel patterns in the estuaries, sea level rise and any increase in storm frequency or severity. In some locations there are

opportunities to relocate or divert roads away from erosion hot spots, subject to funding, but until plans have been completed there will be a need to continue to protect these and respond to storm incidents. Elsewhere, opportunities to relocate are more limited due to other constraints.

With the decline of other industries, tourism and recreation has become increasingly important to the area. With good transport links to major conurbations in the North West, the Cumbria coast offers significant opportunities for the growth of nature-based tourism. The England Coast Path together with development of a national cycle network form an essential element of this, by providing alternative recreational opportunities for users and promoting a green visitor economy. Development of these initiatives do, however, need to take account of the sensitive habitats and species of the coastal margin and strategic plans for the coast and estuaries.

The coast has a high heritage value, covering all epochs from prehistoric through to the industrial and modern age. There are, however, locations where historic sites are being lost to coastal erosion and increases in flood risk due to climate change likely to affect further areas. Where loss of historical features due to coastal erosion is unavoidable, opportunities should be sought to record archaeological evidence and, where appropriate, secure off-site conservation of artefacts at risk from coastal change.



Saltom Pit Scheduled Ancient Monument, Whitehaven

Funding for implementing the strategy

This strategy sets out a new approach to managing Cumbria's coastal defences. It provides a common plan for the strategy partners with responsibilities for managing defences and access to national funding, i.e. the local authorities, Environment Agency, Network Rail and Highways England, to work together and with other organisations and landowners with defence responsibilities or land and assets at risk such as, Sellafield Ltd, LLWR, United Utilities, Whitehaven Harbour Commissioners, National Trust and others.

In many locations this partnership working will enable opportunities for collaboration to allow more to be done by working together than could be afforded alone. Using the strategy to plan to align the different funding streams available to the partners will help them secure public and private contributions to the cost of coastal defences and help gain approvals required to implement schemes and studies.

The funding from central government specifically for managing flood and erosion risk in England is known as 'Flood Defence Grant in Aid' or 'FDGiA'. This is only available to the local authority and the Environment Agency but can be used to contribute towards 3rd party schemes that deliver the funding objectives. The amount of FDGiA available for a particular scheme takes into account the number of households protected, the estimated value of damages being prevented and the other benefits a particular project would deliver, such as environmental improvements.

Until recently central Government would provide 100% FDGiA funding for schemes that met their objectives, but only higher priority schemes which were determined to provide the best economic benefits received this funding. A change to the funding rules means that partial funding is now available - schemes with external contributions and which demonstrably deliver the required outcomes can receive a portion of FDGiA determined by the Defra / Environment Agency Partnership Funding Calculator. However, every case must demonstrate that expected whole-life benefits exceed the whole-life costs of the scheme. There is a limited amount of FDGiA funding available from the Government, with schemes offering greater benefits and larger numbers of households protected more likely to secure FDGiA funding contributions.

Economic assessment for the strategy has indicated that it is unlikely that measures identified by this Strategy will be eligible for full funding from FDGiA. Some projects may qualify for partial FDGiA funding and so can go ahead if other funding can be found to meet the remainder, or in many cases, the majority of the cost. For example, a project qualifying for 70% national FDGiA funding may still go ahead if costs are reduced by 30%, a 30% partnership contribution is available, or a combination the two. The strategy provides estimated costs of future works and brings the partners together with a common plan so that mechanisms to secure funding streams can be developed.

Many of the defences on the Cumbria coast are managed by organisations other than the Environment Agency and local maritime authorities. Potential non-FDGiA funding sources include:

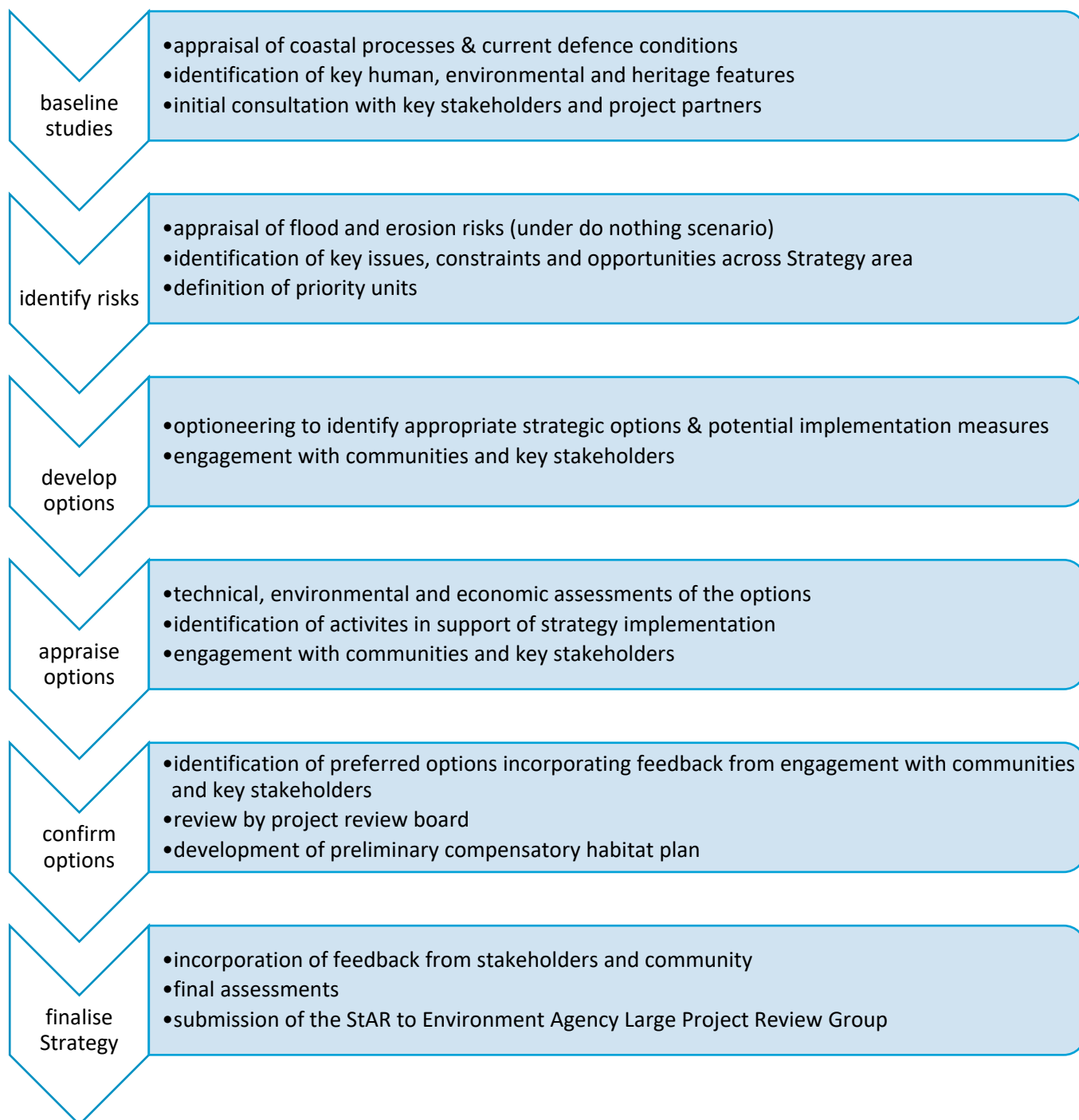
- Project partners not eligible for FDGiA, including Network Rail, Highways England, United Utilities, Cumbria County Council acting in their role as Highway Authority,
- 'Local Levy' funding from Regional Flood and Coastal Committees,
- Local businesses and property owners,
- Community groups (including Parish Councils),
- Local Enterprise Partnerships (LEP),
- Others who would benefit from the scheme, e.g. land and property owners.

There are also areas along the coast where it is unlikely that a project would qualify for any FDGiA. Works in these locations will need to be funded entirely by external contributions. This will include locations where there are defences to coastal highways or the railway but no households are directly protected.

Successful implementation of the strategy will therefore depend upon the partners that have come together through the **Project Review Group** continuing to work together to source additional funds to implement their responsibilities within the strategy **Action Plan**.

Steps in the Strategy development process

The following flow diagram summarises the key steps undertaken in development of this Strategy:



Approach to the Strategy appraisal

The coastline covered by the Cumbria Coastal Strategy is significantly more extensive than would usually be considered at strategy level. For this reason, focus has been on developing measures for stretches of coast where a need to implement a change from current management, either as a result of key issues or risks to assets or where opportunities for improvement have been recognised. **These frontages have been termed *priority units*.**

The focus on priority units for option development and assessment does, not however, negate the need to consider wider scale impacts and benefits nor to consider whether other areas of the Strategy coastline could present opportunities for environmental improvements or mitigation measures. Whilst it is preferable that any mitigation is undertaken within the same conservation area as the impact, there are examples elsewhere in the UK where this has not been the case. For this reason, the priority units have not been considered in isolation and each priority unit is considered within the context of adjacent frontages within the policy areas defined within the SMP.

Appraisal process for priority units

In line with the Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG), development and appraisal of strategy options has followed a staged approach as described below.

Stage 1 identification of priority units

Priority units have been identified through consultation with the Project Review Group and are defined in the **Risks, issues and opportunities Report**. They represent stretches of frontage where:

- there are key assets at risk from flooding or coastal erosion over the next century (the Strategy lifetime)
- the SMP policy has been queried, for example due to a change in risk or new information, or
- where there may be environmental opportunities, which could bring benefits to an area.

Following the identification of priority units, the approach has differed depending upon whether a frontage has been defined as a priority or non-priority unit. In both cases the reporting of the process has been undertaken based on SMP Policy Areas.

Stage 2 (priority units)

For **priority units**, the *second stage* has been a review of SMP policies. The Shoreline Management Plans form the framework for future management and a key stage in strategy development has been appraisal of the policies set at Shoreline Management Plan level. At some locations, there have however been changes in either the physical condition of the coast, understanding of coastal risks or land use changes since the SMP was developed, which has required the rationale behind Shoreline Management Plan policies or proposed actions to be re-appraised.

Stage 3 (priority units)

The *third stage* has been the **identification of a long list of feasible options**. The aim of this stage is to identify the broad range of measures for each priority unit that could deliver the current SMP policy (or recommended revised policy) for the frontage.

Stage 4 (priority units)

The *fourth stage* has been to **develop a short list of feasible options**, through screening out long list options based on technical suitability, economic viability and social and environmental factors.

The scale of the coastline covered by this Strategy means that the issues and therefore approach to considering options varies from area to area. Within the priority frontages, the following different situations have been identified:

- SMP appropriate - the SMP policy does not need review so the aim of the strategy is to develop measures to implement the policy. Future works to manage flood and erosion risk may be eligible for a proportion of FDGiA funding and the economic appraisal will consider costs and benefits, following FCERM-AG guidance.
- Possible change to SMP policy – issues have been raised regarding the current policy. The strategy will consider possible measures taking account of a possible change to policy. Future

works to manage flood and erosion risk may be eligible for a proportion of FDGiA funding and the economic appraisal will consider costs and benefits, following FCERM-AG guidance.

- Privately owned or funded defences – these are locations where the SMP policy may allow hold the line subject to private funding / investment. The strategy will investigate the performance/ impact of the defences and make recommendations on measures to ensure a strategic solution along the frontage. It is unlikely that these locations will attract significant FDGiA funding – here the focus will be on considering varying costs of approaches, environmental impacts on the wider coast and making recommendations accordingly.
- Proposed future developments – these are locations where the SMP policy may still be appropriate for current hinterland assets but where future developments are proposed. Here the strategy will consider possible measures taking account of a possible change to policy. Future/ proposed developments cannot be included in FDGiA - here the focus will be on considering varying costs of approaches, environmental impacts on the wider coast and making recommendations accordingly.

Stage 5 (priority units)

The first part of stage 5 has been to develop and appraise the short list options for each priority area. This was followed by Stakeholder engagement on the draft short-listed options, which took place in November and December 2018.

The final part of stage 5 has been to **confirm a preferred strategic approach** or option taking account of the appraisal of short-listed options and feedback from the options stage public engagement. The relative cost of options has been taken into consideration within the appraisal, alongside environmental, technical and sustainability factors. **Future actions** have also identified at this stage, setting out activities required over the next 10 or so years. Public and partner engagement on these preferred options and proposed actions was undertaken in November and December 2019.

Appraisal process for non-priority units

For non-priority units, a light-touch approach has been applied. This has involved:

- Identifying the existing approach to flood and coastal erosion risk management – considering the existing SMP policies and assumptions and current defences/ management.
- Identifying key strategy considerations – these include changes to the coast, landscape or designations since the SMP, issues highlighted during consultation and any other relevant information.
- Discussion – this firstly identifies whether there is justification for a change in SMP policy. Where appropriate, measures to implement the SMP option discussed.
- Proposed strategic way forward – this section recommends any activities that may be required, focusing mainly on the next 10 or so years. At this point the Strategy is likely to be reviewed again and updated, taking account of monitoring information and subsequent developments.
- Public and partner engagement on the proposed strategic way forward and associated actions was undertaken in November and December 2019.

Identification of priority units

From discussion with the Strategy Project Review Group, made up of key stakeholders; risk workshops held at project inception; and subsequent one to one discussion with project partners, a number of priority units have been selected. These are listed below, together with the rationale for defining them as priority units and the key aspects that the Strategy will need to consider. Further information on the selection of the priority units is contained in the **Risks, Issues and Opportunities Report**.

Maps illustrating the areas follow Table 2 below (Figure 3 to Figure 5).

Table 2 Priority units and key considerations for the Strategy

Rationale for priority units	Key considerations for Strategy
11c9 Kent Estuary (all policy units)	
This is a key area at risk from flooding. There are particular concerns regarding the future viability of the A590 which runs along the margins of the estuary at is vulnerable to flooding. There are opportunities for environmental enhancement through managed realignment, which would offset losses due to coastal squeeze, however this would have an impact on adjacent agricultural land. Internal flood management has recently changed – there therefore needs to be consideration of how to integrate terrestrial and marine management.	Reassess viability of SMP policies. Consider technical options for managed realignment which could bring both environmental benefits and reduce flood risk to economic assets. At a local level, there are issues with fluvial outfalls where beach material builds up in the discharge channels across the foreshore and reduces the gravity outflow, thereby affecting inland drainage. Advise on a long term strategic approach to managing flood risk throughout the estuary, taking account of the long-term plans for the A590.
11c10: Humphrey Head to Cark (11c10.2)	
Private defences have been constructed at Bourne Leisure caravan park – there are concerns regarding impact on adjacent marshland, which is currently part of an improvement scheme. Permission has also recently been granted for a tidal lagoon scheme seaward of the shoreline.	Consider environmental impact of defences and their long-term viability at Bourne Leisure site.
11c11 Outer Leven Estuary (11c11.4)	
Since the SMP there have been proposals for development of Ulverston and its infrastructure, which would have implications for the areas at risk. The proposed expansion of the Glaxo (GSK) site has been cancelled but any future proposals for the site need to be taken into account. There are also potential environmental opportunities, if managed realignment is viable. This could offset losses due to coastal squeeze, however would have an impact on adjacent agricultural land.	Review 11c11.4 to take account of proposals for Ulverston – align with any plans for managing inland flooding, and also consider any future proposals for the GSK site. Consider the viability, including potential impacts on the wider estuary of implementing managed realignment.
11c12: Leven Estuary (11c12.3)	
This is a key area at risk from flooding – assets at risk include agricultural land, farmsteads and the main coastal road. Some minor issues have been identified along the approach railway embankments on either side of the Leven Viaduct. There are plans in place regarding the main coastal road at Greenodd, which would involve realignment of the route. There is also a proposed extension to	Reconsider long term policy for 11c12.3 and location of boundaries 11c12.1/2 and 11c12.2/3 given possible future infrastructure works. At a local level, there are issues with fluvial outfalls where beach material builds up in the discharge channels across the

Rationale for priority units	Key considerations for Strategy
the national cycle route, which could potentially use the disused railway line. There are also potential environmental opportunities, if managed realignment is viable.	foreshore and reduces the gravity outflow, thereby affecting inland drainage. Consider technical options for managed realignment which could bring both environmental benefits and reduce flood risk to economic assets.
11c13: Bardsea to Piel Island (11c13.2, 11c13.3/11c13.4)	
There are both flood and erosion risks to this frontage, with potential consequences for the future viability of the main coastal link road, A5087, as well as isolated properties. Some sections of defences within 11c13.2 are currently in a poor condition. There are extremely sensitive habitats within the intertidal zone around Roa Island, therefore the policy of hold the line has been questioned depending on what defences would be required to implement this. Since completion of the SMP, there has been a specific study considering Roa Island. There are potential environmental opportunities in 11c13.2 through implementing managed realignment, but this needs to consider plans for A5087.	Consider strategic management of defences to protect A5087, in line with any long-term plans. Consider appropriate implementation measures around Roa Island, given the sensitivity of intertidal habitats – taking account of conclusions from the Roa Island Study (2010)
11c14: Walney island (all units)	
Walney Island is the only part of the Cumbria coast that already has an FCERM strategy, which was approved by Barrow Borough Council and the Environment Agency in 2014. As the Walney strategy considered options for implementing the SMP policies for all frontages no priority frontages were defined on Walney for this Strategy. However, the Walney Strategy proposals have been reviewed and updated where necessary based on latest monitoring and information provided by stakeholders in order to integrate Walney Island within this overall strategy.	
11c16: Duddon Estuary (11c16.3, 11c16.4, 11c16.5, 11c16.10 and 11c16.11/ 11d1.1)	
This is a key flood risk area, with agricultural land and properties at Millom and Haverigg potentially at risk, together with associated infrastructure, sections of railway line and access roads. The railway along Kirby-in-Furness (11c16.4 and 11c16.5) is particularly vulnerable to flooding and undermining due to the proximity of the low water channel resulting in bank erosion. Recent defences have been undertaken as emergency works, and future works anticipated, with potential consequences on habitat. There are potential environmental opportunities within the estuary through implementing managed realignment but require further consideration of wider impacts, such as changes in flows and	Review SMP policy for 11c16.13 given risks to assets. Consider strategic approach to managing risks to railway for 11c16.4 and 11c16.5. Also consider policies along the Millom and Hodbarrow frontages (11c16.10 and 11c16.11/ 11d1.1). Consider technical options for managed realignment which could bring both environmental benefits and reduce flood risk to economic assets. Advise on a more strategic approach to managing flood risk throughout the estuary.

