

Cumbria Coastal Strategy

Engagement summary

November 2019



01 Introduction

Cumbria County Council is working with the Cumbria Coast Protection Authorities and the Environment Agency to develop a strategy for the future management of the coast from Arnside to the Scottish Border.

A coastal strategy is a plan that sets out how we will manage the risks related to coastal flooding and erosion along our coastline over the next century. It is also needed for us to get approval from the government for future flood and coastal risk management schemes and to help get national funds to contribute to the cost of defences.

This strategy forms a key step in setting out our future approach to managing risks and will feed into our local plans.

It builds upon the policies set in the North West Shoreline Management Plan, which was adopted in 2010, and will decide on the best approaches to carry out those policies.

In some places, we will be recommending a change in Shoreline Management Plan policy.



02 What do different terms mean?

Within this document we use technical words to explain the ideas we have about managing future coastal flood and erosion risks. These are explained in this section.

Shoreline Management Plan

A Shoreline Management Plan provides a large-scale assessment of the risks associated with coastal processes. A plan including our coastline was adopted in 2010 and covered the coast from Great Ormes Head in Wales to the Scottish Border. It set out policies for the short (next 20 years), medium (20 to 50 years) and long (beyond 50 years) terms.

The Shoreline Management Plan divided the Cumbria coast into 25 areas, known as **policy areas**, each of which include a number of **policy units**. We have used the same units.

Shoreline Management Plan policy

This describes how your stretch of shoreline is most likely to be managed to address flood or erosion. There are four Shoreline Management Plan policies that were used for all Shoreline Management Plans in England and Wales:

| policy | what does this mean? |
|------------------------|---|
| No active intervention | There will be no further investment in coastal defences or operations and no new defences will be built. |
| Hold the line | The aim is to retain the shoreline in its current position. This might involve maintaining current defences or constructing new defences in the future. |
| Managed realignment | Allowing the shoreline to move backwards or forwards, with measures to control or limit movement. |
| Advance the line | Building out the coastline through construction of new seaward defences. |

Policy areas

These are lengths of coast or estuary where actions along one stretch may affect another stretch due to sediment links. It usually includes a number of policy units.

Policy units

These are stretches of coast for which a separate shoreline management policy has been set. Usually they cover stretches which are similar in form, for example there are cliffs fronted by beaches, or where there are similar features at risk, for example along a town.

Coastal strategy

Strategies are the second level in the shoreline management system. They look at how we can carry out the Shoreline Management Plan policies for smaller stretches of coast in more detail. Shoreline Management Plan policies can occasionally change as a result of these strategies. We have used the same policy units as the Shoreline Management Plan. Some of these policy units have been recognised as **priority units**.

Priority units

There are stretches of coast where we think there are coastal defence management needs in the short term. We have looked at a range of approaches for these units:

Approaches

For the priority units we have looked at a number of different approaches:

| approach | what does this mean? |
|---------------------|---|
| Do nothing | This means walking away from the defences and undertaking no further work. Existing defences will fail over time and erosion and flood risk will increase. On frontages without defences there would be no new interventions. We have to consider this at all locations, as a baseline. |
| Do minimum | This means we will only carry out patch and repair of existing defences. Again, their condition will worsen over time and the level of protection will decrease. There may become a time when we can't continue works. |
| Hold the line | There are three approaches. We can maintain defences, which means we won't address any increases in sea level. We can sustain defences, which means we raise or reinforce defences to address any increase in risk. Or we can improve defences and provide a better level of protection. The improve approach also applies to building new defences on frontages where there are none at present. |
| Managed realignment | Where erosion is the key concern, this might involve defences to slow erosion, or building defences once assets are at risk. Where flooding is the key concern this might involve constructing defences in a more sustainable landward location or removing defences and allowing retreat to naturally higher land. |

03 The project

We are working with Jacobs to develop our plan.

In May 2017 we commissioned Jacobs, an independent engineering consultant, to help us develop this strategy.

We have since carried out several studies to understand the unique features of our coastline and to look at what may be at risk for coastal erosion and flooding, both now and in the future.

We have used these studies to decide on where to focus our efforts and have started to consider how we might best manage risks along our shorelines in the future.

You said, we listened.

Between November and December 2018 we invited everyone living, visiting or working on or near the coast to take part in determining how their local coastline should be managed. We held a series of drop-in events, in Silloth, Whitehaven, Millom, Barrow-in-Furness and Grange over Sands. An on-line and paper survey were also available.

We have used the feedback provided to inform our decisions and to help us define preferred approaches for the priority frontages.

We are now asking for your views on the final proposals.



Have your say

This document provides details of our final proposals and includes details of future recommended activities.

More detailed information on the ideas and approaches that have been considered for each frontage is available on the project website www.cumbria.gov.uk/ccs.

Tell us what you think using the questionnaire, available on the website.

04 What you can find in this document

We have looked at the entire coastline of Cumbria and considered how we might manage risks from coastal erosion and flooding in the future.

The Shoreline Management Plan divided the Cumbria coast into **25 policy areas**. Each policy area includes a number of **policy units**. We have used these same units in our strategy.

We have decided which policy units may have coastal defence management needs in the short term. This may be where:

- there are key assets at possible risk from coastal flooding or erosion,
- the current Shoreline Management Plan policy has been questioned, or
- there are opportunities to improve the environment and bring benefits to an area.

We have called these **priority units**. Here, we have looked at different approaches to dealing with future coastal flood and erosion risks and developed a preferred approach based on technical appraisals and feedback from the consultation events.

Along the rest of the coast, we have considered the current Shoreline Management Plan policy and recommended future activities.



Find out more

In this document, you can find information on:

- whether your frontage lies within a priority or non-priority unit
- key issues and opportunities
- our preferred approach from considering costs, benefits provided and impacts on the wider environment



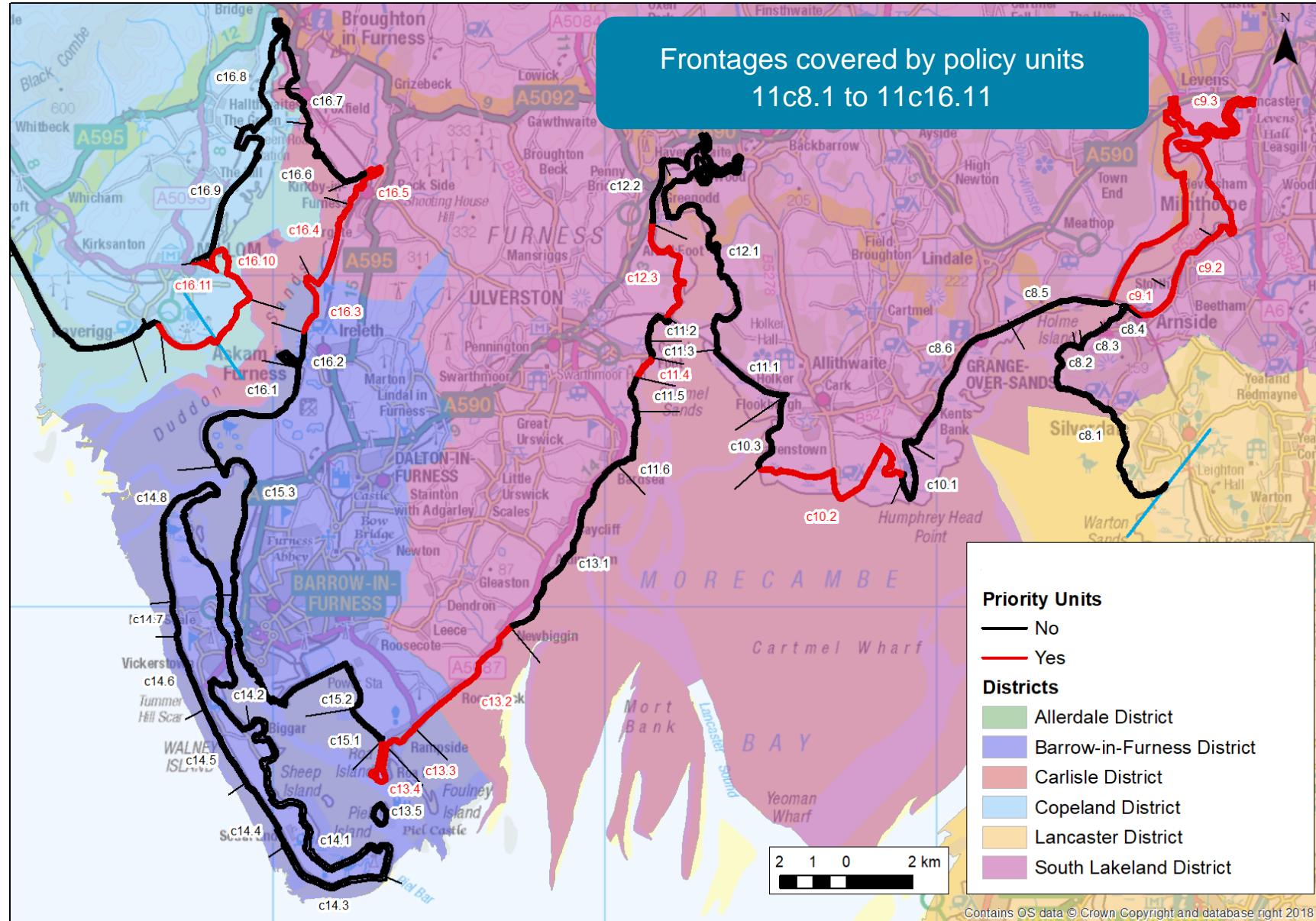
Visit our website

More details can be found on our project website www.cumbria.gov.uk/ccs

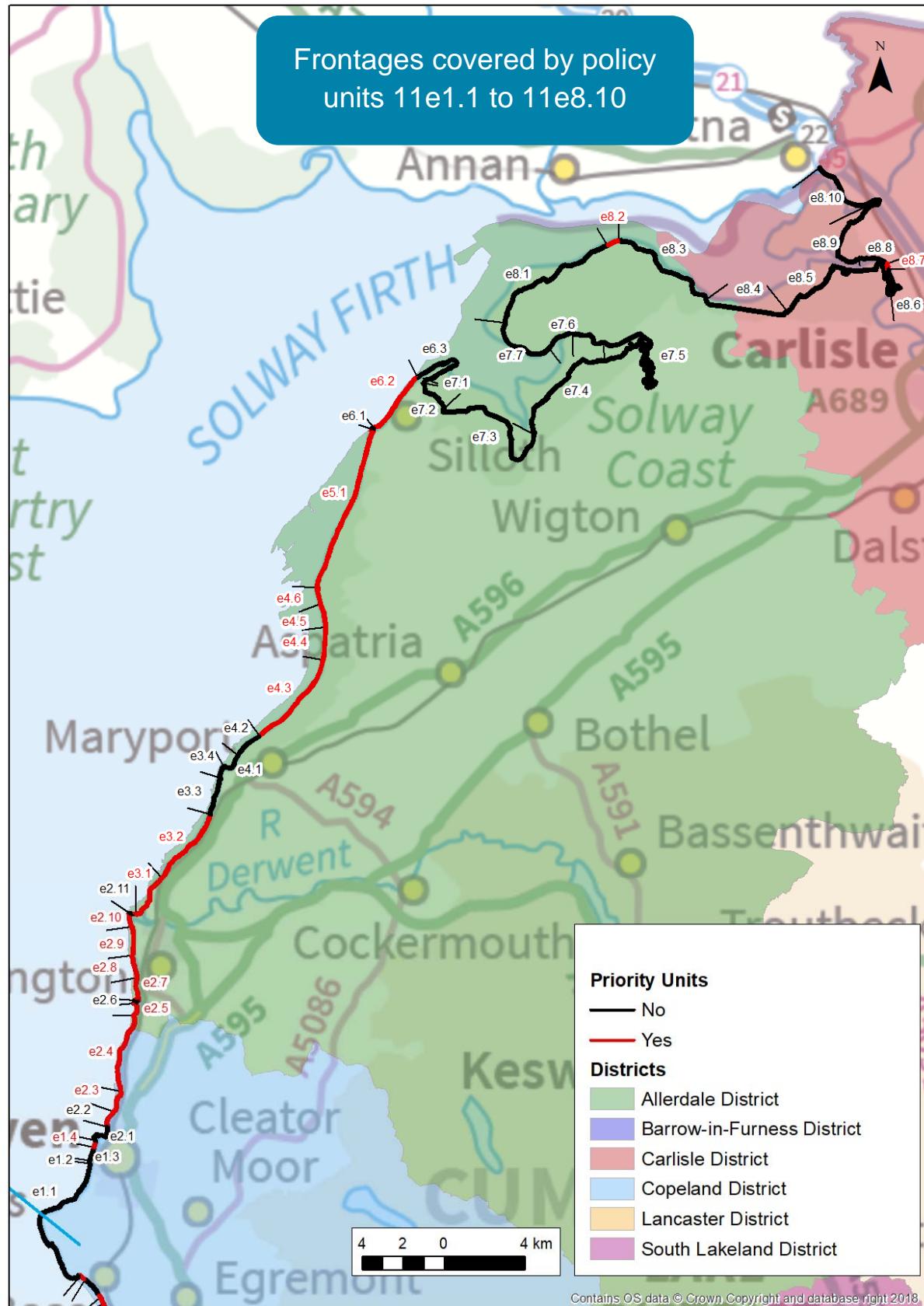
Here you will find a detailed report for each policy area and a separate Action Plan, which sets out future activities for all areas.

05 Finding your frontage

| responsible authority | policy area and number | go to page |
|--|------------------------------------|----------------------|
| South Lakeland District Council | 11c8: Heald Brow to Humphrey Head | ➤ 10 |
| | 11c9: Kent Estuary | ➤ 16 |
| | 11c10: Humphrey Head to Cark | ➤ 21 |
| | 11c11: Outer Leven Estuary | ➤ 25 |
| South Lakeland District Council and Barrow Borough Council | 11c12: Leven Estuary | ➤ 31 |
| | 11c13: Bardsea to Piel Island | ➤ 37 |
| | Barrow Borough Council | 11c14: Walney Island |
| 11c15: Walney Channel (mainland) | | ➤ 49 |
| South Lakeland District Council, Barrow Borough Council & Copeland Borough Council | 11c16: Duddon Estuary | ➤ 53 |
| | 11d1: Hodbarrow Point to Selker | ➤ 64 |
| | 11d2: Selker to Eskmeals | ➤ 69 |
| | 11d3: Ravenglass Estuary Complex | ➤ 73 |
| | 11d4 Drigg Point to Seascale | ➤ 77 |
| | 11d5: Seascale to St Bees | ➤ 79 |
| | 11d6: St Bees | ➤ 87 |
| | 11d7: St Bees Head | ➤ 90 |
| Copeland Borough Council | 11e1: St Bees Head to Whitehaven | ➤ 91 |
| | 11e2: Whitehaven to Workington | ➤ 95 |
| | 11e3: Workington to Maryport | ➤ 105 |
| Copeland Borough Council and Allerdale Borough Council | 11e4: Maryport to Dubmill Point | ➤ 109 |
| | 11e5: Dubmill Point to Silloth | ➤ 115 |
| | 11e6: Silloth to The Grune | ➤ 118 |
| | 11e7: Moricambe Bay | ➤ 121 |
| | 11e8 Cardurnock to Scottish Border | ➤ 127 |
| Allerdale Borough Council | | |
| Allerdale Borough Council & Carlisle City Council | | |







11c8: Heald Brow to Humphrey Head



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---------------------------------|--|------------------------|
| South Lakeland District Council | 11c8.1 Heald Brow to Frith Wood | no |
| | 11c8.2 New Barns | no |
| | 11c8.3 Grubbins Wood | no |
| | 11c8.4 Meadow to the Kent viaduct | no |
| | 11c8.5 Kent viaduct to Holme Island | no |
| | 11c8.6 Holme Island to Humphrey Head (Grange-Over-Sands) | no |

This Policy Area covers the banks of the outer Kent Estuary running along the east bank from Arnside to the viaduct, and the viaduct to Humphrey Head on the west bank. The area fronts part of Morecambe Bay, one of the largest areas of intertidal estuarine flats in Britain and is internationally significant for wintering wading birds and nationally important for wintering wildfowl. The area is also designated under the Arnside & Silverdale Area of Outstanding Natural Beauty (AONB).

The following sections provide further details for each policy unit

11c8.1 Heald Brow to Frith Wood

The current Shoreline Management Plan policy is No active intervention from the short term. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

There are limited properties or other assets at risk from erosion or flooding. As such there is no economic justification for building new defences here. This is also an important area for its natural landscape and environmental habitats it supports.

We recommend a number of future activities, such as:

- Continued monitoring of the condition of designated conservation sites.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Safe siting of the England Coast Path.

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

11c8.2 New Barns

The current Shoreline Management Plan policy is No active intervention from the short term. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

Although the access track along this stretch is already inaccessible on certain tides and will flood more frequently with sea level rise, there are not sufficient assets at risk to justify national expenditure.

There may be potential to create new intertidal areas, but alternative funding would need to be found. Early consultation with AONB Partnership is recommended.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline change.
- Continued monitoring of the condition of designated conservation sites.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Should the risk to the access track increase, early discussion should be held between the landowners, operators of the campsite and Natural England to discuss possible options and the need for further studies.
- Safe siting of the England Coast Path.

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

11c8.3 Grubbins Wood

The current Shoreline Management Plan policy is No active intervention from the short term. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

There are limited properties or other assets at risk from erosion or flooding. As such there is no economic justification for building new defences here.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline change.
- Continued monitoring of the condition of designated conservation sites.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Safe siting of the England Coast Path.

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

11c8.4 Meadow to the Kent viaduct

The current Shoreline Management Plan policy is Hold the line from the short term. We do not think that the policy should change at this time.

The aim of the policy is to manage coastal risks to communities and amenities in Arnside. The defences are in a reasonable condition and so in the short term, these should be sustained through undertaking maintenance works within the existing defence footprints.

There may be a need to improve the defences in the future, beyond the next 10 years. This will be informed by continued monitoring of shoreline change and deterioration of the defences. Further option appraisal will be required at this stage, to assess technical, economic and environmental viability of different approaches. Early consultation with AONB Partnership, Natural England and Morecambe Bay Partnership is recommended.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. Any modification to or replacement of the existing structures would also require consent from Natural England.

- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Safe siting of the England Coast Path.

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

11c8.5 Kent viaduct to Holme Island

The current Shoreline Management Plan policy is Hold the line from the short term. This policy will manage risks to the important Furness Line and to isolated properties, minor roads, golf course and the A590.

The defences are in a reasonable condition and so in the short term, these should be sustained through undertaking maintenance works within the existing defence footprints. In the longer term it is likely that works will be needed to improve the defences. This will be informed by continued monitoring of shoreline change and deterioration of the defences. Further option appraisal will be needed at this stage.

As building further defences could impact on important habitats across the intertidal area, we may need to look at where we could compensate for the loss or damage through managed realignment. This would involve a number of additional studies to look at what habitats we could create and also the effects on flood risk around the estuary.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary (mainly by Network Rail).
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. Any modification to or replacement of the existing structures would also require consent from Natural England.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c8.6 Holme Island to Humphrey Head (Grange-Over-Sands)

The current Shoreline Management Plan policy is Hold the line from the short term. This will manage risk to communities and amenities in Grange-over-Sands.

We do not think that the policy should change at this time. At present, no major works are required to the defences as an extensive saltmarsh protects Grange Promenade, although maintenance works are required to address flooding due to blocking of culverts by sediment.

Recent monitoring does, however, show that the marsh is currently eroding. It is therefore possible that further works to the defences may be needed in the future.

If new defence works are needed, these could impact on important habitats across the intertidal area and we may need to look at where we could compensate for the loss or damage to the area through managed realignment elsewhere.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary (mainly by Network Rail).
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. Any modification to or replacement of the existing structures would also require consent from Natural England.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- An Environment Agency project to address fluvial flooding caused by tidal locking and blockage from saltmarsh accretion.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c9: Kent Estuary



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|--|---|------------------------|
| Environment Agency, Highways England, Cumbria County Council, private landowners | 11c9.1 Kent viaduct to Dick Fell Road (Sandside) | yes |
| | 11c9.2 Sandside (Dick Fell Road to Hollins Well Road) | yes |
| | 11c9.3 Hollins Well Road north to Levens Bridge (east bank) & Levens Bridge to Kent viaduct (west bank) | yes |

This policy area is landward of the Coast Protection Act boundary so does not lie within South Lakeland District Council's responsibility as a Coast Protection Authority.

The key risk is from flooding and there are particular concerns regarding the A590. Other access roads, the coastal railway and large tracts of agricultural land are also at risk. The risk is not just from tidal flooding but also from rivers and surface waters.

The inner Kent Estuary is very important for the habitats it supports and is covered by many national and international environmental designations, including the Arnside and Silverdale AONB. There may be opportunities for managed realignment, which could expand and improve the range of habitats supported, but could involve loss of, or changes to, agricultural land.

 The following sections provide further details for each policy unit 

11c9.1 Kent viaduct to Dick Fell Road (Sandside) (priority unit)

The key risk is along this frontage is from flooding, and a key asset at potential risk is the B5228 road, which is the main route to Arnside. The current flood defence consists of a disused railway embankment which is managed by the Environment Agency. We are not sure what level of protection the embankment provides, but it is believed to be in a reasonable condition.

The current Shoreline Management Plan policy is to Hold the line in the short term and then Managed realignment beyond this, through realignment of defences to create areas of new habitat. However, any large scale realignment (or abandonment) of flood defences is likely to have consequences elsewhere within the estuary through affecting flows, water level and sediment distribution. A costly diversion of the B5228 would also be needed to allow realignment of the front-line defence. The studies needed to support this have not yet been undertaken.

Therefore, over the next 10 years our recommended strategic approach for this stretch of coast is to continue to Hold the line in the short term by maintaining the existing defences through proactive maintenance. This will allow time for a long-term solution to be developed and funding sought. We will work closely with Natural England, Arnside and Silverdale AONB Partnership, National Park and World Heritage Site to minimise impact on the natural environment when undertaking these maintenance works.

Further works will be needed in the future to address any increase in sea level. Improving existing defences would provide the most efficient solution, but funding needs to be sought and there would be potentially adverse effects on the designated sites. To address these adverse impacts, as part of these works, there may be local opportunities for a regulated tidal exchange scheme. This would involve allowing controlled tidal flooding of land behind existing defences in a way that creates or restores habitat without increasing flood risk to the wider area. But we need to investigate this further.

We recommend a number of future activities, such as:

- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Continued monitoring of intertidal change.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. This would be developed through engagement and consultation with AONB Partnership, National Park and World Heritage Site and Natural England.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.

- Additional studies to explore the potential for habitat creation through a regulated tidal exchange approach.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c9.2 Sandside (Dick Fell Road to Hollins Well Road) (priority unit)

The B5282 runs adjacent to the shoreline along most of the frontage. In some locations the road is protected by a rock revetment and low flood wall with fronting marsh, but elsewhere there is a low retaining wall or sloping revetment protecting the edge of the road, with little marsh remaining. These defences are managed by Cumbria County Council.

The current Shoreline Management Plan policy is Hold the line. We do not think that the policy should change at this time, but as building further defences could impact on important habitats across the intertidal area, we may need to look at where we could compensate for the loss or damage through managed realignment.

This would involve a number of additional studies to look at what habitats we could create and also the effects on flood risk around the estuary. We also need additional information on the existing defences, to understand the standard of protection these provide.

The preferred approach in the short term is therefore to maintain the existing defences through proactive management. We will work closely with Natural England, AONB Partnership, National Park and World Heritage Site to minimise impact on the natural environment when undertaking these maintenance works.