Rationale for priority units	Key considerations for Strategy
implications for services buried beneath the marshland. The site of the old iron works at Red Hill has been identified as a potential wildlife mitigation area for the Moorside Site (note however that plans for the Moorside Site are currently uncertain). 11c16.3 – Askam sewage works at flood risk if there were erosion – longer term No active intervention policy queried. 11c16.10, 11c16.11 and 11d1.1 - the No active intervention policy has been queried due to the potential flood risk to Millom and sewage works.	
11d1: Hodbarrow to Selker Point (11d1.1)	
See above.	
11d2: Selker to Eskmeals (11d2.2)	
Key risk is erosion potentially resulting in loss of access road to Eskmeals MoD site – this is currently the only viable access as the alternative route road passes under Eskmeals viaduct and therefore has height/width and tide restrictions. SMP policy was to allow erosion-slowing measures. There was up to 5 m erosion along this stretch following 2013/14 storms.	Review SMP policy at 11d2.2 to appraise an appropriate way forward, through discussions with MoD/ QinetiQ.
11d5: Seascale to St Bees (all policy units)	
The key risk to the frontage is storm erosion of the beach and backing till cliffs. There are localised tidal flood risks beneath the railway bridges and within the River Ehen floodplain. The railway embankment currently plays a key role as the frontline defence – there are areas along the defence that are showing signs of erosion and Network Rail recognise the need for options/solutions to enhance the resilience of the defence along various sections. The SMP advised that Seascale required a scheme to address erosion issues – this has become more urgent following damage caused in 2013/14. Since the SMP there have been proposals relating to the Moorside development; however plans for the site have since been cancelled and the long term future of the site is currently unknown. Plans to extend the national cycleway are also underway. Additional properties have been constructed along the beach crest between Braystones and Seamill.	Consider defence of Seascale (11d5.1) following damage caused in 2013/14. Advise on erosion risk to proposed cycleway along 11d5.2. Review 11d5.3/4 boundary (or change in policy for 11d5.4) to take account of any future development of the Moorside site. Consider strategic approach to managing risk to beach properties. Consider strategic approach to managing risks to railway.

Rationale for priority units	Key considerations for Strategy
11d6: St Bees (11d6.2)	
Key risk is coastal erosion which could result in loss of land and ultimately properties at St Bees. Some localized flood risk associated with the watercourse. Concern regarding residual life of promenade and issues of outflanking to south.	Consider implementation option at 11d6.2, considering possible funding mechanisms.
11e1: St Bees Head to Whitehaven (11e1.4)	
Since the SMP there has been rapid erosion of former mine spoil threatening the south breakwater and proposed development.	Review SMP Policy at Whitehaven South Beach (11e1.4).
11e2: Whitehaven to Workington (11e2.2, 11e2.3, 11e2.4, 11e2.5, 11e2.7, 11e2.8, 11e2.9, 11e2.10)	
A key risk is coastal erosion of the cliffs, some of which are composed of old spoil deposits. Since the SMP there has been development of the former CORUS site (11e2.8/2.9), therefore assets at potential risk have changed (and will increase further in future). The policy of No active intervention at 11e2.9 has been questioned due to the risk of contamination from erosion of former landfill. The section of railway between Parton and Harrington is vulnerable to tidal flooding, as runs along the back of the beach. There have also been issues with regard to the stability of cliffs which lie behind the track as well as evidence of erosion, scour and wash out along the sea defences. Currently issues of siltation within Workington Harbour, which may relate to erosion to south.	Review SMP policy to take account of new developments at 11e2.8, with reference to reports produced in association with the site. Consider plans for quarry site to north of 11e2.8. Consider strategic approach to managing risks to railway along 11e2.2, 11e2.3 and 11e2.4.
11e3: Workington to Maryport (11e3.1 and 11e3.2)	
A key risk is coastal erosion of old spoil deposits which form the backshore morphology. There are some localised flood issues related to culverted outfalls and concerns regarding Port of Workington structures, namely the southern breakwater extension and the north beach retaining wall. There is also concern regarding the slag bank area to the north of Workington which has recently eroded significantly. North of Siddick the railway embankment forms the frontline defence and is vulnerable to tidal flooding as it lies at the back of the beach. There is evidence of erosion along the Flimby stretch and accumulation of silt and beach material has caused significant obstruction on the bridge approaches.	Consider contamination risk and economic justification for alternative policy implementation measures at 11e3.1, taking account of long term plans for onshore windfarm. This will also need to take account of issues raised by Port of Workington regarding harbour structures. Strategy needs to take account of long term plans for railway line and future investment in embankment, which also forms artificial defence. At a local level e.g. at Flimby, there are issues with culverts/ outfalls becoming

Rationale for priority units	Key considerations for Strategy
There is potential for redevelopment of former industrial sites, e.g. at Flimby, but this would rely on securing coastal protection from erosion. Policy of Managed Realignment at 11e3.1 may have implications due to highly contaminated nature of site – however alternative would require funding.	blocked by beach material – resulting in inland drainage issues.
11e4: Maryport to Dubmill Point (11e4.3, 11e4.4, 11e4.5 and 11e4.6)	
The key risk is coastal erosion, which could result in loss of main coastal road (B5300) – there are several ‘pinch points’ along the frontage. Since the SMP, feasibility studies have been considering the potential for the road to be re-routed. Informal defences have been placed along the Maryport Golf Course – a longer term strategy for area is required.	Consider sustainability and options for the B5300, taking account of impacts on services, historical features and proposals for national cycle network. Take account of issues along Maryport golf course frontage (11e4.3).
11e5: Dubmill to Silloth (11e5.1)	
The key risk is coastal erosion – much of coastline is currently stable but there are ‘pinch points’, where risk is to coastal road (B5300). New defences have been constructed since the SMP, contrary to the SMP policy of managed realignment.	Consider sustainability and options for the B5300, taking account of impacts on services, historical features and proposals for national cycle network.
11e6: Silloth to The Grune (11e6.2)	
The key risk is coastal erosion – ongoing erosion of beach, dunes and backshore is resulting in loss of land and also impacting on defences. SMP recommended that the strategy should consider adverse impact of policy on internationally designated sites.	SMP policy needs to be reviewed to assess how ongoing trend of erosion will be addressed, taking account of risk of outflanking. Also consider unit boundary location between 11e6.2 and 11e6.3.
11e8 Cardunock to Scottish Border (11e8.2 and 11e8.7)	
There are risks from both flooding and erosion. SMP policy of Managed Realignment at 11e8.2 has been queried as defences here protect a number of properties. At Rockcliffe, the SMP policy is currently Hold the Line although there are no formal defences here. The coastal road (U1068) to the west of this frontage is prone to flooding and has previously suffered water damage and erosion. There have been investigations to consider the issues. There are potential environmental opportunities within the estuary through implementing managed realignment but requires further consideration of technical viability and wider impacts.	Reconsider options for 11e8.2, looking at potential wider impacts. Reconsider policy options for 11e8.7, taking account of recent reports on the U1068. Impact of changes in management need to be considered for wider estuary. Consider environmental opportunities that could bring benefits to wider Strategy area.

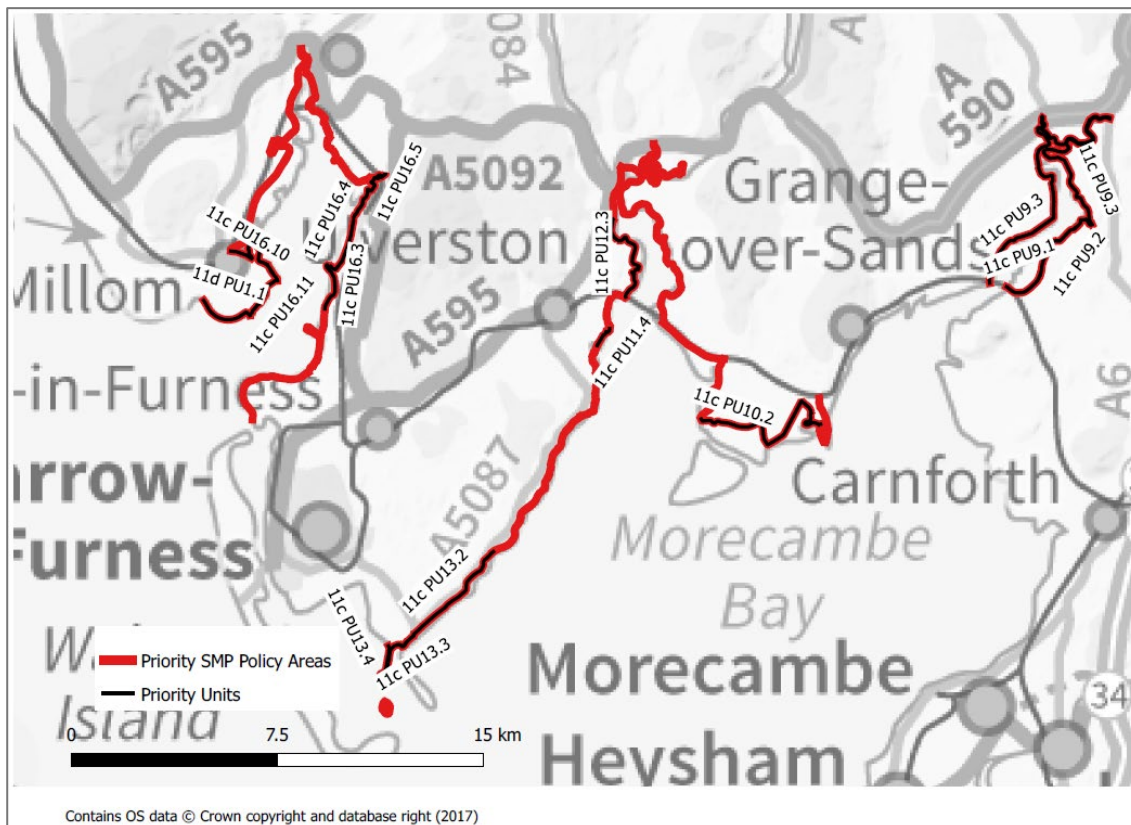


Figure 3 Priority units in sub-cell 11c

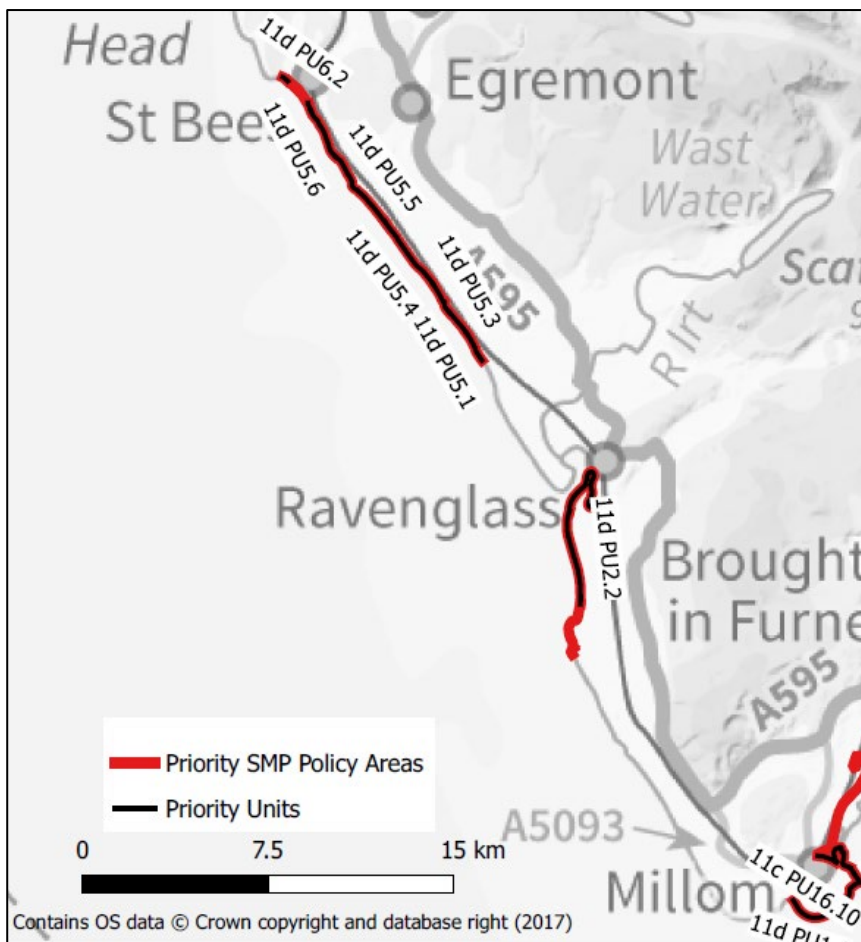


Figure 4 Priority units in sub-cell 11d

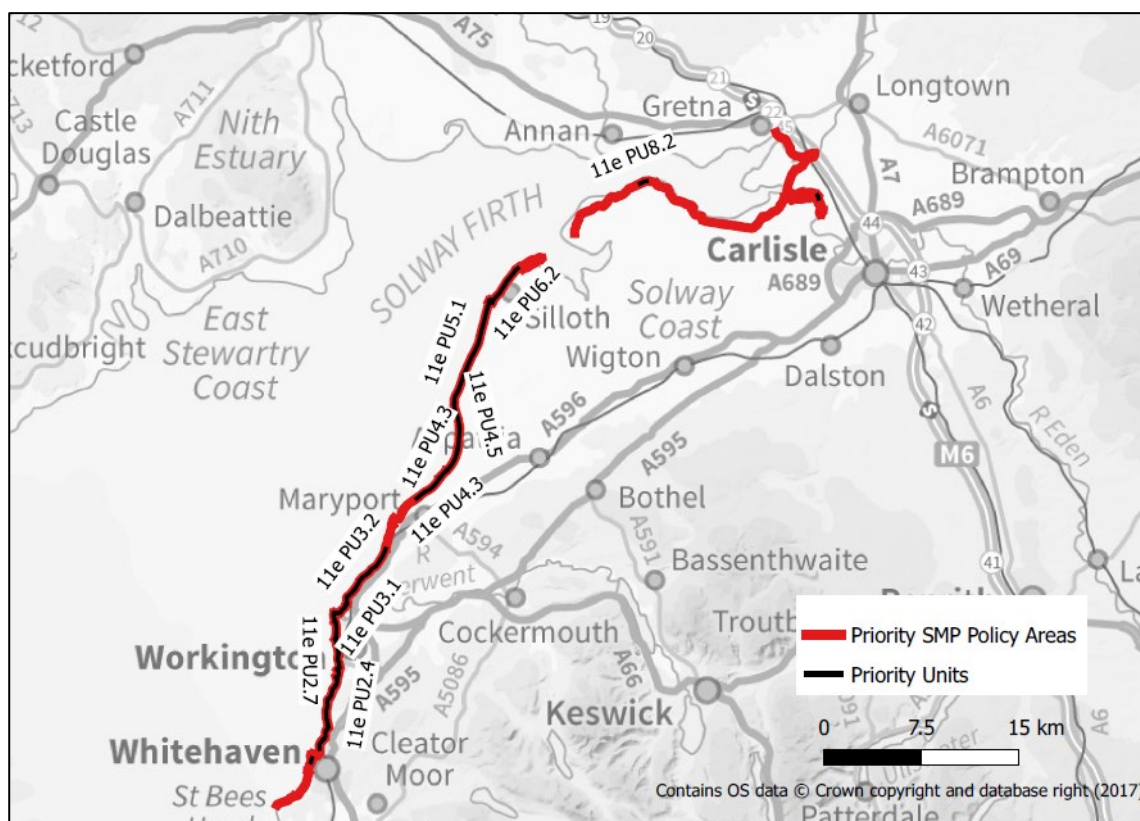


Figure 5 Priority units in sub-cell 11e

Review of current Shoreline Management Plan policies

Four generic Shoreline Management Plan policy options were considered by the Shoreline Management Plan, as shown in Table 3. These generic policies were used in all Shoreline Management Plans in England and Wales in accordance with the national guidance, Defra (2006). There have been no changes to the policies for Cumbria since adoption of the SMP in 2012.

Table 3 Descriptions of the four shoreline management policies used in Shoreline Management Plans (based on information in Halcrow, 2011)

Policy Option	Description
No active intervention (NAI)	Where there is no further investment in coastal defences or operations. Situations within the SMP include: - Currently undefended stretches of coast where there is no need for intervention to manage risks. - Areas where it is important to allow sediment to erode from cliffs to feed beaches or to allow beaches, dunes or saltmarsh to adjust or rollback naturally as sea levels rise. - Some locations where there is insufficient national economic justification to maintain defences in the long term and therefore no funding available from public sources (although in some locations private defences already exist and privately funded maintenance of these would be permissible subject to obtaining the necessary consents and that there would be no adverse effects on coastal processes).
Hold the line (HTL)	Where the intention is to continue to manage risk to important assets and interests through keeping the shoreline in the same place. This could be achieved

Policy Option	Description
	by maintaining current defences or by constructing new defences in the future, although it does not necessarily mean that the current defences will be maintained in the same form in the future as the way the risk is managed may change over time. It includes the following situations: - Where work is carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on) to improve or maintain the standard of protection provided by the existing defence line. - Where work is carried out behind existing defences (such as building secondary flood defences) where this work would form an essential part of maintaining the current coastal defence system. In locations where a hold the line policy has been identified by the SMP this does not guarantee that funding will be available from public sources. In some areas defences are fully or partly privately owned and maintained.
Managed realignment (MR)	This policy option allows the shoreline to move forward or backwards in a controlled way to manage the risk from coastal flooding or erosion to assets and interests. Managed realignment provides the opportunity to create a more natural coastline by allowing sediment movement which helps maintain beaches or provides space for natural landward roll-back of saltmarsh, beaches or dunes in response to ongoing coastal change and sea level rise. Situations within the SMP include: - Where there are dune systems - the intent of MR is typically to allow the dune system to accrete and erode naturally (moving seawards and landwards) with limited intervention to manage risks and adapt to the changing coast. - In a small number of locations where there are currently eroding cliffs - MR is recommended to take the form of monitoring the cliff erosion and only intervene with defences to slow this erosion if or when assets are sufficiently at threat to justify defences. - Within estuaries, saltmarshes and mudflats - there are a number of opportunities to move defences landward, or to remove defences so the shoreline realigns back to higher ground, to create more space for saltmarshes and improve the natural defence and provide environmental benefits.
Advance the line (ATL)	This policy option primarily means that more land will be created by constructing new coastal defences into the sea, on the seaward side of the original defences. This policy has not been recommended in the SMP for this frontage.

Through consultation with the Project Review Group, a number of locations have been identified where the current Shoreline Management Plan policy has been queried: these are highlighted in Table 4 below. Many of these have also been defined as priority units and development of the long list of options has therefore taken these areas into account. There are some locations where the locations are not priority units, and these are considered within the appraisal of non-priority frontages.

Table 4 Current (2010) Shoreline Management Plan policies for each policy unit, indicating units where SMP policy requires further review (show as highlighted cells)

Policy Unit		Policy from 2010 (period in years)			Priority unit?	Review of current policies
		0-20	20-50	50-100		
11c8.1	Heald Brow to Frith Wood	NAI	NAI	NAI		
11c8.2	New Barns	NAI	NAI	NAI		
11c8.3	Grubbins Wood	NAI	NAI	NAI		
11c8.4	Meadow to the Kent Viaduct	HTL	HTL	HTL		
11c8.5	Kent Viaduct to Holme Island	HTL	HTL	HTL		
11c8.6	Holme Island to Humphrey Head (Grange-Over-Sands)	HTL	HTL	HTL		
11c9.1	Kent Viaduct to Dick Fell Road (Sandside)	HTL	MR	MR	Y	Options to consider possibility of realigning road and set back defences in 20 years +
11c9.2	Sandside (Dick Fell Road to Hollins Well Road)	HTL	HTL	HTL	Y	
11c9.3	Hollins Well Road north to Levens Bridge (east bank) & Levens Bridge to Kent Viaduct (west bank)	HTL	MR	MR	Y	
11c10.1	Humphrey Head	NAI	NAI	NAI		
11c10.2	Humphrey Head to Cowpren Point	HTL	MR (+HTL)	MR	Y	
11c10.3	Cowpren Point to Cark	NAI	NAI	NAI		
11c11.1	Cark to Leven Viaduct	NAI	NAI	NAI		
11c11.2	Leven Viaduct to Canal Foot cottages	NAI	NAI	NAI		
11c11.3	Canal Foot	HTL	HTL	HTL		
11c11.4	Glaxo Factory Site (south)	NAI	NAI	NAI	Y	Since the SMP there have been proposals for both the area surrounding Ulverston and the former GSK site. Options need to be flexible to take account of future changes in land use.
11c11.5	Sandhall to Conishead Priory	HTL	MR	MR		
11c11.6	Conishead Priory to Bardsea	NAI	NAI	NAI		
11c12.1	Leven Viaduct to Haverthwaite (left bank) and Haverthwaite to Greenodd (right bank)	HTL	MR	NAI	Y	Since the SMP, new plans have been put forward for the main coastal road. The possibility of changing the SMP unit boundaries to be considered.
11c12.2	Greenodd to Barrow End Rocks (A590)	HTL	HTL	HTL	Y	
11c12.3	Barrow End Rocks (A590) to Leven Viaduct	HTL	MR	NAI	Y	
11c13.1	Bardsea to Newbiggin	NAI	NAI	NAI		
11c13.2	Newbiggin to Rampside	HTL	MR	HTL	Y	
11c13.3	Rampside	NAI	HTL	HTL	Y	
11c13.4	Roa Island	HTL	HTL	HTL	Y	
11c13.5	Piel Island	NAI	NAI	NAI		

Policy Unit		Policy from 2010 (period in years)			Priority unit?	Review of current policies
		0-20	20-50	50-100		
11c14.1	South End Hawes to Biggar (east side)	NAI	NAI	NAI		Given recent coastal change – policy here may need to be reconsidered.
11c14.2	Biggar to Lenny Hill (east side)	HTL	HTL	HTL		
11c14.3	South End Hawes to Hare Hill (open coast)	NAI	NAI	NAI		
11c14.4	Hare Hill to Hillock Whins	HTL	HTL	HTL		
11c14.5	Hillock Whins to Nanny Point Scar	NAI	MR	MR		
11c14.6	Nanny Point Scar to Mill Scar	NAI	NAI	NAI		
11c14.7	Mill Scar to north of West Shore Park	MR	MR	MR		
11c14.8	North Walney - from north of West Shore Park to Lenny Hill (both coasts)	NAI	NAI	NAI		
11c15.1	Rampside to Westfield Point	NAI	NAI	NAI		
11c15.2	Westfield Point to Hindpool (Barrow in Furness)	HTL	HTL	HTL		
11c15.3	Hindpool to Lowsy Point	NAI	NAI	NAI		
11c16.1	Lowsy Point to Askam Pier	NAI	NAI	NAI		
11c16.2	Askam-in-Furness (including Askam Pier)	HTL	HTL	HTL		
11c16.3	Askam to Dunnerholme	NAI	NAI	NAI	Y	Askam sewage works at flood risk if there were erosion – longer term NAI policy queried.
11c16.4	Dunnerholme to Sand Side	HTL	HTL	HTL	Y	
11c16.5	Kirkby-in-Furness	HTL	HTL	HTL	Y	
11c16.6	Herdhouse Moss	NAI	NAI	NAI		
11c16.7	Galloper Pool to Viaduct	HTL	HTL	HTL		
11c16.8	Duddon Estuary (Both banks upstream of Viaduct and right bank south to Green Rd Station)	HTL	MR	MR		
11c16.9	Millom Marshes	HTL	MR	MR		
11c16.10	Millom Mine Works (Industrial area)	NAI	NAI	NAI	Y	This site has been identified as a potential inland wildlife mitigation area for Moorside.
11c16.11	Hodbarrow Mains	NAI	MR	HTL	Y	
11d1.1	Hodbarrow Point to Haverigg	HTL	MR	HTL	Y	The suitability of MR along Hodbarrow Lagoon has been queried – this could also affect the adjacent policy to the north.
11d1.2	Haverigg	HTL	HTL	HTL		
11d1.3	Haverigg to Hartrees Hill	NAI	NAI	NAI		
11d1.4	Silecroft (Hartrees Hill)	HTL	HTL	HTL		There are only private defences – possible long term issue here: any change/ extension to defences would require a HRA. Need to consider policy and likelihood of future private funding. Also planned development of a car park at Silecroft (Rayrick Hole) –

Policy Unit		Policy from 2010 (period in years)			Priority unit?	Review of current policies
		0-20	20-50	50-100		
						allowable under HTL policy – who pays for defences?
11d1.5	Hartrees Hill to Selker	NAI	NAI	NAI		
11d2.1	Selker to Stubb Place	NAI	NAI	NAI		
11d2.2	Stubb Place and Eskmeals Dunes	MR	MR	MR	Y	Long term options for maintaining road access to the MoD Eskmeals site need consideration, which may involve a change to SMP policy.
11d3.1	Eskmeals Dunes to Ravenglass including River Esk to Muncaster Bridge SMP boundary	NAI	NAI	NAI		
11d3.2	Ravenglass	HTL	HTL	HTL		
11d3.3	Ravenglass to Drigg Point including River Mite to Muncaster Mill and River Irt to Drigg Holme	NAI	NAI	NAI		
11d4.1	Drigg Point to Seascale	NAI	NAI	NAI		
11d5.1	Seascale	HTL	HTL	HTL	Y	
11d5.2	Seascale to Sellafield	NAI	NAI	NAI	Y	
11d5.3	Sellafield	HTL	HTL	HTL	Y	SMP policy or unit boundary review to be considered to take account of Moorside site.
11d5.4	Sellafield to Braystones	NAI	NAI	NAI	Y	
11d5.5	Braystones, Nethertown and Coulderton	MR	NAI	NAI	Y	
11d5.6	Coulderton to Seamill	NAI	NAI	NAI	Y	
11d5.7	Seamill to Pow Beck	HTL	HTL	HTL	Y	
11d6.1	Pow Beck to St Bees Promenade	NAI	NAI	NAI		
11d6.2	St Bees Promenade	HTL	HTL	MR	Y	
11d7.1	St Bees Head	NAI	NAI	NAI		
11e1.1	St Bees Head to Saltom Pit	NAI	NAI	NAI		
11e1.2	Saltom Pit	HTL	HTL	NAI		Cliff instability prevents access, suggesting an earlier change to NAI
11e1.3	Saltom Pit to Whitehaven	NAI	NAI	NAI		
11e1.4	Whitehaven South Beach	NAI	NAI	NAI	Y	More rapid erosion of cliffs at Whitehaven South Beach has implications for the harbour structures – therefore SMP policy may need to change to reflect options to maintain these structures.
11e2.1	Whitehaven Harbour and north beach	HTL	HTL	HTL		Proposals for land reclamation of c. 15 ha, within 5-10 years. If undertaken, the policy may need to change to ATL.
11e2.2	Bransty to Parton	HTL	HTL	HTL	Y	
11e2.3	Parton	HTL	HTL	HTL	Y	
11e2.4	Parton to Harrington Parks	HTL	HTL	HTL	Y	
11e2.5	Harrington Parks to Harrington Harbour	HTL	NAI	NAI	Y	Possible contamination risk, therefore HTL may be option beyond short term.

Policy Unit		Policy from 2010 (period in years)			Priority unit?	Review of current policies
		0-20	20-50	50-100		
11e2.6	Harrington Harbour	HTL	HTL	HTL		
11e2.7	Harrington to Steel Works Site	HTL	HTL	HTL	Y	
11e2.8	Steel Works Site	HTL	HTL	HTL	Y	Since the SMP there has been a new housing development of the former CORUS site, therefore assets at potential risk have changed (and will increase further in future). At 9.1 there is also a risk of contamination from erosion of former landfill.
11e2.9	Steel Works to The Howe	NAI	NAI	NAI	Y	
11e2.10	The Howe to Workington Harbour south breakwater	MR	MR	MR	Y	
11e2.11	Workington Harbour	HTL	HTL	HTL		
11e3.1	Workington Harbour to Siddick	HTL	MR	MR	Y	
11e3.2	Siddick to Risehow	HTL	HTL	HTL	Y	
11e3.3	Risehow to Maryport Marina	NAI	NAI	NAI		
11e3.4	Maryport Harbour / Marina	HTL	HTL	HTL		
11e4.1	Maryport Harbour to Roman Fort	HTL	HTL	HTL		
11e4.2	Roman Fort to Bank End	HTL	NAI	NAI		Here there is a vertical seawall and recurve abuts sandstone bedrock and in reasonable condition although the prom surface shows signs of cracking and slab settling which may indicate sand outwashing. Beach lowering is not an issue here as underlain by bedrock. More appropriate policy might be limited intervention.
11e4.3	Maryport Golf Course to Allonby	MR	MR	MR	Y	
11e4.4	Allonby	HTL	HTL	HTL	Y	
11e4.5	Allonby to Seacroft Farm	NAI	NAI	NAI	Y	Since the SMP, level of risk has increased, therefore SMP unit boundaries need to be reconsidered to take account of risk to road and United Utilities (UU) assets.
11e4.6	Seacroft Farm to Dubmill Point	HTL	NAI	NAI	Y	Since the SMP, feasibility studies have been considering the potential for the road to be re-routed.
11e5.1	Dubmill Point to Silloth	MR	MR	MR	Y	New defences have been constructed since the SMP, contrary to the policy of managed realignment.
11e6.1	Silloth Harbour	HTL	HTL	HTL		
11e6.2	Silloth to Skinburness (open coast)	HTL	HTL	HTL	Y	Consider unit boundary location between 11e6.2 and 11e6.3. The SMP recommended that the strategy should consider adverse impact of policy on internationally designated sites.
11e6.3	The Grune	NAI	NAI	NAI		
11e7.1	Skinburness (east)	HTL	HTL	HTL		
11e7.2	Skinburness to Wath Farm	HTL	MR	HTL		
11e7.3	Wath Farm to Saltcoates including Waver to Brownrigg	MR	MR	MR		

Policy Unit		Policy from 2010 (period in years)			Priority unit?	Review of current policies
		0-20	20-50	50-100		
11e7.4	Newton Marsh	MR	MR	MR		
11e7.5	Newton Marsh to Anthorn including Wampool to tidal limit	MR	MR	MR		
11e7.6	Anthorn	HTL	HTL	HTL		
11e7.7	Anthorn to Cardurnock	MR	MR	MR		
11e8.1	Cardurnock to Bowness-on-Solway	MR	MR	MR		
11e8.2	Bowness-on-Solway	MR	MR	MR	Y	SMP policy of Managed Realignment at 11e8.2 has been queried as defences here protect a number of properties.
11e8.3	Bowness-on-Solway to Drumburgh	MR	MR	MR		
11e8.4	Drumburgh to Dykesfield	MR	MR	MR		
11e8.5	Dykesfield to Kingmoor (Eden tidal limit)	MR	MR	MR		
11e8.6	Kingmoor to Rockcliffe	MR	MR	MR		
11e8.7	Rockcliffe	HTL	HTL	HTL	Y	At Rockcliffe, the SMP policy is currently HTL although there are no formal defences here. There are also investigations underway to consider the issues.
11e8.8	Rockcliffe to Demesne Farm	MR	MR	MR		
11e8.9	Demesne Farm to Metal Bridge (Esk)	MR	MR	MR		
11e8.10	Metal Bridge (Esk) to the River Sark	MR	MR	HTL		

Development of options

Long list of options for priority units

There is a range of potential strategy management measures that could be adopted as part of the options (packages of measures) to manage the erosion and flood risk along this frontage:

Do nothing	This means walking away from the defences, undertaking no further work, including no maintenance or repair. Where defences exist, these would deteriorate over time and fail and natural processes would be allowed to take their course. Erosion and flood risk would increase over time as defence condition worsens. At some locations, this may become the default position should funding not be available to implement the strategy. In line with FCERM-AG, Do nothing options have been retained for the short list appraisal to provide a baseline against which the benefits of other options can be compared.
Do minimum	This involves reactive repair and patch up of the existing defences, within minimum levels of investment. In line with FCERM-AG Do minimum does not include any capital works to replace time expired defences. This option will therefore not provide a long-term management solution but would extend the life of defences through maintenance and repair compared to Do nothing.