This will allow us time to consider opportunities for habitat creation to offset losses due to coastal works and also for funding to be sought for future works.

In the long term, the intention would be to continue to hold the line, but further studies are needed to decide upon the most suitable and affordable option. A whole catchment approach is required to manage the flood risk, which would need to take into account proposals for other frontages within the estuary and consider the need for habitat creation as part of a compensation requirement for direct losses.

We recommend a number of future activities, such as:

- Inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Continued monitoring of intertidal change – this may identify that improvement to the defences is likely to be needed earlier.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. This

would be developed through engagement and consultation with AONB Partnership, National Park and World Heritage Site and Natural England.

- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c9.3 Hollins Well Road north to Levens Bridge (east bank) & Levens Bridge to Kent viaduct (west bank) (priority unit)

The key risk to this area is from flooding and the A590 and A6 at Levens Bridge can flood and become impassable when a high tide coincides with high river levels. The risk is not just from tidal flooding but also from rivers and surface waters. Most shoreline defences are managed by the Environment Agency, but along some sections there are private defences. The approach to fluvial risk and land drainage management on the west bank is also changing. The Environment Agency has served notice on the land drainage pumps and is looking to hand over responsibility to landowners or an Internal Drainage Board.

The current Shoreline Management Plan policy is Hold the line in the short term then Managed realignment beyond this, involving construction of set back defences. However, any large scale realignment of flood defences is likely to have consequences elsewhere within the estuary through affecting flows, water level and sediment distribution. The studies needed to support this have not yet been undertaken.

Therefore, over the next 10 years our recommended strategic approach for this stretch of coast is to continue to Hold the line in the short term by maintaining the existing defences through proactive maintenance, whilst further studies are undertaken to look at local opportunities for managed realignment. This will allow time for a long-term solution to be developed and funding sought. We will work closely with Natural England, AONB Partnership, National Park and World Heritage Site to minimise impact on the natural environment when undertaking these maintenance works.

The long term approach (beyond 10 years) is likely to involve a mixture of hold the line, through improving existing defences, and construction of set back defences to create habitat sites.

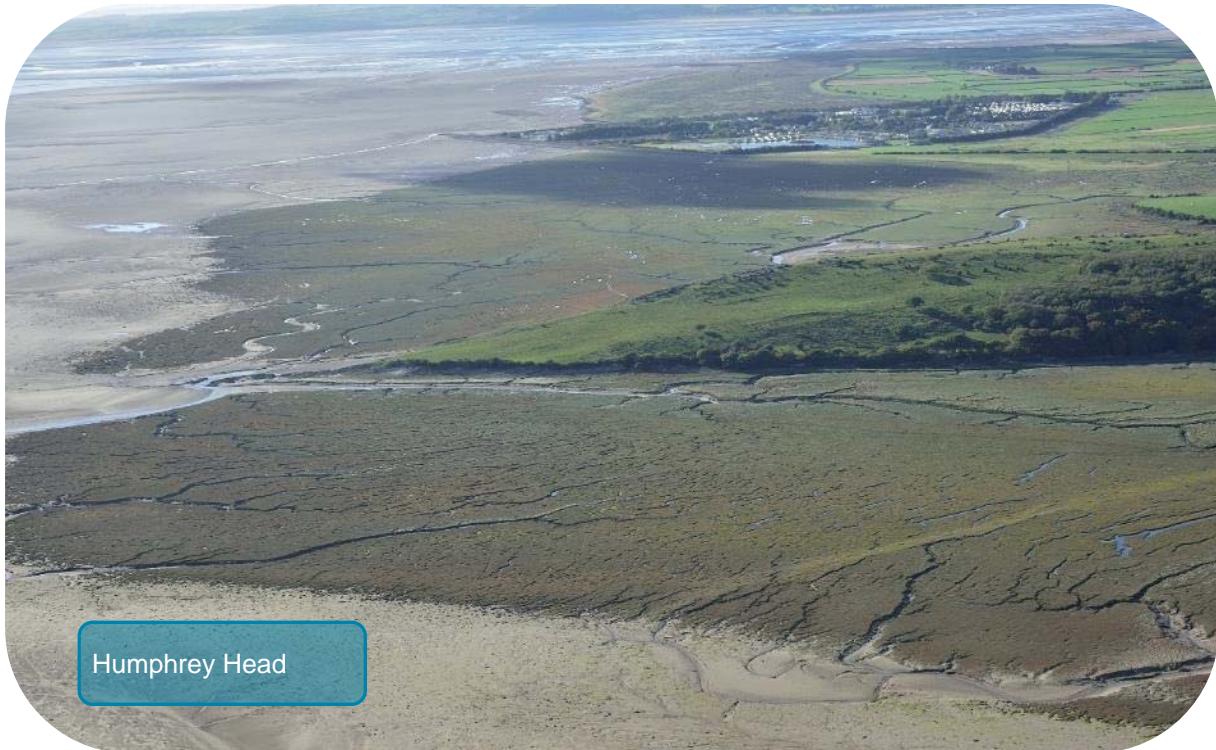
We recommend a number of future activities, such as:

- Inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.

- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. This would be developed through engagement and consultation with AONB Partnership, National Park and World Heritage Site and Natural England.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Further studies to explore the potential for habitat creation and to fully understand the implications of locally realigning sections of defences.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c10: Humphrey Head to Cark



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|--|------------------------|
| South Lakeland District Council, Environment Agency, Bourne Leisure | 11c10.1 Humphrey Head | no |
| | 11c10.2 Humphrey Head to Cowpren Point | yes |
| | 11c10.3 Cowpren Point to Cark | no |

Although much of the area is low-lying and comprised of soft sediments, there are natural hard points such as Cowpren Point and Humphrey Head. The key risk to this policy area is from flooding. Currently the low-lying areas of the peninsula are protected by manmade embankments. These are fronted by saltmarsh and extensive mudflats.

This area has a high environmental value with fringing saltmarsh and intertidal flats supporting a wide range of habitats and qualifying species. As such, international designations cover the intertidal zone and adjoining terrestrial areas.

 The following sections provide further details for each policy unit 

11c10.1 Humphrey Head

This unit covers the outcrop of Humphrey Head. There is a possible flood route between Humphrey Head and the adjacent outcrop of Kirkhead, but this is considered within unit 11c8.5.

The current Shoreline Management Plan policy is No active intervention from the short term. There are no defences present and the intention of the policy is to allow natural processes to continue as there are limited assets at risk. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal area.
- Monitoring of the highway condition and safe operation. It may be necessary to close the road on occasion for health and safety reasons.
- Safe siting of the England Coast Path taking account of future risks.

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

11c10.2 Humphrey Head to Cowpren Point (priority unit)

The current Shoreline Management Plan policy is Hold the line in the short term followed by Managed realignment with localised Hold the line in the medium and long term. Localised defences are permitted, subject to landowner agreement and appropriate consents.

There are currently approximately 6 km of embankments providing tidal defence to this unit, these were refurbished and raised in the early 1990s. Movement of the low water channels in Morecambe Bay led to undercutting along the toe of defences at Lakeland Leisure Park. Emergency works were carried out in Spring 2008.

A strategy produced for Lakeland Leisure Park in 2009 has previously recommended the continued maintenance of the existing defences, through repair and replacement of the defence and extension of East Plain breakwater and Cross Embankment.

At West Marsh a proposal for a coastal saline lagoon habitat improvement scheme has also recently been consented. This would cover an area immediately west of the Lakeland Leisure Park and would involve excavating a series of shallow open water lagoons in the existing saltmarsh to promote biodiversity enhancements.

Whilst the Shoreline Management Plan vision was to create a more sustainable and natural alignment from the medium term, through carrying out realignment along part or all of the frontage, studies to support this have not yet been undertaken. Since the Shoreline Management Plan there has also been further investment in the existing defences undertaken by Lakeland Leisure Park to address issues of undercutting along their site, which will prolong their life. Although the current defences are holding the shoreline locally in an unnatural position, there is little evidence to

suggest that they are substantially affecting shoreline change along adjacent areas; erosion and accretion trends are predominately driven by the movement of the low water channel.

Therefore, the recommended strategic approach for this stretch of coast is to continue to hold the line, through proactive management in the short term. These works will extend the life of existing defences and address the ongoing issues of undercutting. This will allow time for a longer term solution to be developed and funding sought.

In the future, it is likely that defences would need to be improved to address increasing levels of risk due to sea level rise, but options will need to be reappraised at this stage, particularly as there is potential that the current situation could dramatically alter if the low water channel infills or moves away from the frontage. Future plans for this frontage should also take account of recently consented coastal saline lagoon habitat creation, which, if successful, could possibly be extended to create further habitat.

We recommend a number of future activities, such as:

- Inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary (Environment Agency and Lakeland Leisure Park).
- Monitoring of the scheme to create an area of coastal saline lagoon habitat for waders and breeding birds, once this has been constructed.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. This should be developed through engagement and consultation with AONB Partnership, Natural England and Lakeland Leisure Park.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Further studies to explore the potential for habitat creation and to fully understand the implications of locally realigning sections of defences.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c10.3 Cowpren Point to Cark

The current Shoreline Management Plan policy is No active intervention from the short term. There are no defences present and the intention of the policy is to allow natural processes to continue.

We do not think that the policy should change at this time and this would be implemented through a Do nothing approach. However, this area is identified as a possible flood route to 11c10.2, therefore monitoring is required to assess levels of flood risk in the future.

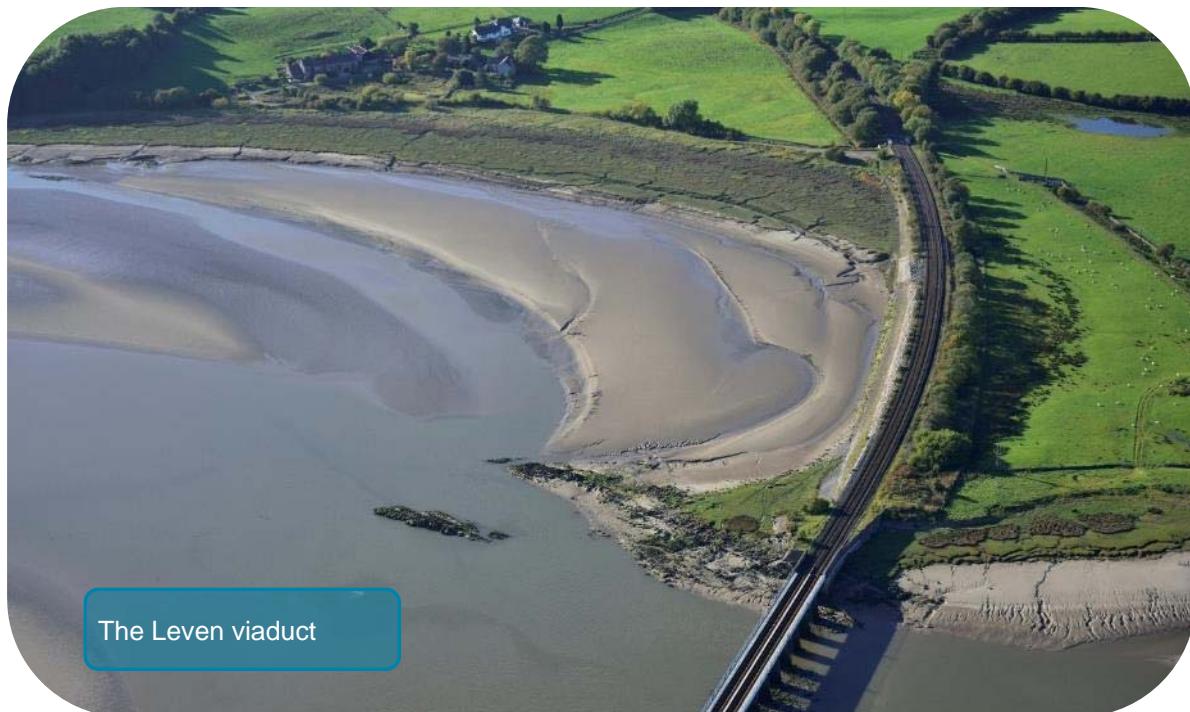
Possible realignment options for unit 11c10.2 may also mean the policy boundary should change and so this may need to be considered again in the future reviews of the strategy.