	Erosion risk (and overtopping flood risk in some locations) will increase over time as defences deteriorate. Do minimum may become the default position should funding not be available to implement the strategy. For some frontages where Do nothing is not a viable option, Do minimum has been retained for the short list appraisal.
Hold the line	There are three strategic approaches to Hold the Line: Maintain: works to maintain an existing defence in good working order or restore it to its previous condition when damaged. This would not include improvements to the defence in response to any future sea level rise, so the standard of protection could reduce over time. Measures considered include: • Reactive maintenance • Proactive maintenance • Reinforce existing defences, e.g. rock toe works, gabions Sustain: where <i>flooding</i> is the key risk, this approach includes works to retain the <u>current</u> standard of flood protection, in response to increases in risk such as due to climate change and sea level rise. Measures considered include: • Reinforce existing defences, e.g. rock toe works, gabions, adding crest walls Improve: works to provide better levels of protection, through either substantial changes to existing defences or constructing new defences. Measures considered include: • Improve existing defences, such as raising, strengthening or widening existing embankments/ seawalls • Construct new shore control structures, such as groynes (rock or timber), reefs, breakwaters (applicable to both estuary and open coasts – in estuaries, may include measures to control channel movement) • Construct new revetments or seawalls • Recharge beaches, through either nourishment or recycling, which could involve a range of different sediments • Introduce cliff slope stabilisation measures, such as rock toe works, netting, rock bolting, drainage schemes
Managed realignment	Slightly different approaches apply, depending upon whether the key risk is from erosion or flooding. For erosion risk management, measures considered include: • Construct erosion slowing defences, such as rock toe works, gabions, sand bags. • Construct defences, such as rock revetment, seawall, gabions, in a setback location – the frontages would be allowed to erode and defences implemented once erosion reaches a threshold extent. For flood risk management, measures considered include: • Construct secondary or primary setback embankments. • Remove existing defences and allow retreat to higher land.

Advance the line	There are currently no locations where the SMP recommends a policy of Advance the line, although current proposals for 11e2.1 Whitehaven Harbour and North Beach could be considered to fall under this policy option. Elsewhere Advance the line is considered an inappropriate approach to sustainable shoreline management and has not been assessed further due to the disruption to coastal processes along the frontage under such a policy and disproportionate costs.
Additional considerations	In addition to FCERM measures, option development has considered the possibility of: • Potential for habitat creation sites through regulated tidal exchange and managed realignment • Adaptive management of assets located in the flood or erosion risk zone (i.e. relocation of roads etc, removal of contamination risk)

Table 5 below indicates the long list strategy management measures identified for each **priority unit**. Also indicated is whether the key risk to the frontage is from flood (F), erosion (E) or both (F/E).

The current SMP policy is included in the table, but where this may require review, the text is shown in bold.

Defining short list options for priority units

For each priority unit, the long list of options was screened to determine which options to take forward for further appraisal. This high level screening has taken into account the current SMP policy, and any recommendations for policy review, technical feasibility, and whether costs would be prohibitive.

In line with FCERM-AG, Do nothing options (see above) have been retained for the short list appraisal to provide a baseline against which other options can be compared. For frontages where Do Nothing is not a viable option, a baseline option of Do minimum has also been retained for the short list appraisal (see Section above). This option will not provide a long-term management solution, but may become the default position should funding not be available to implement the strategy.

For each priority policy unit, the rationale for taking forward long list options for further appraisal has been clearly identified.

Table 5 Long list of options considered for each priority unit. Current SMP policy is also shown – bold text indicates where the policy is subject to review.

Policy Area	Priority Unit	Current SMP policy from 2010			Notes	Key Risk Flood/ Erosion	Do Nothing	Do Minimum	Hold the Line							Managed realignment				Other considerations		
		0-20	20-50	50-100					Maintain: Proactive Maintenance	Maintain: Reinforce existing defences	Sustain: Reinforce existing defences	Improve: Improve existing defences	Improve: Construct new shore control structures	Improve: Construct new revetments/ seawalls	Improve: Beach recharge	Improve: Cliff/ slope stabilisation measure	Construct erosion- slowing defences	Construct defences once set back	Construct secondary embankments	Remove existing defences	Potential for habitat creation sites	Adaptive management of assets
11c9 Kent Estuary	9.1 Kent Viaduct to Dick Fell Road	HTL	MR	MR	MR recommended policy, but depends upon suitability, otherwise may need to continue to HTL	F	✓	✓	✓	✓		✓		✓				✓	✓	✓	✓	
	9.2 Sandside	HTL	HTL	HTL	Possibility of realigning road and constructing setback defences to be considered.	F/E	✓	✓	✓	✓		✓		✓				✓				
	9.3 Hollins Well Road north to Levens Bridge	HTL	MR	MR	MR recommended policy, but depends upon suitability, otherwise may need to continue to HTL	F	✓	✓	✓	✓		✓		✓				✓	✓		✓	
11c10: Humphrey Head to Cark	10.2 Humphrey Head to Cowpren Point	HTL	MR (+HTL)	MR	Impact of private defences at Bourne Leisure site to be considered, as well as MR options	F/E	✓	✓	✓	✓							✓		✓			
11c11 Outer Leven Estuary	11.4 Glaxo Factory Site (south)	NAI	NAI	NAI	Highlighted as a possible development site - so measures to hold the line to be considered.	F/E	✓	✓				✓		✓			✓		✓			
11c12: Leven Estuary	12.3 Barrow End Rocks (A590) to Leven Viaduct	HTL	MR	NAI	Boundary of 11c11/12 to be reconsidered – thereby extending HTL into part of this unit	F/E	✓	✓	✓	✓	✓	✓		✓					✓	✓	✓	✓
11c13: Bardsea to Piel Island	13.2 Newbiggin to Rampside	HTL	MR	HTL	Options for maintaining road access along frontage to be considered	F/E	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓
	13.3 Rampside	NAI	HTL	HTL	Options for medium and long term management of flood risk	F/E	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓		✓
	13.4 Roa Island	HTL	HTL	HTL	Options for HTL that minimise impact on international habitat to be considered	F/E	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓		
11c16: Duddon Estuary	16.3 Askam to Dunnerholme	NAI	NAI	NAI	Options for protecting the railway line considered	F	✓	✓				✓	✓	✓								✓
	16.4 Dunnerholme to Sand Side	HTL	HTL	HTL	Options for minimising risk to the railway, which is also a flood defence, to be considered.	F/E	✓	✓				✓	✓	✓								✓
	16.5 Kirkby-in-Furness	HTL	HTL	HTL	Options for minimising risk to the railway, which is also a flood	F/E	✓	✓	✓	✓		✓		✓								✓

Policy Area	Priority Unit	Current SMP policy from 2010			Notes	Key Risk Flood/ Erosion	Do Nothing	Do Minimum	Hold the Line							Managed realignment				Other considerations	
		0-20	20-50	50-100					Maintain: Proactive Maintenance	Maintain: Reinforce existing defences	Sustain: Reinforce existing defences	Improve: Improve existing defences	Improve: Construct new shore control structures	Improve: Construct new revetments/ seawalls	Improve: Beach recharge	Improve: Cliff/ slope stabilisation measure	Construct erosion- slowing defences	Construct defences once set back	Construct secondary embankments	Remove existing defences	Potential for habitat creation sites
					defence, to be considered.																
	16.10 Millom Mine Works	NAI	NAI	NAI	SMP policy questioned due to flood risk to Millom. May therefore consider measures to HTL. Identified as a potential wildlife compensation site for Moorside.	F/E	✓	✓						✓							
	16.11 Hodbarrow Mains	NAI	MR	HTL	Options to reduce flood risk to Millom considered – link with options for d1.1.	F	✓	✓					✓	✓				✓			
11d1: Hodbarrow Point to Selker	1.1 Hodbarrow Point to Haverigg	HTL	MR	HTL	SMP policy questioned given the current defences and limited habitat gains, so options to HTL also considered.	F	✓	✓	✓	✓								✓			
11d2: Selker to Eskmeals	2.2 Stubb Place and Eskmeals Dunes	MR	MR	MR	Options to maintain road access to MOD Eskmeals site – may involve change in policy to HTL.	E	✓	✓				✓	✓	✓	✓		✓	✓			
11d5: Seascale to St Bees	5.1 Seascale	HTL	HTL	HTL	Options to continue to HTL.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓					
	5.2 Seascale to Sellafield	NAI	NAI	NAI	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓					
	5.3 Sellafield	HTL	HTL	HTL	Options to continue to HTL. Change in boundary to be considered.	F/E	✓	✓	✓	✓	✓	✓	✓	✓							
	5.4 Sellafield to Braystones	NAI	NAI	NAI	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓					
	5.5 Braystones, Nethertown, Coulderton	MR	NAI	NAI	Options for minimising risk to the railway to be considered. Also consider measures for beach properties.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓					✓
	5.6 Coulderton to Seamill	NAI	NAI	NAI	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓					
	5.7 Seamill to Pow Beck	HTL	HTL	HTL	Options to continue to HTL.	E	✓	✓	✓	✓		✓		✓							✓
11d6: St Bees	6.2 St Bees Promenade	HTL	HTL	MR	Options to continue to HTL, plus consider possibilities for MR in long term.	E	✓	✓	✓	✓		✓	✓	✓	✓		✓				✓

Policy Area	Priority Unit	Current SMP policy from 2010			Notes	Key Risk _Flood/ _Erosion	Do Nothing	Do Minimum	Hold the Line							Managed realignment				Other considerations		
		0-20	20-50	50-100					Maintain: Proactive Maintenance	Maintain: Reinforce existing defences	Sustain: Reinforce existing defences	Improve: Improve existing defences	Improve: Construct new shore control structures	Improve: Construct new revetments/ seawalls	Improve: Beach recharge	Improve: Cliff/ slope stabilisation measure	Construct erosion- slowing defences	Construct defences once set back	Construct secondary embankments	Remove existing defences	Potential for habitat creation sites	Adaptive management of assets
11e1: St Bees Head to Whitehaven	1.4 Whitehaven South Beach	NAI	NAI	NAI	Consider measures to address risks to harbour due to more rapid erosion.	E	✓	✓	✓	✓			✓	✓	✓		✓					
11e2: Whitehaven to Workington	2.2 Bransty to Parton	HTL	HTL	HTL	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓		✓					
	2.3 Parton	HTL	HTL	HTL	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓		✓					
	2.4 Parton to Harrington Parks	HTL	HTL	HTL	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
	2.5 Harrington Parks to Harrington Harbour	HTL	NAI	NAI	Possible contamination risk and impact on 11e2.6 - therefore HTL may be option beyond short term.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
	2.7 Harrington to Steel Works	HTL	HTL	HTL	Options for minimising risk to the railway to be considered.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
	2.8 Steel Works Site	HTL	HTL	HTL	Options to minimise risk to new development of site.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
	2.9 Steel Works to The Howe	NAI	NAI	NAI	Policy questioned due to contamination risk. Options may consider measures for HTL.	E	✓	✓					✓	✓	✓	✓	✓					
	2.10 The Howe to Workington	MR	MR	MR	Options for managing natural retreat of coast – needs to be in line with options for 2.9.	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
11e3: Workington to Maryport	3.1 Workington Harbour to Siddick	HTL	MR	MR	Options needs to consider HTL at 2.11 and flood risk to harbour. Options to continue to minimise risk to railway and windfarm (whilst it remains)	F/E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
	3.2 Siddick to Risehow	HTL	HTL	HTL	Options for minimising risk to the railway to be considered.	F/E	✓	✓	✓	✓		✓	✓	✓	✓							
11e4: Maryport to Dubmill Point	4.3 Golf Course to Allonby	MR	MR	MR	Options for minimising risk to golf course.	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	4.4 Allonby	HTL	HTL	HTL	Currently no defences present, but consider longer term options to continue to protect village.	F/E	✓	✓					✓	✓	✓	✓	✓	✓				
	4.5 Allonby to Seacroft Farm	NAI	NAI	NAI	Consider options for maintaining road access along frontage to be considered	F/E	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓					

Policy Area	Priority Unit	Current SMP policy from 2010			Notes	Key Risk Flood/ Erosion	Do Nothing	Do Minimum	Hold the Line							Managed realignment				Other considerations		
		0-20	20-50	50-100					Maintain: Proactive Maintenance	Maintain: Reinforce existing defences	Sustain: Reinforce existing defences	Improve: Improve existing defences	Improve: Construct new shore control structures	Improve: Construct new revetments/ seawalls	Improve: Beach recharge	Improve: Cliff/ slope stabilisation measure	Construct erosion- slowing defences	Construct defences once set back	Construct secondary embankments	Remove existing defences	Potential for habitat creation sites	Adaptive management of assets
					(includes possible rerouting) in conjunction with adjacent units.																	
	4.6 Seacroft Farm to Dubmill	HTL	NAI	NAI	Options for maintaining road access along frontage to be considered (includes possible rerouting).	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
11e5: Dubmill to Silloth	5.1 Dubmill Point to Silloth	MR	MR	MR	Options for maintaining road access along frontage to be considered (includes possible rerouting).	E	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					✓
11e6: Silloth to The Grune	6.2 Silloth to Skinburness	HTL	HTL	HTL	Options to continue to HTL.	E	✓	✓	✓	✓	✓	✓	✓	✓								
11e8 Cardurnock to Scottish Border	8.2 Bowness on Solway	MR	MR	MR	SMP policy queried as defences protect a number of properties. Options to HTL also to be considered.	E	✓	✓	✓	✓		✓	✓	✓			✓	✓				
	8.7 Rockcliffe	HTL	HTL	HTL	SMP policy queried as no defences currently present.	F/E	✓	✓						✓					✓			✓

Appraisal and comparison of options for priority units

Each short-listed option taken forward has been appraised in terms of evaluating technical, social, economic and environmental factors.

The technical appraisal of options has been based on understanding of the coastal environment and shoreline behaviour, current defence condition and appraisal of the engineering feasibility of the option.

A SEA has been undertaken alongside the technical and cost appraisal in accordance with EC Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive). The environmental appraisal has drawn upon baseline environmental data for the Strategy area as documented in the SEA Environmental Report, which identifies economic, environmental and social assets, in addition to any key issues and opportunities for enhancement that could be implemented as part of the Strategy. Within the SEA, strategy-specific environmental objectives have been defined to address the key environmental issues with potential to influence the decision-making process and to be in accordance with the Shoreline Management Plan and local planning policies. Each short-listed strategy option has been subject to comparative appraisal against these objectives.

The economic feasibility of implementing a particular option has also been determined, taking into account the likely timing of capital works (where applicable) and lifespan of the proposed option. In order to assess this, the packages of measures required to implement the strategic options have been costed and the benefits of the strategic options identified and evaluated. The No Active Intervention option provides the baseline for the economic appraisal. Further information is provided in the Economic Assessment Report.

The short-listed options were presented to the public during a 2-month public consultation between November and December 2018. Feedback collected during this public consultation period was used to refine the options and inform the preferred Strategy.

Identifying preferred approaches

The identification of a preferred strategic approach or approaches in each of the Policy Unit frontages has taken into account the appraisal of short-listed options and feedback from the options stage public engagement. Further engagement on the draft preferred strategy for each area was undertaken in November – December 2019 and final changes to the reports have taken responses received into account.

Economic assessment has indicated that in some locations it is unlikely that the work identified by this Strategy will attract large amounts of central Government Flood Defence Grant in Aid (FDGiA) funding. Implementation of future options will therefore depend upon partnership working to identify alternative sources of funds, some of which will be required in the near term and some not required until later in the Strategy timeframe.

As a consequence of this and the need for further investigations to support future management decisions, a number of follow-on activities will be needed over the next 10 or so years. These have been identified for each frontage and range from implementing schemes to monitoring and planning.