We recommend a number of future activities, such as:

- Continued monitoring of the marsh and channel movements.
- Any review of policy for unit 11c10.2 would need to take account of impacts on this frontage.
- Safe siting of the England Coast Path taking account of future risks.

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

11c11: Outer Leven Estuary



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|--|------------------------|
| Network Rail, South Lakeland District Council, Environment Agency, GlaxoSmithKline, private landowners | 11c11.1 Cark to Leven viaduct | no |
| | 11c11.2 Leven viaduct to Canal Foot cottages | no |
| | 11c11.3 Canal Foot | no |
| | 11c11.4 Glaxo Factory Site (south) | yes |
| | 11c11.5 Sandhall to Conishead Priory | no |
| | 11c11.6 Conishead Priory to Bardsea | no |

This policy area extends from Cark Village in the east to Bardsea in the west and covers both the east and west banks of the outer Leven Estuary, up to the viaduct.

The key issue is management of tidal flood risk to the south Ulverston flood cell. This flood risk area is currently protected by defences in several policy units.

The following sections provide further details for each policy unit

11c11.1 Cark to Leven viaduct

The current Shoreline Management Plan policy is No active intervention from the short term, with works only undertaken if the railway is at risk.

The recommended strategic approach would be to continue to manage the risk to the railway, through maintaining and upgrading existing defences in the future, should erosion of the fronting marsh increase exposure. A change in policy to be consistent with elsewhere and to clarify the intention of management may be appropriate.

We will need to carry out continued monitoring to look at the changing risk to this frontage. Currently there is a wide expanse of marsh along this frontage, but this is affected by movements in the low water channel. This means that at times the marsh area has grown, but it can also erode. The position of the railway means that instead of whole system being able to move naturally as the channel changes, the inland edge of the marsh stays fixed and so the overall area of marsh reduces if the seaward edge erodes.

The Shoreline Management Plan suggested consideration of regulated tidal exchange, which would create new habitat. Regulated tidal exchange involves allowing controlled tidal flooding of land behind existing defences in a way that creates or restores habitat without increasing flood risk to the wider area. Additional studies would be needed to explore this option further.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. Any modification to or replacement of the existing structures would also require consent from Natural England.
- Additional studies to explore the potential for habitat creation through a regulated tidal exchange approach.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c11.2 Leven viaduct to Canal Foot cottages

The current Shoreline Management Plan policy is No active intervention from the short term.

We do not think that the policy should change at this time, and this would be implemented through a Do nothing approach. But investigations may be needed to assess possible contamination risk from historical licenced landfill sites at Plumpton quarries.

The exception to this would be along the short section of railway and associated defences, which lie within this policy unit. Here the recommendation is for continued maintenance of the existing defences.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change and channel movement.
- Investigation into the potential contamination risk posed by future erosion of two historical licenced landfill sites at Plumpton quarries.
- Continued inspection and maintenance of the existing defences along the railway embankment, with repairs and remedial works undertaken as necessary (Network Rail).
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources if new defences are needed. This should be developed through working closely with Network Rail, Natural England, National Trust, Cumbria County Council and South Lakeland District Council.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c11.3 Canal Foot

The current Shoreline Management Plan policy is Hold the line. The intention is to continue to manage the flood and erosion risk to community and amenities by maintaining the existing defences.

We do not think that the policy should change at this time, but there may be a need to upgrade or even replace existing defences in the future. Some of the assets within this frontage have an expected residual life of more than 10 to 20 years and will only require proactive maintenance, but others require more urgent attention.

Any modification or replacement of the existing structures would need consent from Natural England as there could be an impact on important habitats. We may also need to look at where we could compensate for any loss or damage through managed realignment.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change and channel movement.

- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken by private owners as necessary.
- Investigation to allow a strategic defence to be developed along the frontage, inclusive of the lock gate, to manage and adapt to the increasing long term risk of flooding due to sea level rise. This work will also need to consider possible funding sources.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c11.4 GSK Factory Site (south) (priority unit)

The current Shoreline Management Plan policy is No active intervention as there are limited assets at risk of coastal erosion. However, there is potential contamination risk due to the reclaimed land and licenced landfill south of the GSK Factory Site. The longer term suitability of the Shoreline Management Plan policy also depends upon future proposals for part of the existing operational GSK site – currently these are not known. There is also a potential linkage to a much larger flood area, if the slag bank continues to erode.

Given the limited assets directly at risk, in the short term, No active intervention through a Do nothing approach remains appropriate, subject to further monitoring of the situation. The longer term approach remains uncertain, but even if part(s) of the existing GSK site are not developed / redeveloped, there is a need to monitor erosion of the slag bank and assess the risk of breach which could have wider reaching impacts. Further assessment of the contamination risk from erosion of slag material also needs to be undertaken.

If the part(s) of former GSK site are developed/redeveloped in the future, there could be a need to change policy to hold the line and under a hold the line policy the preferred approach would be to construct a new revetment or seawall, subject to funding. A change in Shoreline Management Plan policy would require a formal change process to be followed, including community and stakeholder consultation.

The following activities are recommended in the future:

- Monitoring of erosion to improve our understanding of the risk of breaching.
- Further investigation into the potential contamination risk posed by ongoing erosion, particularly at the southern extent of the site.
- The Environment Agency are currently progressing a study 'South Ulverston Integrated Flood Risk Management Scheme' looking into short term tidal flood risk reduction measures. Consideration of this frontage should be an integral part of this study.

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

11c11.5 Sandhall to Conishead Priory

The current Shoreline Management Plan policy is Hold the line in the short term by maintaining the existing defences. This allows time for investigating the potential to set back the defences under a policy of Managed realignment, but the intention is for long term management of the flood risk.

There is a shared flood area for this frontage, which means that any tidal flooding through this frontage has the potential to affect a wider area. This policy will therefore manage the flood risk to the communities and amenities in this large south Ulverston Flood cell, risk to the historically land fill sites and industrial and commercial sites, avoiding pollution risk.

We do not think that the policy should change at this time, subject to further studies.

We recommend a number of future activities, such as:

- Investigate opportunities and need to set back the defences in the medium term, to reduce flood risk to south Ulverston and provide most cost-effective approach to policy delivery. There may be opportunities associated with onshore flood alleviation schemes that should be explored.
- Confirm preferred approach and extent of realignment potential for habitat gains. This work will also need to consider possible funding sources.
- Any realignment of the existing structures would also require consent from Natural England due to the designation of the intertidal zone and early discussions with Natural England are recommended.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c11.6 Conishead Priory to Bardsea

The current Shoreline Management Plan policy is No active intervention although private defences may be permitted subject to consent. The aim of the policy is to allow the shoreline to evolve naturally, providing sediment from the eroded low cliffs to the down drift defences.

We do not think that the policy should change at this time and this would be implemented through a Do nothing approach. However, there may be a need for health and safety works to manage risks to the public from failing defences and risks will need to be monitored.

Continued maintenance of private defences would be allowed, but any modification to or replacement of the existing structures would require consent from Natural England due to the importance of habitats in the intertidal zone.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal change and channel movement.
- Continued inspection and maintenance of the existing structures (by private owners). Any modification to or replacement of the existing structures would also require consent from Natural England.
- Undertake an initial assessment of local or property level options for managing flood risk to the factory and highway near Wadhead Hill.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c12: Leven Estuary



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|--|---|------------------------|
| Highways England, Environment Agency, private landowners | 11c12.1 Leven viaduct to Haverthwaite (left bank) and Haverthwaite to Greenodd (right bank) | no |
| | 11c12.2 Greenodd to Barrow End Rocks (A590) | no |
| | 11c12.3.1 Old Railway Embankment | yes |
| | 11c12.3 Barrow End Rocks (A590) to Leven viaduct | yes |

This policy area covers the inner Leven estuary extending inland from the Leven viaduct, northwards to the normal tidal limit at Haverthwaite. It is situated landward of the Coast Protection Act boundary (Leven viaduct) so is not within South Lakeland District Council responsibility as Coast Protection Authority.

A key issue considered by the strategy is the flood risk to the A590 road and through to south Ulverston from part of 11c12.3, which is fronted by an old railway embankment.

There are also issues to the defences to the A590 in 11c12.2 due to the low water channel undermining the revetments that protect the road, however, Highways

England are monitoring the situation and have already a proposed solution to upgrade the defences.

The current Shoreline Management Plan policy for most of the estuary is Hold the line for the next 20 or so years, with Managed realignment in the medium term and No active intervention beyond this. The justification for this was that extensive defences are unlikely to be economically justifiable in the long term due to the limited assets at risk. The exception is at Greenodd, where defences directly protect the A590 and the policy is Hold the line.

 The following sections provide further details for each policy unit 

11c12.1 Leven viaduct to Haverthwaite (left bank) and Haverthwaite to Greenodd (right bank)

The current Shoreline Management Plan policy is Hold the line initially, moving to Managed realignment beyond this. We do not think that the policy should change at this time, but further studies need to be carried out before the change in policy should happen.

The proposed approach is Do minimum, involving reactive patch and repair of defences only and focussing on frontages where there is greater risk to assets. The works under this option would be low cost although due to the poor condition of the defence it is likely some defences will require maintenance on a regular basis.

Through ongoing discussions with Natural England, opportunities should also be sought to realign or remove defences to enable small to medium scale habitats creation through managed realignment and reducing the need to continue investment in flood defence maintenance.

We recommend a number of future activities, such as:

- Monitoring of intertidal change and channel movement - this baseline information can be used in any modelling of possible realignment schemes.
- Collection of defence information.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.
- Consultation with landowners and key organisations, including Natural England South Lakeland District Council, Highways England and the Environment Agency to consider the best approach to achieving sustainable long term flood risk management.

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

11c12.2 Greenodd to Barrow End Rocks (A590)

The current Shoreline Management Plan policy is Hold the line by managing flood and erosion risk by maintaining existing defences to an adequate standard.

Given the policy manages the risk to the A590 road, a key transport link for the region and diverting the A590 road would be significantly more expensive, we do not think that the policy should change at this time. However, improvements to existing defences may have an impact on the internationally and nationally designated habitats within the estuary and we may need to look at where we could compensate for the loss or damage to the area through managed realignment elsewhere.

Development of options to improve the existing protection of the A590 have already been undertaken in a previous study. The proposed scheme involves construction of a rock armour revetment and repairs to existing retaining wall and platform structure. The scheme is still pending planning permission and seeking funding from Highway England's future programme.

The recommended strategic approach is to implement the Shoreline Management Plan Hold the line policy through maintaining and upgrading the defences as necessary. In the short term the risk of erosion to A590 embankment should be monitored, implementing the proposed scheme to improve the defences when necessary.

This should consider opportunities for habitat creation through managed realignment in the adjacent units 11c12.1 or 11c12.3.1 to provide replacement habitat to mitigate impacts in 11c12.2 and also provide suitable set back flood risk management for the A590.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal and shoreline change.
- Collection of defence information.
- Seek necessary planning consents for A590 Greenodd Embankment Erosion scheme (Highways England).
- As part of possible future A590 Greenodd to Russland Pool scheme consider opportunities for managed realignment to manage flood risk to the A590 and take account of possible future widening and improvement of the alignment of the A590.
- Consider the potential to extend the protection in 11c12.2 to include the potential new policy unit 11c12.3.1 Old Railway Embankment to manage the flood risk to the A590 and south Ulverston.
- There may also be opportunities associated with onshore flood alleviation schemes that should be explored.

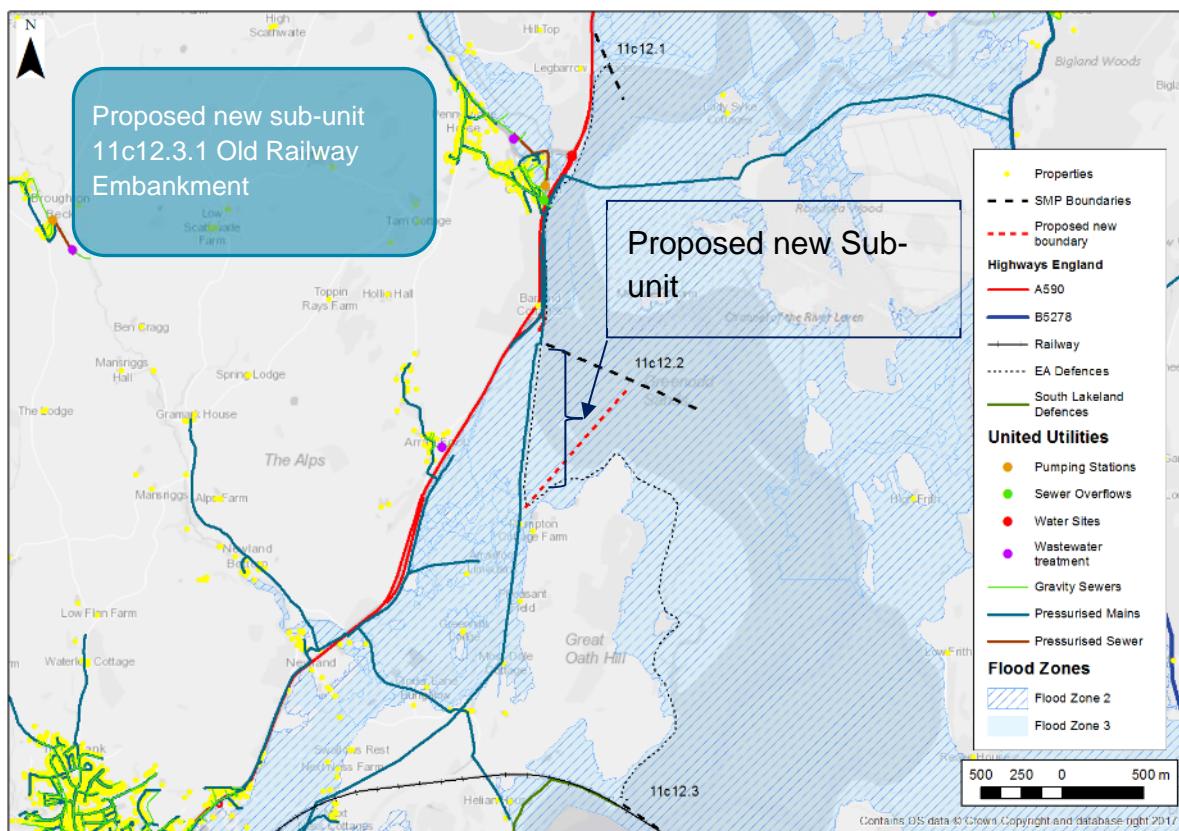
It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c12.3.1 Old Railway Embankment (priority unit)

A strategy recommendation is that there is a change in unit boundary between 11c12.2 and 11c12.3, with the introduction of a new policy unit (11c12.3.1). This is shown in the figure below:

There is a shared flood area for this frontage, which means that any tidal flooding through this frontage has the potential to affect a wider area (south Ulverston).

The current Shoreline Management Plan policy for this frontage is to Hold the line over the next 20 or so years, changing to Managed realignment beyond this. However, this would not address flood risk to the wider area, including Ulverston. We therefore also looked at long term Hold the line options for this frontage.



The preferred strategic approach is to Hold the line in the short term by maintaining and repairing the defences, effectively as present management, whilst undertaking further studies to develop the best longer term approach.

To provide long term protection, significant improvements to the existing defences or new defence construction will be required. This could either be along the existing defence line or involve construction of a new set back embankment, although this

would require further study to assess potential impacts on rest of estuary. Once constructed, this new set back defence would then be maintained to continue to minimise flood risk.

Introduction of this new policy unit will require a formal Shoreline Management Plan Change Process to be followed, which will include community and stakeholder consultation.

We recommend a number of future activities, such as:

- Consideration of frontage within ongoing EA scheme study 'South Ulverston Integrated Flood Risk Management Scheme' considering tidal flood risk reduction measures (short term potential fluvial / surface water schemes and tidal defences scheme needed in 20 or 30 years) and also the planned erosion management works in 11c12.2 (Highways England).
- Maintenance and repair of existing defences.
- Assessment of the potential impacts of a new set back embankment on the wider estuary.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c12.3 Barrow End Rocks (A590) to Leven viaduct (priority unit)

A strategy recommendation is for a change in unit boundary between 11c12.2 and 11c12.3, with the introduction of a new policy unit (11c12.3.1) as detailed above. This unit therefore only considers a revised unit stretching from the southern end of the old railway embankment to the Leven viaduct.

The current Shoreline Management Plan policy for this frontage is to Hold the line over the next 20 or so years, changing to Managed realignment beyond this.

Due to the proposed change in Shoreline Management Plan policy unit extent, there are limited assets at risk. As a result, a Do nothing approach is the preferred strategic approach for this frontage rather than the current policy of Hold the line in the short term. This would effectively bring the long term Shoreline Management Plan policy forward.

Continuing minimum interventions to defences (Do minimum), if funded by the landowner, would not be detrimental to the longer term aim and would therefore remain acceptable in the short term.

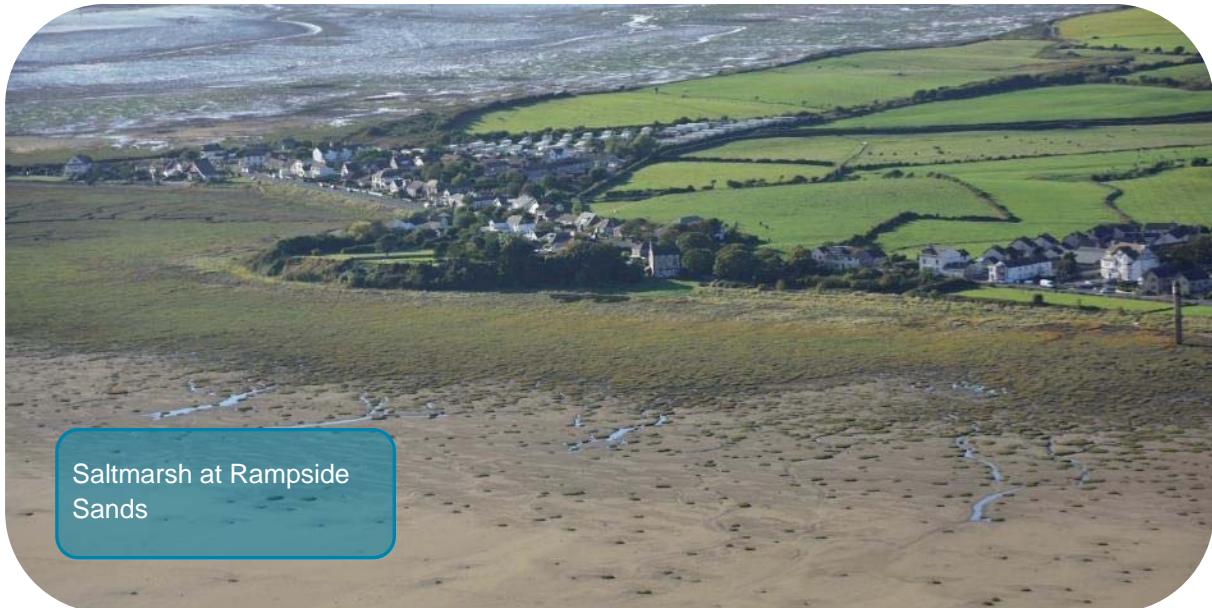
Due to the location and size of this unit, the potential for significant impacts elsewhere in the estuary is less than for other locations, but still needs further investigation.

We recommend a number of future activities, such as:

- As part of estuary-wide study looking at future gains and losses in marsh and flats for 11c12.1 consider impacts of managed realignment in 11c12.3 on tidal prism and erosion risks to Leven viaduct.
- Liaison with stakeholders on future management of private defences.

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

11c13: Bardsea to Piel Island



Saltmarsh at Rampside Sands

This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|---|-------------------------------|------------------------|
| South Lakeland District Council, Barrow Borough Council, Cumbria County Council, Highways England (Historical Railway Estate), Cumbria Wildlife Trust, private landowners | 11c13.1 Bardsea to Newbiggin | no |
| | 11c13.2 Newbiggin to Rampside | yes |
| | 11c13.3 Rampside | yes |
| | 11c13.4 Roa Island | yes |
| | 11c13.5 Piel Island | no |

The policy area covers the northern coast of Morecambe Bay between the Leven Estuary and Walney Island.

There are both coastal flood and erosion risks, with a key issue being the long term viability of the main coastal link road, A5087, as well as risks to isolated properties.

The following section provides further details for the policy unit

11c13.1 Bardsea to Newbiggin

The current Shoreline Management Plan policy is No active intervention.

Given there are limited assets at risk, we do not think that the policy should change. The proposed strategic approach is to implement the Shoreline Management Plan policy through a Do nothing approach for the majority of the frontage, with localised Hold the line at existing coastal defence locations to protect existing infrastructure and properties.

The need for short term erosion slowing defences at Moat Farm Scheduled Monument will need to be considered further with Historic England in order to allow time for recording.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline and intertidal change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary. Any modification to or replacement of the existing structures would also require consent from Natural England.
- Impacts of ongoing erosion on the Scheduled Monument at Moat Farm to be considered by Historic England and appropriate mitigation (such as recording before loss) to be identified and undertaken.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c13.2 Newbiggin to Rampside (priority unit)

The current Shoreline Management Plan policy is Hold the line in the short term, by maintaining existing defences, to allow time to investigate opportunities to set back defences in the medium term. There are formal defences along the whole of this section apart from a short length of coast at Leonard Scar, where the coast road is set back slightly further inland. There are a number of informal parking areas seaward of the road and a footpath runs along the back of the defences. The defences are maintained by Cumbria County Council as highway structures protecting the A5087. At the toe of the defences there is an intermittent and narrow upper shingle beach with a wide intertidal flat to seaward.

In the short term the preferred strategic approach is to Hold the line through proactive maintenance, which could be sufficient for up to 20 years. This will allow time for a longer term solution to be developed, including a funding plan.

In the future, to provide long term protection to the road in its current location, the existing defences would need to be improved through reinforcing with rock armour or concrete overlays and, depending on the rate of sea level rise, it may also be necessary to increase the crest level. Although the Shoreline Management Plan considered the possibility of realigning the road, the length of new A road required means this is unlikely to be more cost-effective than improving the current defences.

A feasible alternative would be the possibility of a small scale regulated tidal exchange scheme, to provide compensatory habitat. This would involve allowing controlled tidal flooding of land behind existing defences in a way that creates or restores habitat without increasing flood risk to the wider area. We need to investigate this further but it should be considered as a part of a longer term solution.

We recommend a number of future activities, such as:

- Monitoring of intertidal and shoreline change.
- Maintenance and repair of existing defences, with identification of works required for poor condition defences.
- Further studies into the potential for management realignment and regulated tidal exchange scheme, involving Natural England.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c13.3 Rampsde (priority unit)

The current Shoreline Management Plan policy is No active intervention with a change in the medium term to Hold the line to address increased risks from sea level rise.

The Rampsde frontage is currently protected from direct wave action by a wide fringing saltmarsh. There are existing coast protection defences along the whole frontage mostly consisting of sloping concrete revetments but there are no raised flood defences at present. Since the Shoreline Management Plan the Environment Agency have revised the flood risk maps and now show only a very small area of the village in the present day Flood Zone 2.