4 Strategic Plan (summary)

This section presents a summary of the coastal defence management strategy and defines the recommended actions to implement the preferred approach. The strategy (and supporting reports) is intended to be the main reference for Cumbria County Council, the Environment Agency, local authorities and partnership organisations in defining future management requirements and activities and for exploring future funding resources.

Full details of the option development and appraisal are provided in a series of technical appraisal reports for each of the 24 policy areas, which set out the following:

Introduction	Location and site description	Defines policy units and priority units, key responsibilities, and a site overview
	Current SMP policy	Taken directly from the SMP
	Estuary managed realignment (if appropriate)	For estuary policy areas, identifies key issues and opportunities and further studies required
Appraisal of priority units	Existing approach to flood and coastal erosion risk management	Highlights justification for SMP policy, defines current defence and condition, summarises recent shoreline change
	Outline of problem	Overview of background, identification of issues constraints and opportunities, defines strategy considerations and general approach
	Appraisal of short listed options	Summarises the rationale for taking long options to the short list stage
	Options development and appraisal	Summarises long list options for each policy unit
	Discussion	Technical, environmental and economic appraisal
	Strategic way forward	Discussion of appraisal outcome Preferred strategic approach and future activities required to implement the Strategy.
Appraisal of non-priority units	Existing approach	Identifies the existing approach to flood and coastal erosion risk management
	Strategy considerations	Identifies key strategy considerations
	Discussion	Discussion of issues and approaches
	Strategic way forward	Preferred strategic approach and future activities required to implement the Strategy.

Summary statements have been produced for each SMP policy area: the list below provides links to these. The locations of the policy units are shown on the maps which follow.

A separate Action Plan has been produced, which sets out all of the proposed activities identified in the detailed technical appraisals. The recommended activities are subject to funding and resources being available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c8 Heald Brow to Humphrey Head	38
11c9 Kent Estuary	39
11c10 Humphrey Head to Cark	41
11c11 Outer Leven Estuary	42
11c12 Leven Estuary	44
11c13 Bardsea to Piel Island	46
11c14 Walney Island	47
11c15 Walney Channel (mainland)	49
11c16 Duddon Estuary	50
11d1 Summary of proposed strategy: 11d1	52
11d2 Selker to Eskmeals	53
11d3 Ravenglass Estuary Complex	54
11d4 Drigg Point to Seascale	55
11d5 Seascale to St Bees	56
11d6 St Bees	58
11d7 St Bees Head	59
11e1 St Bees Head to Whitehaven	60
11e2 Whitehaven to Workington	61
11e3 Workington to Maryport	63
11e4 Maryport to Dubmill Point	64
11e5 Dubmill Point to Silloth	66
11e6 Silloth to The Grune	67
11e7 Moricambe Bay	68
11e8 Cardurnock to Scottish Border	70

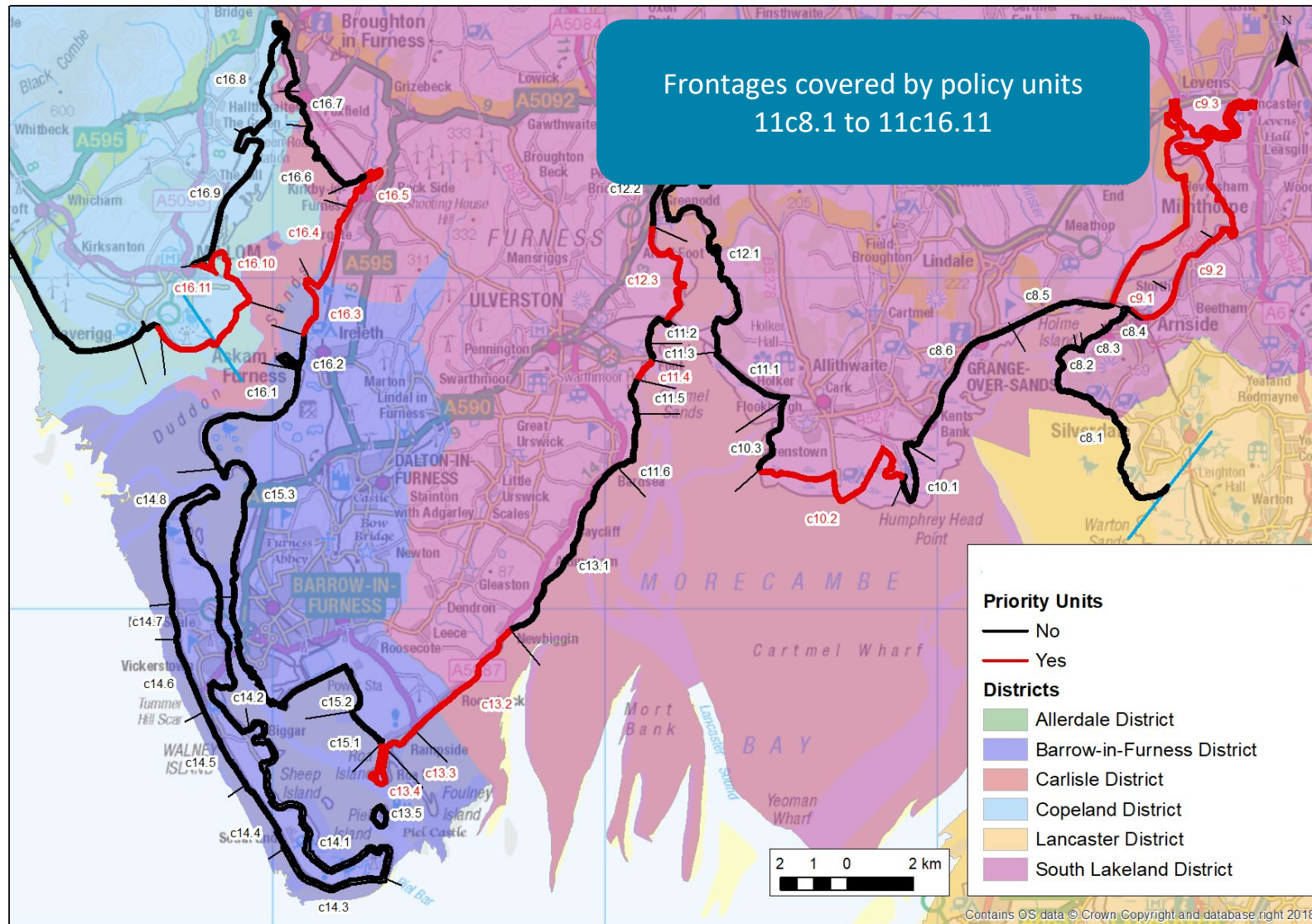


Figure 6 Cumbria districts and policy unit overview map – sub-cell 11c.

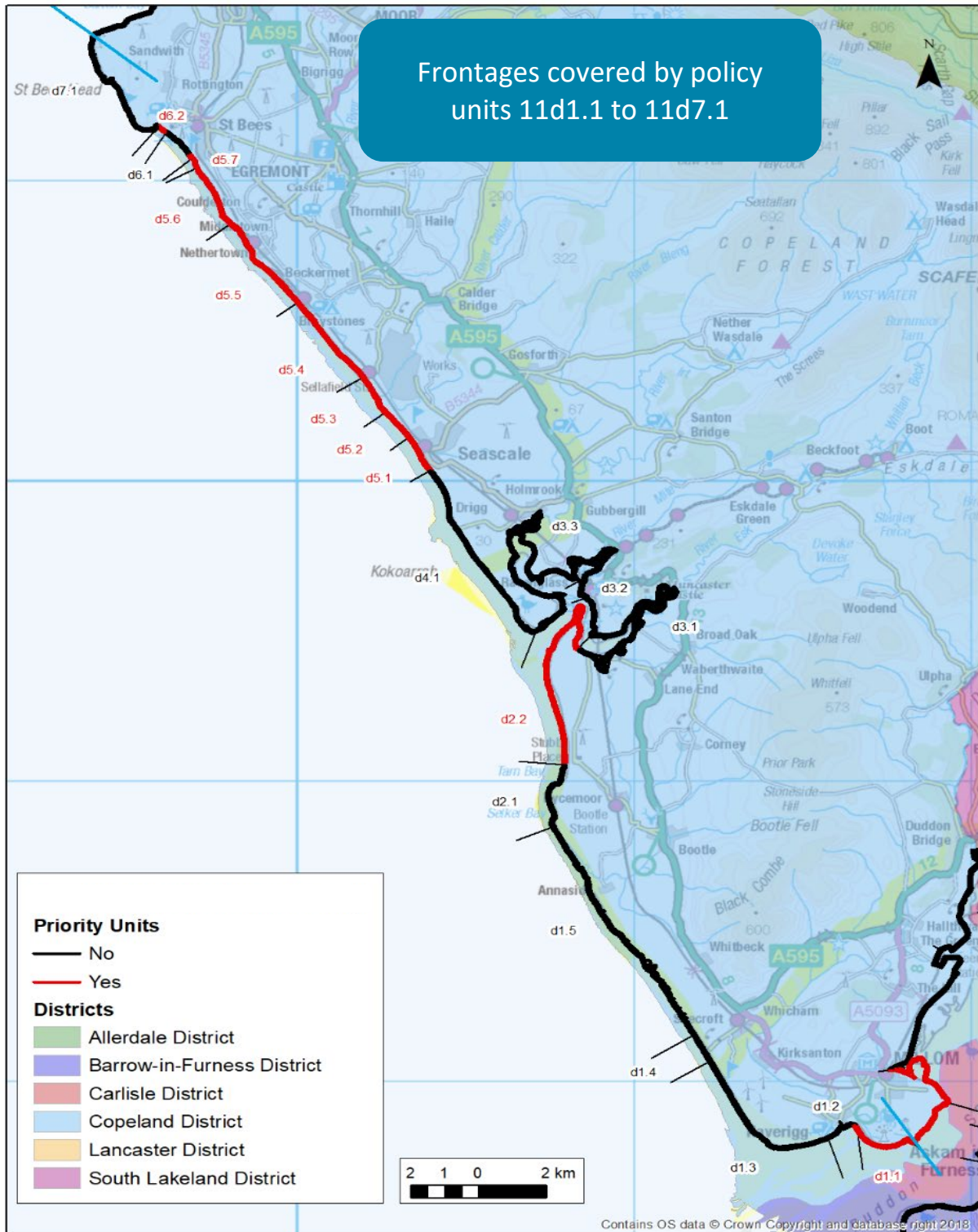


Figure 7 Cumbria districts and policy unit overview map – sub-cell 11d

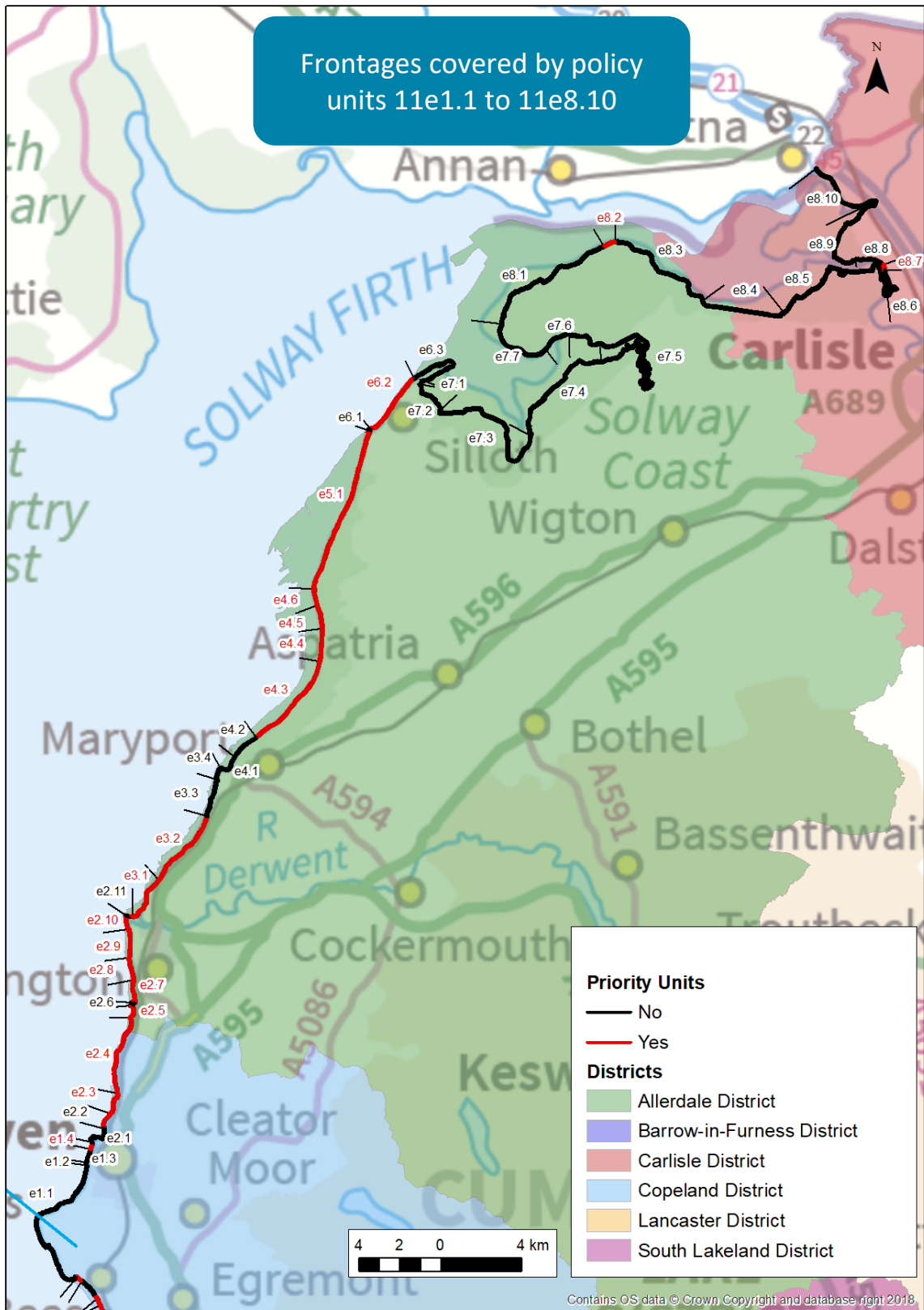


Figure 8 Cumbria districts and policy unit overview map – sub-cell 11e

11c8 Heald Brow to Humphrey Head

Preferred strategic approach: Environmental enhancement – allow the area to function as naturally as possible and look for environmental opportunities within the estuary, whilst maintaining protection to core communities and infrastructure.

		Next 10 years	Beyond 10 years
11c8.1	Heald Brow to Frith Wood	Allow area to function as naturally as possible, through implementing no active intervention (no new defences).	
11c8.2	New Barns	Allow area to function as naturally as possible, through implementing no active intervention (no new defences). Possible need to manage coastal risk to access track, subject to necessary consents.	
11c11.3	Grubbins Wood	Allow area to function as naturally as possible, through implementing no active intervention (no new defences).	
11c8.4	Ash Meadow to the Kent viaduct (Arnside)	Maintain existing structures to address the flood and erosion risks to the community and property in Arnside.	Capital works (e.g. new revetment or wall) may be required as defences reach end of life or if major changes in saltmarsh extent occur. Future appraisal of options will be required.
11c8.5	Kent viaduct to Holme Island	Maintain existing structures to address the flood and erosion risks to the railway line and shoreline assets. Consider local environmental opportunities to enhance site.	Capital works (e.g. new revetment or wall) may be required as defences reach end of life or if major changes in saltmarsh extent occur. Future appraisal of options will be required.
11c8.6	Holme Island to Humphrey Head (Grange-over-Sands)	Maintain existing structures to address the flood and erosion risks to the community and property in Grange-over-Sands.	Capital works (e.g. new revetment or wall) may be required as defences reach end of life or if major changes in saltmarsh extent occur. Future appraisal of options will be required.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh and intertidal change



- Patch and repair degradation/damage of defence assets if required



- Management plans to indicate the need for advance planning of works (and funding sources)
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats



- Local inspections and silt management where justified at a number of locations for both inner and outer Kent to address fluvial flooding caused by tidal locking and blockage from saltmarsh accretion.

Further details on actions and responsibilities are provided in the **Action Plan**.

11c9 Kent Estuary

Preferred strategic approach: Maintain existing defences in short term – continue to manage risks to hinterland assets and communities, whilst seeking an alternative long term estuary-wide solution that can both continue to minimise risks (although not necessary along existing defence alignments) and deliver environmental benefits.