In the short to medium term, the shoreline is anticipated to remain sheltered by the fringing saltmarsh, the Foulney Embankment and Roa Island Causeway, therefore no works are likely to be needed apart from very minor repairs. Do nothing is therefore the preferred strategic approach, although risks will need to be monitored.

In the long term there may be a need to improve defences and raising existing defences is likely to be the most cost effective approach. This could be in the form of low wall slightly set back from the current defences to minimise impacting on designated sites, but a final decision will depend upon the future management of Roa Island, Roa Island Causeway and Foulney Embankment.

We recommend a number of future activities, such as:

- Monitoring of marsh and risk levels to coastal road and properties to enable future intervention to be assessed appropriately.
- Continued inspection and maintenance of the existing structures, with asset inspections extended to include Foulney Embankment, and minor maintenance of existing defences if required.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c13.4 Roa Island (priority unit)

The current Shoreline Management Plan policy for Roa Island and the causeway is to Hold the line.

Since the Shoreline Management Plan was completed, there has been a study to look at options along this frontage: the Roa Island Shorelink by Mott Macdonald (2010). This found that the present Foulney Embankment, which shelters Roa Island and Rampside Sands is already breaching in several places.

There are various options that would maintain the standard of defence into the long term, but further studies are required to better understand the how deterioration of the Foulney Embankment could affect important intertidal habitats in the area resulting in additional exposure and habitat changes. Therefore, in the short term, ongoing maintenance of the defences is required until a decision can be made on the best approach in the longer term. The preferred strategic approach is to continue to maintain defences with patch and repairs as necessary, essentially a Do minimum approach.

A whole coast approach is required to manage the flood and coastal risks, as the approach taken here will also depend upon the future management of the Foulney Embankment.

We recommend a number of future activities, such as:

- Continued inspection and maintenance of the existing structures, with asset inspections extended to include Foulney Embankment, and minor maintenance of existing defences if required.
- Further studies to confirm long-term approach to management of Foulney Embankment.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c13.5 Piel Island

The current Shoreline Management Plan policy is No active intervention although the policy allows for localised defences subject to consent, for example to manage risk to the castle ruins.

We do not think that the policy should change at this time. Therefore, the proposed strategic approach is to implement the Shoreline Management Plan policy through a Do nothing approach for majority of frontage, with localised hold the line at existing coastal defence locations to reduce erosion risk to the heritage assets, subject to funding.

We recommend a number of future activities, such as:

- Liaison between Barrow Borough Council and Historic England to review requirement for management of defences to Piel Castle Scheduled Monument.
- Monitoring of risk to historical assets, including buried archaeology, and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- Continued inspection and maintenance of the existing structures, including ferry jetty, with repairs and remedial works undertaken as necessary. Any modification to or replacement of the existing structures would also require consent from Natural England.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c14: Walney Island



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|---|------------------------|
| Barrow Council, Cumbria Country Council, private landowners | 11c14.1 South End Hawes to Biggar (east side) | no |
| | 11c14.2 Biggar to Lenny Hill (east side) | no |
| | 11c14.3 South End Hawes to Hare Hill (open coast) | no |
| | 11c14.4 Hare Hill to Hillock Whins | no |
| | 11c14.5 Hillock Whins to Nanny Point Scar | no |
| | 11c14.6 Nanny Point Scar to Mill Scar | no |
| | 11c14.7 Mill Scar to north of West Shore Park | no |
| | 11c14.8 North Walney | no |

An approved strategy for Walney Island is already in place (2014), as such all units have been defined as non priority for this Cumbria Coastal Strategy.

We have reviewed the findings of the Walney Island Strategy, taking account of changes since the strategy was completed, for example in coastal dynamics or defence condition, and feedback from consultation on this strategy.

The following sections provide further details for each strategy benefit area

Benefit Area 1 - North Walney (unit 1)

No ‘do something’ options were considered by Walney Island Strategy, due to the limited number of assets at risk.

The current strategy approach of Do nothing is considered appropriate and in accordance with the management principles of the national and international environmental designations for the site, as it promotes natural functioning of the coastal system.

However, the erosion risks to the former Vickers landfill site should be monitored as there has been some erosion along the frontage since the winter 2013/14 storms. If there is a significant risk of erosion breaching the site, the contamination risks will need to be reviewed and this may lead to a change in policy.

We recommend a number of future activities, such as:

- Continued monitoring of beach and shoreline change.
- Review monitoring data for the Vickers landfill site to determine any increased risk of the site breaching. This may identify a need for coastal defence or other measures to manage pollution risk.
- Monitoring of risks to the users of coastal paths and action taken as required to provide alternative routes.

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

Benefit Area 2 - West Shore Park (unit 2)

The Walney Island Strategy concluded that Shoreline Management Plan policy of Managed realignment was the preferred option. In line with this, new rock armour defence has been installed along the frontage. This defence is intended to be temporary and is due to be removed after 20 years. Continuing to maintain the defence here in the short term may, however, be affected by decisions along adjacent frontages to the south.

It is assumed that this defence will be maintained over the 20 year period. However, concerns raised regarding design may indicate a need for redesigning within the 20 years, subject to further monitoring.

We recommend a number of future activities, such as:

- Continued monitoring of the beach fronting defences and either side of the defences.
- Liaison between the Park owners and Barrow Borough Council to discuss future relocation of the Park, as set out by the Shoreline Management Plan and Walney Island Strategy. This is also likely to require discussion with Natural England as the surrounding area is designated for its environmental interests.

- Future review of coastal defences for the whole of 11c14.7 (Units 2 and 3) before the temporary defences at West Shore Park are removed in 20 years.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

Benefit Area 3 - Earnse Point to Walk Haw Scar (unit 3)

The Walney Island Strategy concluded that No active intervention was the preferred option, although it recognised that this would not preclude privately funded maintenance of existing ad-hoc defences, subject to the usual consents.

This is not in line with the Shoreline Management Plan preferred policy of Managed realignment, which was also the preferred environmental option, but the strategy concluded that maintenance or capital works could not be justified due to the few assets present.

Recent beach monitoring and asset inspection data indicate that although there are local fluctuations in beach level at the toe, the sloping revetment is generally in a fair state. This means that ongoing maintenance could be sufficient to sustain it for a number of years, beyond the No active intervention approach. Subject to funding being available, this could be a more viable short term option than simply allowing the current defence to fail, which could have an impact on both the viability of the fishtail groyne at Earnse Point and temporary defences at West Shore Park.

After a period of further monitoring and prior to the removal of the temporary defences at West Shore Park the justification for and impacts of the defences on the overall policy unit should be reviewed.

We recommend a number of future activities, such as:

- Continued monitoring of beach and shoreline change
- Consideration of potential funding streams to support continued maintenance of the existing defences, in line with plans for West Shore Park.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

Benefit Area 4 - Walk Haw Scar to Nanny Point Scar (unit 4)

The Walney Island Strategy calculated that there are no built assets at risk of erosion within the 100 year strategy lifetime due to slow rates of erosion so no 'do something' options were considered by Walney Island Strategy. Although the more recent monitoring data shows that during storms several metres of recession can occur, other years show little change.

Based on this data set, it is concluded that there has been no significant change in risk levels since the strategy, therefore the current strategy approach of Do nothing is considered appropriate, which is also the same as the Shoreline Management Plan policy.

We recommend a number of future activities, such as:

- Continued monitoring of beach and shoreline change.
- Management of vehicle access to foreshore to avoid damage to the natural beach ridge.

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

Benefit Area 5 - Nanny Point Scar to Hillock Whins (unit 5) and Biggar to Tummer Hill (unit 8)

Walney Island Strategy considered units 5 and 8 together, because of the linked flood area across Walney Island.

The Walney Island Strategy concluded that Do minimum was the preferred economic option for the west coast, Area 5. The Walney Strategy proposed that this should include creation of a rock stockpile to be used for maintaining and repairing the defences as and when failures occur. The recent asset inspection indicates that the current defences are already being overtapped, with retreat of the cliffs having occurred behind them. Therefore, for this option to remain viable, the storm damage that has occurred since the strategy needs to be repaired.

Along the Walney Channel coast, Unit 8, given the current condition of defences along this stretch and low exposure conditions, Do minimum is likely to sustain defences for some time. Any increase in risk and the acceptance of risk will need to be reviewed on a regular basis.

Along the Walney Channel coast Unit 8, given the current condition of defences along this stretch and low exposure conditions, Do minimum is likely to sustain defences for some time. Any increase in risk and the acceptance of risk will need to be reviewed on a regular basis.

We recommend a number of future activities, such as:

- Continued monitoring of beach and shoreline change.
- Detailed study into the risk of contamination from Bent Haw landfill and investigation into possible sources of funding if works are required here.

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

Benefit Area 6 - Hillock Whins to Hare Hill (unit 6)

The Walney Island Strategy concluded that Do minimum was the preferred economic option involving the reactive repair of the rock defences.

Since the Walney Island Strategy was approved, an area of the historic landfill has been subject to wash-out by the sea following the winter storms of 2013. There have been recent works along this frontage undertaken by Cumbria County Council include reprofiling and capping of the bund, as well as organising regular inspections and litter picks to reduce the risk of pollution and contamination along the frontage.

Cumbria County Council are currently seeking a longer-term permanent solution to the problem with the first phases of work due to be completed by winter 2018. The outcome is likely to require a revision of the preferred strategy option, reverting to the current Shoreline Management Plan policy for this frontage of Hold the line.

We recommend a number of future activities, such as:

- Continued monitoring of beach and defence condition.
- Separate study commissioned by Cumbria County Council to develop options to address the impacts of coastal erosion at former South Walney Landfill Site.
- Possible revision of Walney strategy option, but unlikely to require a change to Shoreline Management Plan policy.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

Benefit Area 7 - South Walney (unit 7)

The Walney Island Strategy concluded that No active intervention was the preferred option for Benefit Area 7, due to few assets in this benefit area. However, this would not preclude privately funded maintenance of existing ad-hoc defences, subject to the usual consents.

However, the strategy also stated “The Borough Council recognises the need to provide a resilient access to isolated properties at the southern end of the Island at times of high tides and surges. Local residents and businesses are working together on proposals to elevate the un-adopted road south of the caravan site and the Borough Council has indicated its support for this initiative.”

Given these measures, the current strategy approach of Do nothing is considered appropriate and in accordance with the management principles of the national and international environmental designations for the site.

We recommend a number of future activities, such as:

- Liaison between local residents and local business to ensure safe access to properties, with support from Barrow Borough Council.
- Repairs to embankments would be permitted but would require consent from Natural England given the significant environmental value of the intertidal and hinterland zones, so early discussions are recommended.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

Benefit Area 8 - Vickerstown and North Scale (unit 9)

The Walney Island Strategy concluded that No active intervention was the preferred option due to low flood damages. This would not, however, implement the Shoreline Management Plan preferred policy of Hold the line.

The main asset at risk from flooding would be The Promenade within Vickerstown, north of Jubilee Bridge, which is also a key link road to other communities on the Island. There is a risk that the road could become damaged and unpassable should the revetment start to fail. The defences along this section of highway are currently maintained by Cumbria County Council.

The Walney Island Strategy also noted that there is a highway scheme in progress to improve drainage on Cows Tarn Lane so that emergency access to North Scale can be maintained when the Promenade is flooded.

Given the risk of coastal flooding and erosion to the main link road and the Shoreline Management Plan Hold the line policy, the current No active intervention strategy is questioned. Continued maintenance is recommended and is likely to be sufficient to hold the line for some time, due to the low exposure conditions along the frontage. Temporary flood defences could be considered as an alternative to raising the crest level.

This would allow time for exploration of potential funding to support continued maintenance or future raising of the existing defences.