		Next 10 years	Beyond 10 years
11c9.1	Kent viaduct to Dick Fell Road (Sandside)	Hold the line through proactive maintenance of the existing defence, whilst additional investigations are undertaken.	Long term approach will depend upon outcome of studies and availability of funding. Hold the line through improving existing flood defences, in combination with an Regulated Tidal Exchange scheme is current preferred approach.
11c9.2	Sandside (Dick Fell Road to Hollins Well Road)	Hold the line through proactive maintenance of the existing defence, whilst additional investigations are undertaken.	Long term approach will depend upon outcome of studies and availability of funding and more detailed economic assessment. Hold the line through improving or replacing existing defences, dependent on funding and satisfying further habitat assessments.
11c9.3.1	Hollins Well Road north to Levens Bridge (east bank)	Hold the line through proactive maintenance of the existing defence, whilst additional investigations are undertaken.	Long term approach will depend upon outcome of studies and availability of funding. Hold the line through improving existing flood defences, in combination with habitat creation schemes is current preferred approach.
11c9.3.2	Levens Bridge (east bank) & Levens Bridge to Kent viaduct (west bank)	Hold the line through proactive maintenance of the existing defence, whilst additional investigations are undertaken.	Long term approach will depend upon outcome of studies and availability of funding. Hold the line through improving existing flood defences, in combination with habitat creation schemes is current preferred approach.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh and intertidal change



- Patch and repair any degradation/damage of defence assets if required.



- Management plan to indicate the need for advance planning of works (and funding sources)
- Additional studies to explore the potential for habitat creation and impact of realigning or abandoning sections of defences.
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats



- Review opportunities to reduce flood risk as part of the future highways scheme near Gilpin Bridge (11c9.3.2)

	Local inspections and silt management where justified at a number of locations for both inner and outer Kent to address fluvial flooding caused by tidal locking and blockage from saltmarsh accretion.
	- Engagement with local land owners and community - Engagement with Natural England and AONB partnership
	Investigate potential funding sources for longer term works
	Consider potential for individual property resilience

Further details on actions and responsibilities are provided in the **Action Plan**.

11c10 Humphrey Head to Cark

Preferred strategic approach: Environmental enhancement – allow the area to function as naturally as possible and look for environmental opportunities within the estuary, whilst maintaining protection to core communities and infrastructure.

		Next 10 years	Beyond 10 years
11c10.1	Humphrey Head	Allow area to function as naturally as possible, through implementing no active intervention (no new defences).	
11c10.2	Humphrey Head to Cowpren Point	Continue to reduce flood risk to hinterland assets in the short and medium term, whilst opportunities for longer term realignment are explored, recognising the potential saline lagoon scheme to the west of Lakeland Leisure Park.	
11c10.3	Cowpren Point to Cark	Allow area to function as naturally as possible, through implementing no active intervention (no new defences).	

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh, intertidal change and channel movement
- Monitoring of highway condition and safe operation



- Patch and repair degradation/damage of defence assets if required



- Management plan to indicate the need for advance planning of works (and funding sources)
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats
- Further studies to fully understand the impacts of realigning or abandoning sections of defences



- Implementation (and monitoring) of recently consented scheme to create an area of coastal saline lagoon habitat

Further details on actions and responsibilities are provided in the **Action Plan**.

11c11 Outer Leven Estuary

Preferred strategic approach: Limited intervention – manage risks to the railway, industrial sites, infrastructure and properties where economically justifiable and affordable, whilst generally allowing the majority of the shoreline to continue to behave naturally and respond to coastal change.

		Next 10 years	Beyond 10 years
11c11.1	Cark to Leven viaduct	Continue to minimise risk of erosion and flooding to railway and viaduct approaches through maintaining existing defences.	Continue to manage risk of coastal erosion and flooding to railway line, with works undertaken to reduce risk when required. Also seek opportunities for habitat improvement, such as a regulated tidal exchange scheme.
11c11.2	Leven viaduct to Canal Foot cottages	Allow area to function as naturally as possible whilst recognising the need for further investigations into possible contamination risk due to erosion or flooding of landfill sites. Maintain defences to railway viaduct approaches and allow maintenance of existing private defences within existing footprints.	
11c11.3	Canal Foot	Hold the line through proactive maintenance of existing defences to consistently manage flood risk to south Ulverston.	Continue to manage risk of coastal flooding and erosion to community and amenities by upgrading existing defences, recognising potential flood risk links to wider South Ulverston area.
11c11.4	GSK Factory Site (south)	Implement No Active Intervention (no new defences) but continue to monitor risk of coastal flooding: investigate potential for future set back defences.	Continue to monitor risk of coastal flooding recognising potential flood risk links to wider South Ulverston area and possible future requirements for set-back defences.
11c11.5	Sandhall to Conishead Priory	Investigate need for future set-back defences to wider south Ulverston flood cell in medium or long term. Allow for maintenance of existing private defences.	Continue to manage risk to hinterland assets from coastal erosion and flooding, although this may not be along existing defence alignments, recognising potential flood risk links to wider South Ulverston area.
11c11.6	Conishead Priory to Bardsea	Allow area to function as naturally as possible, whilst recognising the need for localised defence measures to protect coastal roads and properties at Wadhead Hill.	

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh and intertidal change



- Patch and repair degradation/damage of defence assets where required



- Management plans to indicate the need for advance planning of works (and funding sources)
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats (with other Morecambe Bay policy areas)

	- Contamination risk assessments for historical landfills at erosion risk in 11c11.2 and 11c11.4 - Complete strategic studies of combined flood risk for south Ulverston
	Initial assessment of local or property level resilience options for managing flood risk to the factory and highway near Wadhead Hill
	EA to complete ongoing studies 'South Ulverston Integrated Flood Risk Management Scheme' including considering need for future tidal flood risk reduction measures and plan future scheme development

Further details on actions and responsibilities are provided in the **Action Plan**.

11c12 Leven Estuary

Preferred strategic approach: The long term vision is to move towards a more naturally functioning estuary. In the short term this would involve reactive maintenance of defences, whilst taking opportunities to realign or remove defences to enable small to medium scale habitats creation through managed realignment while managing risks to properties and infrastructure and the designated sites.

		Next 10 years	Beyond 10 years
11c12.1	Leven viaduct to Haverthwaite (left bank) and	Take opportunities to realign or remove defences to enable small to medium scale estuarine habitat creation through managed realignment with further investigations regarding need for adaptation to manage wider risks.	Subject to short term investigations allow area to function as naturally possible.
11c12.1	Haverthwaite to Greenodd (right bank)	Allow area to function as naturally as possible, whilst recognising the need for short term management to allow time for adaptation/ further investigations.	Possible SMP boundary position change depending on improvement scheme for A590, Greenodd to Russland Pool.
11c12.2	Greenodd to Barrow End Rocks (A590)	Monitor risk of erosion to A590, implementing scheme to improve defences when necessary, considering opportunities for habitat creation through managed realignment in the adjacent units 12.1 or 12.3.1 to provide replacement habitat and suitable set back flood risk management for the A590.	Hold the line through proactive maintenance of defences.
11c12.3.1	Old Railway Embankment	Consider SMP policy change to introduce new unit. Maintain defences while considering options for managed realignment and habitat creation or improving defences.	Hold the line to manage flood risk to A590 and Ulverston through proactive maintenance of defences either on current alignment or set back with habitat creation.
11c12.3	Barrow End Rocks (A590) to Leven viaduct	Allow area to function as naturally as possible and look for environmental opportunities to enhance site with further investigations regarding need for adaptation to manage wider risks.	Subject to short term investigations allow area to function as naturally possible.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh and intertidal change
- Monitoring to inform modelling of estuarine processes



- Patch and repair degradation/damage of defence assets if required.
- Subject to consents implement short term improvement scheme to defences at Greenodd when necessary.



- Consider undertaking SMP change process to establish new policy unit 11c12.3.1 and redefining policy unit boundaries (11c12.1 and 11c12.2)
- Additional studies to explore the potential for habitat creation and impact of realigning or abandoning sections of defences in 11c12.1 and 11c12.3 on tidal prism and erosion risks to Leven viaduct, the A590 and the wider geomorphology.
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats.



- Continue to develop scheme proposed to protect A590 from channel erosion risk.
- Scheme appraisal for old railway embankment in new unit 11c12.3.1



- Liaison between stakeholders regarding potential changes to defence management related to future plans for the A590.
- Engagement with local land owners and the community on future management of private defences.

Further details on actions and responsibilities are provided in the **Action Plan**.

11c13 Bardsea to Piel Island

Preferred strategic approach: Environmental enhancement – allow the northern part of the frontage to function as naturally as possible along, with local measures to reduce erosion risk to roads and property, but maintain existing defences to the A5087 along the southern frontage, recognising this as a more cost effective approach to managing this critical infrastructure.

		Next 10 years	Beyond 10 years
11c13.1	Bardsea to Newbiggin	Allow area to function as naturally as possible, but with maintenance of localised defences to protect infrastructure and properties.	
11c13.2	Newbiggin to Rampside	Maintain defences to A5087 coast road. Repair damage to poor condition defences as required.	Maintain and upgrade defences to A5087 strategic transport link and hinterland assets, including coastal communities.
11c13.3	Rampside	Monitor saltmarsh and deterioration of Foulney Embankment, with minor works undertaken to retain existing defences as required.	Continue to monitor risk of flooding and erosion to Rampside, consider need for works to upgrade existing defences should risks increase.
11c13.4	Roa Island	Maintain and repair existing defences to causeway and Roa Island, whilst longer term solutions are sought.	Maintain defences on the island and causeway. Review need to refurbish Foulney Embankment.
11c13.5	Piel Island	Allow area to function as naturally as possible, whilst allowing for local defences to protect shoreline assets such as Piel Castle to be maintained.	

Key actions and activities (next 10 years):



- Monitor condition of defences.
- Monitor marsh and intertidal change.
- Monitoring of risk to historical assets at Moat Farm Castle and Piel Castle Scheduled monuments.



- Proactive maintenance and repairs to degradation/damage to defence assets if required.



- Studies and landowner consultation for habitat creation needed to mitigate habitat loss in defence footprints as part of strategic habitat compensation plan
- Further studies required to confirm long-term approach to management of Foulney Embankment, after 5-years monitoring.



- Review risks of ongoing erosion on the Scheduled Monument at Moat Farm and consider the need for erosion slowing temporary defences and recording and investigations before loss.



- Seek funding for scheme to open up the Ladycroft cottage culvert to reduce flood risk to the A5087.



- Liaison between stakeholders regarding needs for local defence management.
- Identification of works required for poor condition defences to A5087.

Further details on actions and responsibilities are provided in the **Action Plan**.

11c14 Walney Island

Preferred strategic approach: Environmental enhancement – allow the area to function as naturally as possible supporting the environmental designations while maintaining defences to key assets, core communities and infrastructure and improving resilience to flood and coastal risks.

		Next 10 years	Beyond 10 years
(11c14.8)	1 North Walney from north of West Shore Park to Lenny Hill (both coasts)	No active intervention. Monitor coastal change. Review erosion risk to historical landfill site and need for management of contamination risk.	No active intervention - allow area to function as naturally as possible
(11c14.7 part)	2 West Shore Park	Maintain the new defences whilst planning for relocation of the site.	Undertaken a review of coastal defences for the whole of 11c14.7 (Units 2 and 3) before the temporary defences as West Shore Park are removed in 20 years after relocation of assets at risk.
(11c14.7 part)	3 Earnse Point to Walk Haw Scar	Maintain existing defences, subject to private funding.	
(11c14.6)	4 Walk Haw Scar to Nanny Point Scar	No active intervention. Monitor coastal change. Allow area to function as naturally as possible	
11c14.5, 11c14.2 (part), 11c14.1 (part)	5 Nanny Point Scar to Hillock Whins (unit 5) and Biggar to Tummer Hill (unit 8)	Do minimum, with reactive maintenance and repair to defences.	Do minimum to continue to maintain defences whilst feasible and affordable. Plan for potential future relocation of the landfill site.
11c14.4	6 Hillock Whins to Hare Hill	Maintain and repair defences. Complete ongoing studies to determine a long term solution to the erosion risk to the landfill site.	Do minimum – maintain and reactively repair rock armour defences.
11c14.3 and 11c14.1 (part)	7 South Walney	Do nothing and allow area to function as naturally as possible. Consider needs for more resilient resident access.	
11c14.2 (part)	8 Vickerstown and North Scale	Maintain and repair defences to implement the SMP preferred policy of Hold the line.	Maintain and repair defences to implement the SMP preferred policy of Hold the line. Consider future defence or road raising to provide more flood resilient access.

Key actions and activities (next 10 years):



- Monitoring asset condition, foreshore levels and shoreline change.



- Maintain existing defences where required and subject to funding.
- Patch and repair degradation/damage of defence assets if required



- Consider need for promotion of property level resilience with increasing future flood risk.
- Safe siting of and monitoring of risks to the coastal paths.
- Liaison with CWT, local businesses and residents regarding tidal resilience for private road to South Walney reserve.



- Consideration of potential funding streams to support continued maintenance or future raising of the existing defences at the Promenade.
- Consideration of potential funding streams to support continued maintenance of the existing defences at Earnse for up to 20 years, in line with plans for West Shore Park.



- Management plans to indicate the need for advance planning of works (and funding sources)
- Estuary-wide scale geomorphological study looking at current and potential future gains and losses in marsh and flats



- Management of vehicle access to foreshore to avoid damage to natural beach ridge increasing flood risk and impacting designated sites.



- Liaison between local residents and local business to ensure safe access to properties.
- Liaison between West Shore Park owners and Barrow Council to relocate the park within 20 years

Further details on actions and responsibilities are provided in the **Action Plan**.

11c15 Walney Channel (mainland)

Preferred strategic approach: Allow undeveloped coast to function as naturally as possible, whilst continuing to manage flood and erosion risks to property, industry and infrastructure in Barrow-in-Furness.

		Next 10 years	Beyond 10 years
11c15.1	Rampside to Westfield Point	Allow area to function naturally, through implementing no active intervention (no new defences).	
11c15.2	Westfield Point to Hindpool (Barrow in Furness)	Hold the line through proactive maintenance of the existing defence, subject to private management along some frontages.	Hold the line through proactive maintenance of the existing defence, subject to private management along some frontages.
11c15.3	Hindpool to Lowsy Point	Allow area to function as naturally as possible, whilst recognising the risk to local properties at Lowsy Point and potential contamination risk.	Allow area to function as naturally as possible. Should erosion accelerate in the area, works may be required to address possible contamination risk from former cellophane factory.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor coastal change, including along the face of the slag bank within 11c15.3.



- Patch and repair any degradation or damage of defence assets if required.
- Investigate ownership and purpose of short length of defence near Sowerby Wood between Hindpool and Lowsy Point



- Study to assess the risk of contamination due to erosion of the old cellophane factory and associated waste tip



- Liaison between stakeholders to develop regeneration plans and funding opportunities for the Barrow-in-Furness frontage
- Continued discussion between stakeholders regarding future coastal risk management at Lowsy Point

Further details on actions and responsibilities are provided in the **Action Plan**.

11c16 Duddon Estuary

Preferred strategic approach: Manage flood and erosion risks to the railway, other infrastructure and properties where economically and environmentally viable while allowing for realignment or withdrawal from defences along other frontages.

		Next 10 years	Beyond 10 years
11c16.1	Lowsey Point to Askam Pier	No active intervention: Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	
11c16.2	Askam-in-Furness	Hold the line by maintaining existing defences and monitoring shoreline change. Review importance of Askam Pier to management of risk of coastal flooding and erosion to Askam-in-Furness.	
11c16.3	Askam to Dunnerholme	Allow do minimum maintenance of private defences to allow time for adaption and roll-back of shoreline assets. Review need for defence improvements at railway.	Allow area to function as naturally as possible and look for environmental opportunities to enhance site. Review need for defences to the railway line.
11c16.4	Dunnerholme to Sand Side	Hold the line policy by repairing or reinforcing erosion protection to the railway embankment.	Continue to reduce risk of coastal erosion and flooding to railway line and shoreline assets through a proactive strategic approach
11c16.5	Kirkby-in-Furness	Hold the Line by improving existing defences to the railway line. Review tidal flood risk to properties and viability of joint scheme with Network Rail.	Continue to reduce risk of coastal erosion and flooding to railway line and communities of Sand Side and Kirkby-in-Furness through a proactive strategic approach
11c16.6	Herdhouse Moss	Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	Review tidal flood risk to railway and isolated properties and review need for localised or set-back defences.
11c16.7	Galloper Pool to viaduct	Hold the line by undertaking repairs and maintenance to the existing defences.	Continue manage risk of coastal erosion and flooding to railway line and community of Foxfield through a proactive strategic approach.
11c16.8	Duddon Estuary (inner)	Hold the line by Reactive patch and repair (Do Minimum) whilst undertaking further investigations on future approach.	Allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst recognising need to continue to reduce risk of flooding to the A595, essential utilities and railway viaduct.
11c16.9	Millom Marshes	Hold the line by Reactive patch and repair (Do Minimum) whilst undertaking further investigations on future approach.	Allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst recognising need to continue to reduce risk to railway line.
11c16.10.1	Millom (old railway embankment)	SMP change process to define new policy unit and formalise the frontage as a 3rd party defence. Study to review flood risk from all sources in Millom and Haverigg.	Manage risk of coastal flooding to South Millom flood area. Potential raising of low spots in existing embankment and road crossing once formalised as a coastal defence if justified.