We recommend a number of future activities, such as:

- Consideration of potential funding streams to support continued maintenance or future raising of the existing defences.
- Inspection and maintenance of existing defences.
- Monitoring of foreshore levels and shoreline change.
- Investigation into surface water and United Utilities asset drainage issues including interaction with high tides and the issues with road subsidence.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c15: Walney Channel (mainland)



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|---|------------------------|
| Barrow Borough Council, Cumbria County Council, United Utilities, ABP, BAE, National Trust, private landowners | 11c15.1 Rampside to Westfield Point | no |
| | 11c15.2 Westfield Point to Hindpool (Barrow in Furness) | no |
| | 11c15.3 Hindpool to Lowsy Point | no |

The policy area extends along the mainland shoreline of Walney Channel, behind Walney Island. It covers the frontage from Rampside, at the outer mouth of Morecambe Bay, to Lowsy Point, which is the start of Sandscale Hawes dune system at the mouth of the Duddon Estuary.

The frontage along Walney Channel Mainland is largely industrial comprising a variety of hard defences, in varying condition. There is a short section of undefended coast in the south, approximately a kilometre in length, between Roa Island causeway and the start of defences for the gas terminal at Westfield Point.

North of the main industrial frontage, between Hindpool and Lowsy Point, the shoreline is mainly undefended.

The following sections provide further details for each policy unit

11c15.1 Rampside to Westfield Point

The current Shoreline Management Plan policy is No active intervention to allow the shoreline to continue to evolve under natural processes.

Based on (limited) data available, there appears to have been no significant changes in coastal risks since the Shoreline Management Plan and it supports the environmental designations for this frontage. Based on this, we do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

We recommend a number of future activities, such as:

- Continued monitoring of cliff and intertidal change.
- Defence inspections covering the revetment at West Point should monitor for signs of outflanking where it abuts the undefended cliffs. Any extension of the revetment here may require consent from Natural England due to the designation of the intertidal zone.
- Safe siting of the England Coast Path.

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

11c15.2 Westfield Point to Hindpool (Barrow in Furness)

The current Shoreline Management Plan policy is Hold the line by maintaining existing defences to an adequate standard.

Given the strategic importance of this area and continued investment since the Shoreline Management Plan, we do not think that the policy should change at this time.

The policy manages the risk to the A590 road, industrial sites including gas terminal, power station and dockyards. It is anticipated that the Waterfront development and investment in the BAE systems site and Port of Barrow would incorporate the necessary structures to ensure continued protection in these areas. Along these frontages defences will remain the responsibility of ABP and BAE.

Further north, there is a stretch of defence predominately the responsibility of Barrow Borough Council, whilst beyond Crook Scar, the defences are mainly the responsibility of Cumbria County Council. Many these defences will require attention in the short to medium term. In particular, south of the Jubilee Bridge is a short stretch of Barrow Borough Council maintained defence, which is recorded as being in poor condition (Barrow Borough Council, 2016). Failure of this defence could have consequences for the adjacent BAE defences and there are also commercial buildings within 15 m of the shoreline at this location.

We recommend a number of future activities, such as:

- Continued asset inspections to advise of any change in condition and issues to be addressed, with repairs and remedial works undertaken by the responsible operators as necessary.
- Liaison between BAE, ABP, Cumbria County Council and Barrow Borough Council to continue to develop future regeneration plans and ensure integrated approach to considering coastal erosion and flooding risks along adjacent frontages and to identify potential funding opportunities.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c15.3 Hindpool to Lowsy Point

The current Shoreline Management Plan policy is No active intervention to allow the shoreline to continue to evolve under natural processes.

Based on available (limited) information, there does not appear to have been significant changes to coastal risks and the current policy supports the environmental designations for this frontage. Based on this, we do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

However, there are private defences along this stretch (at Lowsy Point and north of Industrial Waste Recovery Site), which are not referred to within Shoreline Management Plan.

There may also be a need for additional works in future to address a potential contamination risk from the old cellophane factory and its waste tip.

At Lowsy Point, the short stretch of rock revetment appears to be providing limited protection to the collection of properties here. There is limited economic justification for maintaining defences here, but it is possible they could be privately funded. This would require consent from both Natural England and the National Trust. There does not appear to be a significant impact from the defences on adjacent shorelines, but further monitoring may be required.

We recommend a number of future activities, such as:

- Continued monitoring of coastal change, including along the face of the slag bank should also be considered, particularly given recent safety issues along the coastal edge path here.
- Discussion between Cumbria County Council, National Trust, Natural England, Barrow Borough Council and local property owners to consider further management of Lowsy Point. There may also need to be a slight amendment to the Shoreline Management Plan to cover any future works.

- There needs to be further investigation into short length of defences between Hindpool and Lowsy Point to determine ownership and purpose of defence.
- Further studies to assess the risk of contamination due to erosion of the old cellophane factory and associated waste tip.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16: Duddon Estuary



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|--|------------------------|
| South Lakeland District Council, Barrow Borough Council, Copeland Borough Council, Environment Agency, Network Rail, National Trust, United Utilities | 11c16.1 Lowsy Point to Askam Pier | no |
| | 11c16.2 Askam-in-Furness | no |
| | 11c16.3 Askam to Dunnerholme | yes |
| | 11c16.4 Dunnerholme to Sand Side | yes |
| | 11c16.5 Kirkby-in-Furness | yes |
| | 11c16.6 Herdhouse Moss | no |
| | 11c16.7 Galloper Pool to viaduct | no |
| | 11c16.8 Duddon Estuary (inner) | no |
| | 11c16.9 Millom Marshes | no |
| | 11c16.10 Millom Iron Works (industrial area) | yes |
| | 11c16.11 Hodbarrow Mains | yes |

The policy area covers the whole of the Duddon Estuary. Within the estuary there are relatively low flood and erosion risks to properties and land, partly due to the relatively high land elevations around the estuary margins and partly due to the small number of properties and industrial installations within the flood risk zone.

The railway runs within the flood plain around periphery of the estuary. The foreshore is currently eroding along the eastern bank as a result of the channel migrating landwards.

The Shoreline Management Plan identified opportunities to allow parts of the estuary seaward of the railway line to return to be a more natural shoreline, allowing future expansion of the intertidal flats and saltmarshes which are internationally important.

 The following sections provide further details for each policy unit 

11c16.1 Lowsy Point to Askam Pier

The current Shoreline Management Plan policy along this frontage is No active intervention. This would result in a naturally functioning sustainable coastline with potential for wetland habitat creation.

Although there is evidence of an ongoing trend of erosion along this frontage, due to limited assets at risk we do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

We recommend a number of future activities, such as:

- Continued monitoring of the frontage and changes in channel position, which could affect other areas.
- Continued liaison with the National Trust regarding management of the site, including access to environmentally sensitive areas.
- Should erosion accelerate, there may be a need to investigate potential contamination risk due to the former industrial use of the Roanhead area, but this is only likely to be required in the medium to long term.
- Safe siting of the England Coast Path.

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

11c16.2 Askam-in-Furness (including Askam Pier)

The current Shoreline Management Plan policy is Hold the line to manage the erosion risk by maintaining existing defences to an adequate standard. This will maintain the integrity of Askam as a coastal settlement.

Given the assets at risk within the town of Askam-in-Furness, which includes commercial and residential properties, we do not think that the policy should change at this time.

Along much of the frontage, in the short to medium term, works are unlikely to be required, depending upon future rates of erosion, as properties are generally set back from the shoreline. Defences at Marsh Lane will require continued maintenance and there may be a need to extend defences if outflanking becomes more of an issue. Any future works will depend upon availability of funding, so alternative sources will need to be sought.

We recommend a number of future activities, such as:

- Continued monitoring of the intertidal and shoreline change.
- Continued inspection and maintenance of Marsh Lane defences, with repairs and remedial works undertaken by Barrow Borough Council as necessary. As part of this, review outflanking risk at either end of the defence and plan for appropriate works as necessary. Any extension of defences will require consent from Natural England.
- Continued inspection and maintenance of Askam Pier, with repairs and remedial works undertaken as necessary.
- Development of a management plan to allow sufficient time for planning future works, including development of a funding plan. This will need to look at wider benefits and opportunities for co-funding.
- A study into the understanding the importance of Askam Pier in protecting Askam from increased flood risk to justify future maintenance as a defence element.
- Consider slight amendment to Shoreline Management Plan policy unit boundary between 11c16.2 and 11c16.3, to enable a more consistent approach to managing flood risk in the area.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.3 Askam to Dunnerholme (priority unit)

This unit runs from the southern boundary of Askam caravan park to the eastern tip of the limestone outcrop of Dunnerholme. The current Shoreline Management Plan policy unit is No active intervention to allow the shoreline to continue to evolve under natural processes.

Due to the limited economic justification the preferred strategic approach is to implement the current policy, through a Do nothing approach. If the risk to railway

line increases to become significant, there may become a need to improve the existing defence through constructing new revetment or walls along vulnerable stretches of railway embankment. This would require consent from Natural England as it has the potential to affect valuable intertidal habitat.

Erosion risks to the Askam-in-Furness caravan park may increase in the future, but options for adaptation in the longer term through relocation of this park should be considered, rather than construction of frontal defences.

We recommend a number of future activities, such as:

- Improve understanding of the level of risks to the railway and operations through monitoring of the beach and dune erosion.
- Development of an Asset Management Plan by Network Rail, setting out asset management and strategic aims for the railway along this frontage.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.4 Dunnerholme to Sand Side (priority unit)

The current Shoreline Management Plan policy is Hold the line to manage flood and erosion risk by maintaining the existing defences. This unit runs from the eastern tip of the limestone outcrop of Dunnerholme to the mouth of Kirkby Pool creek. The railway line runs parallel to the shoreline and is fronted by salt marsh: the width of fronting marsh reduces in width from south to north with little or no marsh north of Soutergate. Where the marsh is narrow, there is extensive rock protection in place to protect the railway from erosion.

There is a shared flood area for this frontage, which means that any tidal flooding through this frontage has the potential to affect a wider area.

The preferred strategic approach is to implement the Shoreline Management Plan policy of Hold the line through repairing or reinforcing erosion protection in the short term, whilst risks to the railway and its role in providing wider flood protection are investigated.

As building further defences could impact on important habitats across the intertidal area, we may need to look at where we could compensate for the loss or damage through managed realignment. This would involve a number of additional studies to look at what habitats we could create and also the effects on flood risk around the estuary.

We recommend a number of future activities, such as:

- Improve understanding of the level of risks to the railway and operations through monitoring of the beach and dune erosion.

- Development of an Asset Management Plan by Network Rail, setting out asset management and strategic aims for the railway along this frontage.
- Continued maintenance of repairs and renewals to existing defences (by Network Rail).
- Stakeholder agreement of longer term plan for mitigation or compensation for loss of habitat within extended defence footprint.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.5 Kirkby-in-Furness (priority unit)

The current Shoreline Management Plan policy is Hold the line to manage flood and erosion risk by maintaining the existing defences. The railway line runs parallel to the shoreline along the length of this policy unit and at some locations the width of marsh between the shoreline and the railway line is extremely narrow.

This frontage experiences changes in risk due to changes in position of the low water channel within the estuary.

The preferred strategic approach is to implement the Shoreline Management Plan policy of Hold the line to continue to protect the railway, which is also believed to provide some wider flood protection, including to Kirkby-in-Furness.

Maintaining existing defences at exposed locations, where the marsh is narrow or non-existent is unlikely to be effective into the long term, therefore a more sustainable solution would be to improve the defences or construct new embankments. The final decision will need to be made by Network Rail as they are responsible for the embankments within this unit. Both these options could impact on important habitats across the intertidal area and we may need to look at where we could compensate for the loss or damage to the area through managed realignment elsewhere.

We recommend a number of future activities, such as:

- Improve understanding of the level of risks to the railway and operations through monitoring of the beach and dune erosion.
- Development of an Asset Management Plan by Network Rail, setting out asset management and strategic aims for the railway along this frontage.
- Continued maintenance of repairs and renewals to existing defences (by Network Rail).
- Study to improve understanding of levels of risk to the railway and tidal flood risk to properties in Kirkby-in-Furness and to investigate the possibility of a joint scheme.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.6 Herd House Moss

The current Shoreline Management Plan policy is No active intervention to allow the shoreline to continue to evolve under natural processes. In the medium term (beyond 20 years), the Shoreline Management Plan suggested that localised flood protection should be considered for isolated properties at flood risk.