11c16.10	Red Hills - Millom Iron Works (industrial area)	No active intervention – monitor levels of risk from erosion and flooding and from flooding of potentially contaminated land.	Allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst recognising need to continue to reduce risk to wider flood area of South Millom.
11c16.11	Hodbarrow Mains	No active intervention – undertake South Millom coastal flood risk study.	Allow area to function as naturally as possible. Subject to short term studies possible long term need for set back embankment to reduce risk to wider flood area of South Millom.

Key actions and activities (next 10 years):



- Monitoring asset condition, foreshore levels, marsh extent and shoreline change.
- Estuary wide monitoring and surveys to inform modelling include bathymetric surveys, LiDAR and aerial photography for saltmarsh and channel position monitoring.



- Maintain existing defences where required and subject to funding.



- Estuary wide study including geomorphological modelling and consultation to investigate managed realignment viability and associated effects on the Duddon Estuary, to inform policy delivery and develop a long term strategy, including a Habitat Regulations Assessment. Confirm preferred technical approach, extents of Managed realignments and potential for habitat gains and losses.
- Study including modelling to understand the importance of Askam Pier in protecting Askam-in-Furness from increased flood risk.
- Millom and Haverigg flood risk study to review all sources of flood and erosion risk to Millom and Haverigg, consider standard of protection provided by existing embankments and establish monitoring of saltmarsh change to determine if/when works will be needed to increase standard of protection.
- Studies to better understand levels of risk to the railway and operations (various locations).



- Contamination risk assessments for 11c16.1 and 11c16.10.
- Consider amendment to SMP policy unit boundary 11c16.2 and 11c16.3.
- SMP Policy change procedures to create new policy unit 11c16.10.1.
- Formalise existing former railway embankment as line of defence.
- Stakeholder agreement of longer term plan for mitigation or compensation for loss of habitat within extended defence footprint.



- Potential raising of low spots in existing embankment and road crossing once formalised as a coastal defence (11c16.10.1)



- Liaison between stakeholders about management of the Sandscale Haws and Roanhead site, including access to environmentally sensitive areas
- Stakeholder agreement of longer term plan for mitigation or compensation for loss of habitat within extended defence footprints.

Further details on actions and responsibilities are provided in the **Action Plan**.

11d1 Hodbarrow Point to Selker

Preferred strategic approach: Environmental enhancement – allow the area to function as naturally as possible and look for environmental opportunities, whilst maintaining existing defences at Haverigg and Hodbarrow Lagoon to manage wider scale flood risks.

		Next 10 years	Beyond 10 years
11d 1.1	Hodbarrow Point to Haverigg	Do minimum, with private maintenance of defences. Include frontage in review of all sources of flood risk to Millom and Haverigg.	Continue to reduce risk to assets and property in Haverigg and Millom - maintain and monitor condition of the Outer Barrier, reviewing approach if necessary.
11d 1.2	Haverigg	Maintain existing defences and review standard of protection provided as part of Haverigg and Millom flood risk modelling study to determine timing of possible future defence raising.	Continue to manage risk of coastal erosion and flooding to assets and property in Haverigg. Review risk of outflanking if dunes erode and justification for raising defences.
11d 1.3	Haverigg to Hartrees Hill	Allow area to function as naturally as possible with the dune systems providing natural defence to the low lying area.	
11d 1.4	Silecroft (Hartrees Hill)	Repair and maintenance to the existing private defences subject to defences causing no adverse effects on coastal processes.	Continue to manage risk of coastal erosion to assets and property in Hartrees Hill, Silecroft, considering potential for setting back the defences.
11d 1.5	Hartrees Hill to Selker	Allow area to function as naturally as possible, through a Do nothing approach, whilst allowing localised measures to manage fluvial risk related to blockage of the Annas by the spit.	Allow area to function as naturally as possible but recognising the flood risk caused to hinterland by the migration of Annaside spit.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor foreshore levels, cliff, dune and shoreline change
- Monitor flood risk relating to natural changes to Annaside spit
- Monitor of impacts of defences at Silecroft on coastal processes



- Maintain existing defences where required and subject to funding
- Implement measures to address tide-locking by Annaside spit



- Millom and Haverigg flood risk study (with 11c16.10 and 11c16.11) to review all sources of flood and erosion risk to Millom and Haverigg. Including considering standard of protection provided by existing embankments and establish monitoring of saltmarsh change to determine if/when works will be needed to increase standard of protection.



- Liaison between stakeholders as part of South Millom coastal flood risk study
- Determine future defence requirements for the car park and identification of funding

Further details on actions and responsibilities are provided in the **Action Plan**.

11d2 Selker to Eskmeals

Preferred strategic approach: Promote a more sustainable defence position – continue to reduce risk of coastal flooding and erosion to the coastal road at Stubb Place, whilst investigating options for a longer term relocation of the road. North of Stubb Place allow area to function as naturally as possible, whilst recognising the need to reduce risks to the MoD site.

		Next 10 years	Beyond 10 years
11d2.1	Selker to Stubb Place	Allow area to function as naturally as possible, through implementing no active intervention (no new defences).	
11d2.2 (part)	Stubb Place and Eskmeals dunes (south of MoD site boundary)	Along Stubb Place, continue to manage erosion risk in the short term whilst a longer term solution for relocating the road is considered.	Long term approach will depend upon outcome of studies to consider relocation of road.
11d2.2 (part)	Stubb Place and Eskmeals dunes (north of MoD site boundary)	Allow area to function as naturally as possible, through implementing no active intervention (no new defences), but allow localised management of the shingle ridge to minimise risk to Eskmeals Range.	

Key actions and activities (next 10 years):



- Monitor beach and cliff behaviour
- Monitor condition of defences at Stubb Place – particularly post-storm



- Scheme to implement short term works to reconstruct and modify defences at Stubb Place



- Studies to develop a longer term option for relocating the road
- Development of beach management plan to proactively manage Eskmeals frontage (Qinetiq)



- Raise awareness of flood and storm risk to road users
- Raise awareness of ongoing coastal change to local communities
- Engagement with communities affected by changes to the road



- Liaison with affected communities to facilitate any relocation of assets (Stubb Place, Selker Point)



- Development of funding strategy for long term relocation of road

Further details on actions and responsibilities are provided in the **Action Plan**

11d3 Ravenglass Estuary Complex

Preferred strategic approach: Environmental enhancement – allow the Ravenglass estuary complex to continue to function as naturally as possible, whilst maintaining or improving resilience to Ravenglass and rail infrastructure.

		Next 10 years	Beyond 10 years
11d3.1	Eskmeals Dunes to Ravenglass	No active intervention - allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst recognising the need to manage risk to the viaduct, railway line and local community.	
11d3.2	Ravenglass	Continue to manage risk of coastal flooding and erosion to Ravenglass through proactive maintenance of existing defences.	In longer term, works may be required if risk of overtopping increases. Measures that avoid any significant change to defence footprint are more likely to be environmentally acceptable.
11d3.3	Ravenglass to Drigg Point	No active intervention - allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst recognising the need to manage risk to the viaduct and railway line and local community.	

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh, intertidal change and channel movement
- Monitor changing risks to Network Rail assets



- Proactive patch and repair to degradation/damage of defence assets if required (once ownership confirmed)



- Network Rail to develop Asset Management Plan to ensure strategic approach



- Consider supporting property level protection schemes to adapt to increasing flood risk at Ravenglass



- Liaison between Network Rail, Natural England and Historic England to discuss appropriate future management of Network Rail assets.



- Ensure safe operation of highways (A595 (Muncaster) and U4057 (Ravenglass))
- Safe siting of and monitoring of risk to the England Coast Path



- Undertake appraisal of wider benefits and funding strategy for Ravenglass

Further details on actions and responsibilities are provided in the **Action Plan**.

11d4 Drigg Point to Seascale

Preferred strategic approach: Environmental enhancement – allow the area to function naturally.

Next 10 years

Beyond 10 years

11d4.1

**Drigg Point to
Seascale**

Allow area to function as naturally as possible, through implementing no active intervention (no new defences).

Key actions and activities (next 10 years):



- Continued coastal monitoring, as part of LLWR Environmental Safety Case and Northwest Regional Monitoring Programme

Further details on actions and responsibilities are provided in the **Action Plan**.

11d5 Seascale to St Bees

Preferred strategic approach: Management of coastal risks to infrastructure and community assets by maintaining and reinforcing existing defences, provision of new defences and risk assessments for undefended frontages.

		Next 10 years	Beyond 10 years
11d5.1	Seascale	Continue to maintain defences (through do minimum) whilst a funding strategy is developed to enable proactive maintenance.	Continue to reduce the risk of coastal erosion and flooding to Seascale through improving defences when necessary, subject to funding being secured.
11d5.2	Seascale to Sellafield	Undertake local low tech measures to address erosion issues, as part of a wider asset management plan for the railway.	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets through improving defences when necessary.
11d5.3	Sellafield	Hold the line: through proactive maintenance of defences, as part of a wider asset management plan for the railway.	Continue to reduce the risk of coastal erosion and flooding to Sellafield nuclear site and the railway line through improving defences when necessary.
11d5.4	Sellafield to Braystones	Proactive maintenance of existing defences to the railway, as part of a wider asset management plan for the railway. (Do nothing along undefended stretches.).	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets through improving and extending defences to the railway when necessary.
11d5.5	Braystones, Nethertown, Couderton	Proactive maintenance of existing defences to the railway, as part of a wider asset management plan for the railway.	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets through improving and extending defences when necessary.
11d5.6	Couderton to Sea Mill	Proactive maintenance of existing defences, as part of a wider asset management plan for the railway. (Do nothing along undefended stretches.)	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets through improving and extending defences when necessary.
11d5.7	Sea Mill to Pow Beck	Proactive maintenance of existing defences, as part of a wider asset management plan for the railway.	Continue to reduce the risk of coastal erosion and flooding to the railway line and properties at Sea Mill through improving and building new defences (possibly seaward of car park) when necessary.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor beach and backshore (cliffs and dunes) to improve understanding of changes in risk



- Repair and maintain defences where and when required



- Studies to better understand risks to railway
- Development of Network Rail Asset Management Plan for the entire 11d5 frontage
- Consider need for a change in SMP policy (11d5.2, 11d5.4, 11d5.5, 11d5.6) to support future shoreline management actions and to be consistent with adjacent frontages.



- Liaison with key stakeholders along the frontage to consider multi-benefits of any longer term solution for the policy area.



- Discussion with beach property owners (Braystones, Nethertown and Coulderton) to discuss long terms plans and potential adaptation/ relocation options



- Development of funding strategy for Seascale (11d5.1) and Sea Mill (11d5.7)
- Development of a funding strategy for defence maintenance and future defence improvements for protection of the Sellafield nuclear site (11d5.3).

Further details on actions and responsibilities are provided in the **Action Plan**.

11d6 St Bees

Preferred strategic approach: Promote a more sustainable defence position – continue to reduce risk of coastal flooding and erosion to St Bees, whilst investigating options for a longer term realignment of the coastline, in line with the naturally eroding frontage to the south.

		Next 10 years	Beyond 10 years
11d6.1	Pow Beck to St Bees Promenade	Allow area to function as naturally as possible, through implementing no active intervention (no new defences) along the majority of the frontage whilst allowing continued maintenance of private defences.	In line with the longer term approach for 11d6.2, consider realignment of defences and relocation of cliff top assets. Long term approach will depend upon outcome of studies for 11d6.2.
11d6.2	St Bees Promenade	Continue to reduce flood and erosion risk to hinterland assets at St Bees, whilst recognising the importance of the beach as a recreational and defence asset.	Long term approach will depend upon outcome of studies to consider Managed realignment possibilities, including relocation of assets.

Key actions and activities (next 10 years):



- Monitor beach and cliff behaviour
- Monitor defence condition (including private defences)



- Patch and repair degradation/damage of defence assets if required



- Plan for future studies into potential for realignment and relocation of coastal assets

Further details on actions and responsibilities are provided in the **Action Plan**.

11d7 St Bees Head

Preferred strategic approach: Environmental enhancement – allow the area to function naturally.

Next 10 years

Beyond 10 years

11d7.1

St Bees Head

Allow area to function as naturally as possible, through implementing no active intervention (no new defences).

Key actions and activities (next 10 years):



- Monitor risk to coastal footpath.

Further details on actions and responsibilities are provided in the **Action Plan**.

11e1 St Bees Head to Whitehaven

Preferred strategic approach: Environmental enhancement – allow the area to evolve as naturally as possible to continue to maintain sediment input from the eroding cliffs to supply local beaches and the northerly sediment drift.

		Next 10 years	Beyond 10 years
11e1.1	St Bees Head to Saltom Pit	Allow area to continue to function as naturally as possible (no new defences).	
11e1.2	Saltom Pit	Retain a Hold the line policy which may involve maintaining existing defences (if safe to do so) to protect the Scheduled Monument of Saltom Pit whilst slope stability studies are undertaken .	Consider change in SMP Policy to No Active Intervention (allow defences to fail) following further studies into slope stability
11e1.3	Saltom Pit to Whitehaven	Allow area to continue to function as naturally as possible (no new defences).	
11e1.4	Whitehaven South Beach	Allow area to function as naturally as possible, whilst recognising the need to maintain Whitehaven Harbour structures and with further studies required to appraise the potential contamination risk.	Depending on results of land contamination studies allow area to function as naturally as possible, whilst recognising the need to maintain Whitehaven Harbour structures.

Key actions and activities (next 10 years):



- Monitor site safety and defence condition using UAV



- Maintain existing defences at Saltom Pit if feasible (subject to health and safety constraints)



- Short term slope stability studies for 11e3.2, Saltom Pit



- Additional recording of historical assets before lost to erosion



- Monitoring of risks to footpaths and their users
- Relocation or diversion of United Utilities sewer



- Liaison between stakeholders to review the current situation at Saltom Pit once further studies have been concluded and consider need for a formal change in medium term SMP policy

Further details on actions and responsibilities are provided in the **Action Plan**.

11e2 Whitehaven to Workington

Preferred strategic approach: Management of coastal risks to infrastructure and residential, commercial and community assets by maintaining and reinforcing existing defences, provision of new defences and risk assessments for undefended frontages.

		Next 10 years	Beyond 10 years
11e2.1	Whitehaven Harbour and north beach	Hold the line by maintaining and repairing harbour walls and gates. Consider need for short term scheme to refurbish rock armour at toe of defences.	Maintaining and upgrading harbour defences, harbour gates and rock revetment assuming the harbour remains operational.
11e2.2	Bransty to Parton	Hold the line: through proactive maintenance and reinforcing existing defences.	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets.
11e2.3	Parton	Hold the line: through proactive maintenance and reinforcement of defences	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets.
11e2.4	Parton to Harrington Parks	Hold the line: through proactive maintenance and reinforcement of defences	Continue to reduce the risk of coastal erosion and flooding to the railway line and shoreline assets.
11e2.5	Harrington Parks to Harrington Harbour	Hold the line: by maintaining defences whilst contaminated land is investigated	Allow area to function as naturally as possible in the future but with further studies required to appraise the potential contamination risk from former industrial sites.
11e2.6	Harrington Harbour	Hold the line by maintaining and upgrading harbour defences, harbour gates and rock revetment assuming the harbour remains operational.	
11e2.7	Harrington to Steel Works Site	Hold the line: provide new defences through constructing revetments or seawalls	Continue to reduce the risk or erosion and flooding to the railway line and shoreline assets.
11e2.8	Steel Works Site	Hold the line: improve through constructing new revetments or seawalls. Review location of boundary with 11e2.8	Reduce flood and erosion risk to the redeveloped site.
11e2.9	Steel Works to The Howe	Allow area to function as naturally as possible but with further studies required to appraise the potential contamination risk from industrial slag.	
11e2.10	The Howe to Workington Harbour south breakwater	Allow area to function as naturally as possible but with further studies required to appraise the potential contamination risk from former industrial sites and landfill sites.	
11e2.11	Workington Harbour	Maintaining and upgrading harbour defences, harbour gates and rock revetment.	

Key actions and activities (next 10 years):



- Monitor condition of defences



- Repair and maintain defences where required, potential short term schemes anticipated in 11e2.4, 11e2.7, 11e2.8 and 11e2.11

	Progress (Network Rail) renewal work for defences to railway at Bransty - Parton Sea Walls, Parton - Harrington Sea Walls and Moss Bay Branch Embankment, subject to consents
	- Studies to improve understanding of risks to railway - Development of asset management plans for railway defences - Combined tidal and fluvial flooding and erosion risk assessment for Parton - Further investigations into the vulnerability of the south pier of Harrington Harbour - Review of contamination risk from eroding waste in 11e2.6, 11e2.7 and 11e2.9 - Consider need for a change in SMP policy (11e2.5) or policy unit boundary (11e2.8/11e2.9) to support future shoreline management actions.
	Develop business case for joint scheme to reinforce defences at Whitehaven Harbour North Beach, Workington Harbour and Workington Steel Works site
	- Liaison between stakeholders at Harrington Harbour regarding reuse of dredging and long term protection to the harbour - Developers and local authority to discuss future protection of the shoreline and funding opportunities for Whitehaven Harbour North Beach
	Further studies of erosion and flood risk to proposed area for a major development in 11e2.10

Further details on actions and responsibilities are provided in the **Action Plan**.

11e3 Workington to Maryport

Preferred strategic approach: Management of coastal erosion and flood risks to infrastructure and residential, commercial and community assets by maintaining and reinforcing existing defences whilst undertaking studies into risk of contamination from erosion of former industrial sites.

		Next 10 years	Beyond 10 years
11e 3.1	Workington Harbour to Siddick	Allow area to function as naturally as possible but undertake further studies to appraise potential contamination risk from former industrial sites.	Depending on results of land contamination studies allow area to function as naturally as possible, whilst recognising the need for localised intervention to manage risk to the windfarm.
11e 3.2	Siddick to Risehow	Partnership scheme development study to manage risk to Network Rail and United Utilities infrastructure as well as properties, including investigation of beach management options to reduce risk of tide locking fluvial water courses.	Hold the Line by maintaining and improving defences where justified.
11e 3.3	Risehow to Maryport Marina	Allow area to function as naturally as possible but recognising a possible long-term risk to the railway in the southern part.	
11e 3.4	Maryport Harbour and Marina	Hold the line by maintaining existing defences.	Continue to Hold the line to reduce flood and erosion risk to Maryport and maintain the integrity of the town and marina by maintaining and improving defences where justified.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor backshore, beach and intertidal change
- Monitor impact of refurbished groyne south of Maryport Harbour



- Maintain and repair existing defences
- Maintain beck outfalls at Flimby, including shingle clearance



- Asset management plan for Network Rail defences.
- Contamination risk assessment for frontage north of Workington harbour
- More detailed assessment of the combined coastal and fluvial flood risk to the properties at Flimby and apportionment of benefits between coastal and fluvial schemes, building on ongoing EA study



- Scheme level appraisal for Siddick to Risehow (Flimby) including better understanding of risk and valuation of benefits related to Network Rail and United Utilities infrastructure, option appraisal, funding and consents.



- Liaison between stakeholders regarding regeneration proposals at Maryport Harbour and Marina and needs for future (long term) works to coastal defences.
- Liaison with Natural England regarding the England Coastal Path

Further details on actions and responsibilities are provided in the **Action Plan**.

11e4 Maryport to Dubmill Point

Preferred strategic approach: Allow the coast to function as naturally as possible, whilst managing risk to coastal assets where sustainable. Continue to manage erosion risk to B5300 in the short term whilst implementing a longer-term solution for realigning the B5300 road away from the erosion risk area.

		Next 10 years	Beyond 10 years
11e 4.1	Maryport Harbour to Roman Fort	Continue to reduce erosion risk to Maryport through maintaining the existing defences.	Continue to reduce erosion risk to Maryport through maintaining and, if necessary, upgrading the existing defences.
11e 4.2	Roman Fort to Bank End	Temporarily hold the line, through a do minimum approach whilst longer term options for the frontage are confirmed.	If wider benefits and associated funding can be secured, consider hold the line through improvement to existing defences, otherwise plan for abandonment or realignment of defences.
11e 4.3	Maryport Golf Course to Allonby	Temporarily hold the line, through a do minimum approach, whilst developing realignment scheme	Realign the B5300 and allow natural retreat of shoreline (subject to identifying requirements for localised protection to heritage assets)
11e 4.4	Allonby	Hold the line, through a do minimum approach.	If the beach start to reduce in size, consider measures to continue to Hold the line. Initially this may be through erosion-slowing measures.
11e 4.5	Allonby to Seacroft Farm	Along majority of frontage, manage risk through a do minimum approach. At northern end of unit, temporarily hold the line through reinforcing and extending existing defences to manage the risk to the B5300 and United Utilities infrastructure whilst developing realignment scheme	Realign the B5300 and remove defences
11e 4.6	Seacroft Farm to Dubmill Point	Temporarily hold the line through proactive maintenance to manage the risk to the B5300 at the erosion pinch points whilst developing realignment scheme	Realign the B5300 at pinch points and remove defences south of Dubmill Point

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor dune, beach and intertidal change



- Repair and reinforce existing defences if required
- Maintain Allonby Beck outfall, including shingle clearance



- Modelling of coastal processes to investigate the impacts of allowing erosion of Dubmill Point
- Studies to develop short term approach for defences to B5300
- Review SMP policy at Roman Fort to Bank End as part of plans to cycleway



- Progress investigations into realignment route options
- Progress beach management and or erosion slowing defences at assets near Crossbeck and Oldkiln, subject to consents
- Study to consider need for flood gate refurbishment at Maryport (11e4.1)
- Development of management plans for Maryport (11e4.1) and Allonby (11e4.4)



- Relocation of telecom utilities located in eroded beach between Maryport Golf Course and Allonby



- Manage coastal risks to road users – use of road signs and gates to enforce road closures during poor conditions



- Liaison with Maryport Golf Course to discuss future options



- Seek funding for realignment of B5300 at erosion pinch points

Further details on actions and responsibilities are provided in the **Action Plan**.

11e5 Dubmill Point to Silloth

Preferred strategic approach: Allow the coast to function as naturally as possible, whilst managing risk to coastal assets. Continue to manage erosion risk to B5300 in the short term whilst implementing a longer-term solution for realigning the B5300 road away from the erosion risk area.

		Next 10 years	Beyond 10 years
11e 5.1	Dubmill Point to Silloth	Temporarily hold the line through maintaining or reinforcing existing defences to manage the risk to the B5300 at the erosion pinch points whilst developing realignment scheme	Subject to further studies and funding, realign the B5300 at pinch points and remove the temporary defences at Castle Corner and the north end of Dubmill Point
Key actions and activities (next 10 years):			
		• Monitor condition of defences • Monitor beach and intertidal change • Implementation of monitoring and environmental mitigation for recent rock armour scheme at Dubmill Point.	
		• Repair and reinforce temporary defences if required	
		• Modelling of coastal processes to investigate the impacts of allowing erosion of Dubmill Point	
		• Progress investigations into realignment route options • Seek to extend planning permission for Castle Corner, if required	
		• Seek funding for realignment of B5300 at erosion pinch points	

Further details on actions and responsibilities are provided in the **Action Plan**.

11e6 Silloth to The Grune

Preferred strategic approach: Continue to manage flood and erosion risks to Silloth and Skinburness taking account of risk from both the open coast and back-door flooding from Moricambe Bay while allowing the area to function as naturally as possible. Look for opportunities to enhance environmental sites.

		Next 10 years	Beyond 10 years
11e6.1	Silloth Harbour	Continue to hold the line through maintaining and refurbishing defences within current footprints, assuming that the harbour remains operational.	
11e6.2	Silloth to Skinburness (open coast)	Maintain existing structures to address the flood and erosion risks to the community, property, infrastructure and tourist industry in Silloth.	Continue to reduce erosion risk to Silloth, taking account of increasing risk from Solway channel moving shorewards, increasing exposure of shoreline and increasing flood risk from Moricambe Bay via 11e7.1 and 11e7.2.
11e6.3	The Grune	Allow area to function as naturally as possible, through implementing no active intervention (no new defences), but with ongoing monitoring to assess risk levels.	

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor beach and intertidal change



- Patch and repair degradation/damage of defence assets if required



- Management plans to indicate the need for advance planning of works (and funding sources)
- Future study to improve understanding of the level of wave overtopping and breach related flood risk across the flood cell, including from Moricambe Bay, and the likely erosion limits under Do nothing scenario to improve the economic case for future improvements to beach management



- Geomorphological assessment and modelling of the impacts on coastal processes due to preferred option, in order to design longer term scheme to avoid adverse impacts on the adjacent coastal habitats

Further details on actions and responsibilities are provided in the **Action Plan**.

11e7 Moricambe Bay

Preferred strategic approach: Environmental enhancement – allow the area to continue to function as naturally as possible and look for environmental opportunities for enhancements, whilst maintaining or improving resilience to core communities and infrastructure through localized "Green" low cost shoreline stabilisation if necessary.

		Next 10 years	Beyond 10 years
11e7.1	Skinburness (east)	Continue to manage flooding risk from Moricambe Bay to Skinburness through maintaining flood embankments within existing footprints.	
11e7.2	Skinburness to Wath Farm	Hold the line in short term by maintaining and refurbishing defences within current footprints. Monitor changes to extents of marsh and intertidal areas to allow future assessment of the impacts of the existing defence on natural behaviour of the marsh and consider options for future realignment.	Continue to manage flood risk from Moricambe Bay to Silloth and Skinburness through maintaining existing or set-back flood embankments.
11e7.3	Wath Farm to Saltcoates	Allow area to function as naturally as possible and look for environmental opportunities to enhance designated sites.	
11e7.4	Newton Marsh	Allow area to function as naturally as possible and look for environmental opportunities to enhance designated sites.	Managed realignment through natural defence management - consider opportunities to allow natural expansion of the saltmarsh alongside increasing the flood resilience of the B5307 road in future.
11e7.5	Newton Marsh to Anthorn including Wampool to tidal limit	Allow area to function as naturally as possible and look for environmental opportunities to enhance designated sites.	Managed realignment through natural defence management - consider opportunities to allow natural expansion of the saltmarsh alongside increasing the flood resilience of the B5307 road in future.
11e7.6	Anthorn	Monitor changes to flood and erosion risk to coastal road, United Utilities assets and properties in Anthorn. The SMP policy allows for the potential need to introduce defences if the narrow marsh protecting the road and adjacent properties erodes. Consider enhancement of the marsh through "Green" low cost shoreline stabilisation techniques.	Continue to monitor changes to flood and erosion risk to coastal road, United Utilities assets and properties in Anthorn. If erosion risk increases, low cost environmentally friendly channel erosion protection measures should be considered before resorting to a revetment and low flood wall or earth embankment.
11e7.7	Anthorn to Cardurnock	Managed realignment - consider opportunities to allow natural expansion of the saltmarsh alongside increasing the flood resilience of the road in future.	Continue to monitor flood and erosion risk to coastal road and United Utilities assets. Consider opportunities to allow natural expansion of the saltmarsh alongside increasing the flood resilience of the road in future.

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh, intertidal change and channel movement
- Monitoring of highway condition and safe operation



- Patch and repair degradation/damage of defence assets if required



- Studies to consider long term viability of the B5307 and alternative options



- Liaison between stakeholders to develop options in case erosion risk to Anthorn increases, including consideration of Green Solutions to estuary edge stabilisation.



- Detailed discussion between stakeholders to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas while also seeking to manage risks to homes and infrastructure.

Further details on actions and responsibilities are provided in the **Action Plan**.

11e8 Cardunock to Scottish Border

Preferred strategic approach: Environmental enhancement – allow the area to continue to function as naturally as possible and look for environmental opportunities for enhancements, whilst maintaining or improving resilience to core communities and infrastructure.

		Next 10 years	Beyond 10 years
11e8.1	Cardunock to Bowness-on-Solway	Managed realignment - Consider opportunities to allow natural expansion of the saltmarsh alongside increasing the flood resilience of the road in future.	
11e8.2	Bowness-on-Solway	Hold the line in short term by patch and repair works, with no increase in footprint.	In longer term, works may be required to the toe if the low water channel continue to move landwards. There may also be a need to extend the defences eastwards around 350 m alongshore to extend protection to United Utilities assets and coastal road in 11e8.3
11e8.3	Bowness-on-Solway to Drumburgh	Managed realignment - there may be a need to move the SMP boundary with 11e8.2 to the east to include protection to the coastal road and United Utilities assets	Green solutions and natural defence management to be considered if erosion protection is required to the road.
11e8.4	Drumburgh to Dykesfield	Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	
11e8.5	Dykesfield to Kingmoor (Eden tidal limit)	Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	
11e8.6	Kingmoor to Rockcliffe	Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	
11e8.7	Rockcliffe	Consider the introduction of temporary defences or support for individual adaptation measures to minimise flood risk to village.	Reduce risk of erosion and flooding to properties at Rockcliffe, whilst minimising impacts on the surrounding area and natural environment.
11e8.8	Rockcliffe to Demesne Farm	Allow area to function as naturally as possible but continue to monitor the potential erosion risk to coastal road (and United Utilities asset).	
11e8.9	Demesne Farm to Metal Bridge (Esk)	Allow area to function as naturally as possible and look for environmental opportunities to enhance site.	
11e8.10	Metal Bridge (Esk) to the River Sark	Allow area to function as naturally as possible and look for environmental opportunities to enhance site, whilst considering any long term risk to M6 motorway and railway.	

Key actions and activities (next 10 years):



- Monitor condition of defences
- Monitor marsh, intertidal change and channel movement
- Monitor highway condition and safe operation
- Monitor changing risks to historical assets



- Patch and repair degradation/damage of defence assets if required



- Estuary-wide (cross-border) study looking at future gains and losses in marsh and flats across whole of Solway internationally designated sites and impacts of management changes on both English and Scottish coasts.
- Formal review of SMP Policy at 11e8.2, Bowness-on-Solway and review of location of boundary between 11e8.2 and 11e8.3



- Consider supporting property level protection schemes to adapt to increasing flood risk



- Detailed discussion between stakeholders to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas
- Review of potential coast protection scheme and funding viability for Bowness-on-Solway

Further details on actions and responsibilities are provided in the **Action Plan**.

5 References

Defra (2006) Guidance on the preparation of second generation Shoreline Management Plans (SMP). Available online at: <https://www.gov.uk/government/publications/shoreline-management-plans-guidance>

Environment Agency (2010) Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG)

Halcrow (2011). North West England and North Wales Shoreline Management Plan. North West & North Wales Coastal Group. Main report and appendices. Available online at <https://www.gov.uk/government/publications/shoreline-management-plans-smpls/shoreline-management-plans-smpls>

Appendix A Policy Area Appraisal Reports

Appendix A – Policy Area Appraisal Reports

(provided as 24 separate documents):

Policy Area	District	Policy Area	District
11c8: Heald Brow to Humphrey Head	South Lakeland DC	11d4: Drigg Point to Seascale	Copeland BC
11c9: Kent Estuary	South Lakeland DC	11d5: Seascale to St Bees	Copeland BC
11c10: Humphrey Head to Cark	South Lakeland DC	11d6: St Bees	Copeland BC
11c11: Outer Leven Estuary	South Lakeland DC	11d7: St Bees Head	Copeland BC
11c12: Leven Estuary	South Lakeland DC	11e1: St Bees Head to Whitehaven	Copeland BC
11c13: Bardsea to Piel Island	South Lakeland DC Barrow BC	11e2: Whitehaven to Workington	Copeland BC /Allerdale BC
11c14: Walney Island	Barrow BC	11e3: Workington to Maryport	Allerdale BC
11c15: Walney Channel (mainland)	Barrow BC	11e4: Maryport to Dubmill Point	Allerdale BC
11c16: Duddon Estuary	Barrow BC/ South Lakeland DC/ Copeland BC	11e5: Dubmill Point to Silloth	Allerdale BC
11d1: Hodbarrow Point to Selker	Copeland BC	11e6: Silloth to The Grune	Allerdale BC
11d2: Selker to Eskmeals	Copeland BC	11e7: Moricambe Bay	Allerdale BC/ Carlisle CC
11d3: Ravenglass Estuary Complex	Copeland BC	11e8 Cardurnock to Scottish Border	Allerdale BC/ Carlisle CC

Appendix B Strategy Action Plan

[Provided as a separate file]