There are limited assets at risk and as such we do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

However, Network Rail may wish to reinforce their railway embankment in the future once the existing wall fails to maintain the integrity of the line. There are also potential habitat creation opportunities that should be explored as part of any future works, such as a regulated tidal exchange scheme. This would involve allowing controlled tidal flooding of land behind existing defences in a way that creates or restores habitat without increasing flood risk to the wider area.

We recommend a number of future activities, such as:

- Continued monitoring of the frontage and changes in channel position, which could affect other areas.
- Collection of defence information.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary by Network Railway.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources and suitable options.
- Additional studies to explore the potential for habitat creation through a regulated tidal exchange approach.
- Wider scale impacts of any realignment would need to be assessed prior to any scheme and would need to consider actions elsewhere within the estuary.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.7 Galloper Pool to viaduct

The current Shoreline Management Plan policy is Hold the line to manage risk to the railway line and Foxfield by maintaining existing defences.

Due to the intention to continually invest in the railway, we do not think that the policy should change at this time and the proposed strategic approach is to implement the Shoreline Management Plan policy by continuing to maintain the defences to the railway.

Network Rail may wish to reinforce or raise their railway embankment in the future once the existing wall fails to maintain the integrity of the line. As part of this, opportunities for regulated tidal exchange could be considered. This would involve allowing controlled tidal flooding of land behind existing defences in a way that creates or restores habitat without increasing flood risk to the wider area. There may also be potential for a joint scheme to reduce risk to properties in Foxfield as well as railway.

However, any future works could impact on important habitats across the intertidal area and we may need to look at where we could compensate for the loss or damage through managed realignment elsewhere.

We recommend a number of future activities, such as:

- Monitoring of the frontage – this baseline information will be used in any future modelling of possible managed realignment schemes.
- Collection of defence information data.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary by Network Railway.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources and suitable options.
- Additional studies to explore the potential for habitat creation through a regulated tidal exchange approach.
- Investigate the potential for a joint scheme to reduce risk to properties in Foxfield and the railway.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.8 Duddon Estuary (both banks upstream of viaduct and right bank south to Green Road Station)

The current Shoreline Management Plan policy is Hold the line for the next 20 or so years, changing to Managed realignment beyond this. This would include localised set back defences to manage risk to the A595 road if required.

We do not think that the policy should change at this time as Managed realignment in the longer term will enhance the natural environment whilst providing protection to the railway line. There is also potential to offset loss or damage to intertidal habitats elsewhere within the estuary, where we need to Hold the line.

However, there is a need to improve understanding of the potential impacts. This will require more detailed studies including modelling of flows and sediment transport.

Therefore, in the short term, the proposed strategic approach is to implement the Shoreline Management Plan policy of Hold the line through a Do minimum, risk-based approach. This will involve reactive patch and repair, focussing on frontages with greater risk to assets. This will allow time for the detailed investigations needed to develop a longer term solution and consider suitable managed realignment locations.

We recommend a number of future activities, such as:

- Monitoring of the frontage – this baseline information will be used in any modelling of possible realignment schemes.
- Collection of defence information.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future realignment.
- Detailed studies and consultation to investigate possible managed realignment sites, through considering potential effects on the wider environment of the Duddon Estuary and adjacent infrastructure such as the railway, viaduct and A595.
- Safe siting of the England Coast Path and any future estuarine cycleway.

11c16.9 Millom Marshes

The current Shoreline Management Plan policy is Hold the line for the next 20 or so years, changing to Managed realignment beyond this. The intention was that existing embankments would not be replaced at the end of their life, but instead new set back embankments should be constructed, which would continue to manage risks to the railway.

We do not think that the policy should change at this time as Managed realignment in the longer term will enhance the natural environment whilst providing protection to

the railway line. There is also potential to offset loss or damage elsewhere within the estuary, where we need to Hold the line.

However, there is a need to improve understanding of the potential impacts. This will require more detailed studies including modelling of flows and sediment transport.

Therefore, in the short term, the proposed strategic approach is to implement the Shoreline Management Plan policy of Hold the line through a Do minimum, risk-based approach. This will involve reactive patch and repair, focussing on frontages with greater risk to assets. This will allow time for the detailed investigations needed to develop a longer term solution and consider suitable managed realignment locations.

We recommend a number of future activities, such as:

- Continued monitoring of the frontage to appraise changes in risk – this baseline information will also be used in any modelling of possible realignment schemes.
- Collection of defence information.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary by Network Railway.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future realignment.
- Detailed studies and consultation to investigate possible managed realignment sites, through considering potential effects on the wider environment of the Duddon Estuary and adjacent infrastructure such as the railway, viaduct and A595.
- Safe siting of the England Coast Path and any future estuarine cycleway.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.10 Red Hills - Millom Iron Works (Industrial area) (priority unit)

The current Shoreline Management Plan policy is No Active Intervention. This unit covers the estuary frontage seaward of Millom Iron Works and adjacent to Salthouse Pool. The area comprises low lying land fronted by saltmarsh and a promontory consisting of blast furnace slag. Erosion here would affect a limited number of buildings along the frontage including the Iron Works.

There are currently no formal defences along this frontage although the disused railway embankment along the north-west extent of the policy unit provides an

informal tidal flood defence to Millom. A breach through this embankment could also potentially affect a wide area of south Millom.

Due to the varying risk along this unit, we propose a new Shoreline Management Plan unit should be created (11c16.10.1), which would incorporate the disused railway embankment. Here the recommended approach would be to Do minimum, which would involve monitoring risks but intervening when necessary to repair the embankment.

For the remainder of 11c16.10, where risks are lower, the preferred approach is to implement the Shoreline Management Plan policy of No active intervention through a Do nothing approach. It is recognised, however, that private developments planned at Port Millom, could affect this.

We recommend a number of future activities, such as:

- Creation of a new Shoreline Management Plan policy unit, which will need to follow a formal Shoreline Management Plan Policy Change process.
- A Millom and Haverigg flood risk study is on-going, which aims to review all sources of flood risk and provide better definition of the extent of flood risk to Millom. The study will include tidal flooding from 11c16.10, 11c16.11, 11d1.1 and 11d1.2. This may identify that works are needed earlier.
- Investigate the potential contamination risk in remainder of 11c16.10.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11c16.11 Hodbarrow Mains (priority unit)

The Shoreline Management Plan policy here is No Active Intervention in the short term, with Management Realignment through the construction of set back flood embankments to manage flood risk to flood assets in Millom when flood risk justifies beyond this.

There are currently no formal defences along this frontage, but due to low areas of land there is a possible flood route through to south Millom. This risk of flooding may become more significant in the future with future sea level rise.

We still need to understand this risk better before we can decide on a suitable long term solution. Therefore, in the short term the preferred strategic approach is to implement the Shoreline Management Plan policy of no active intervention, through a Do nothing approach but to undertake studies within the next 10 years to improve understanding of flood links to the wider south Millom area.

These studies may identify a need to construct set back flood embankments to manage flood risk to properties in Millom.

We recommend a number of future activities, such as:

- Coastal flood risk modelling study to confirm extent of flood risk to south Millom and the assets at risk (currently on-going).
- Improve understanding of the level of risks through monitoring of the beach and backshore erosion.

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

11d1: Hodbarrow Point to Selker



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|---|------------------------|
| Copeland Borough Council, private landowners | 11d1.1 Hodbarrow Point to Haverigg | yes |
| | 11d1.2 Haverigg | no |
| | 11d1.3 Haverigg to Hartrees Hill | no |
| | 11d1.4 Silecroft (Hartrees Hill) | no |
| | 11d1.5 Hartrees Hill to Selker | no |

The policy area extends between Haverigg in the south and Selker Point, near Bootle. The strategy has considered flood risk to Millom and Haverigg and erosion risks further north.

The frontage has high environmental value with international and national designations covering Hodbarrow Lagoon as well as the sand dunes, intertidal and offshore areas.

 The following section provides further details for each policy unit 

11d1.1 Hodbarrow Point to Haverigg (priority unit)

The current Shoreline Management Plan policy is Hold the line for the short term but moving to Managed realignment beyond this.

This frontage comprises the man-made Haverigg Outer Barrier, which was constructed between 1900 and 1905 as a dam to prevent the inflow of the sea onto the land that is prone to subsidence from historical mining. The lagoon behind the barrier is a result of mining work and now includes a nature reserve and holiday village lake. Defences around the lagoon also protect a wider flood area that includes south Millom.

Although the Shoreline Management Plan proposes a change from hold the line to managed realignment in the medium term, studies to support this have not yet been undertaken.

The defences are in good condition and may be sustainable beyond 50 years with only minor maintenance, through a Do Minimum approach. We therefore think that the need for realignment to a set back defence could potentially be deferred into the 50 to 100 year epoch.

However during this period, the recommended study should be undertaken, involving consultation with local authorities, landowners, Natural England and RSPB to consider feasible future options.

The recommended strategic approach is therefore to continue maintenance of defences (Do minimum) in the short and medium term and to monitor ongoing condition of the defences.

We recommend a number of future activities, such as:

- Inclusion of frontage in a wider south Millom coastal flood risk study to review all sources of flood and erosion risk to Millom and Haverigg (currently on-going).
- Continued monitoring of intertidal and beach change.
- Continued inspection and private maintenance of the existing structures, with repairs and remedial works undertaken as necessary.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d1.2 Haverigg

The current Shoreline Management Plan policy is Hold the line to manage flood risk to the village of Haverigg, associated infrastructure and wider flood risk area by maintaining existing defences.

We do not think that the policy should change at this time, but future works will depend upon available funding.

Improvements to the defences may be needed in the future, such as raising the crest or modifying the defence to address any outflanking. The timing and justification for possible future works should be considered in conjunction with reviewing the standard of protection required as part of a wider Haverigg and Millom flood risk modelling study.

We recommend a number of future activities, such as:

- Inclusion of frontage in a wider south Millom coastal flood risk study to review all sources of flood and erosion risk to Millom and Haverigg (currently ongoing).
- Continued monitoring of intertidal and beach change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Safe siting of the England Coast Path.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

11d1.3 Haverigg to Hartrees Hill

The current Shoreline Management Plan policy is No active intervention, which allows a continuation of natural processes. We do not think that the policy should change at this time as it supports the international and national conservation designations and there are limited assets at risk.

The preferred strategic approach is to implement the Shoreline Management Plan policy through Do nothing, allowing natural coastal processes to continue, with the dune systems providing natural defence to the low lying area.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and dunes.
- Safe siting of the England Coast Path, the route of which is still to be decided.

11d1.4 Silecroft (Hartrees Hill)

The current Shoreline Management Plan policy is Hold the line, which allows management of erosion risk to the car park, beach access and properties. The Shoreline Management Plan concluded that these private defences were not significantly reducing the sediment supply.

As the policy for adjacent units (11d1.3 Haverigg to Hartrees Hill and 11d1.5 Hartrees Hill to Selker) is No active intervention, outflanking of these defences may be an issue in the future.

We do not think that the policy should change at this time as the private defences provide protection to properties in Hartrees Hill, Silecroft. However, this is dependent on future rates of erosion. If erosion accelerates, it may be necessary to consider moving the defences back, should the surrounding areas recede so much the Silecroft becomes a headland and could potentially restrict longshore drift.

There is also some question over who will be responsible for defences in front of the new coastal development at Raywick Hole, where a new car park is being built to accommodate an anticipated increase in visitors to the area.

The preferred strategic approach is therefore to implement the Shoreline Management Plan policy of Hold the line, through repair and maintenance to the existing private defences, while sustainable, and subject to defences causing no adverse effects on sediment movement or coastal processes.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and dunes.
- Safe siting of the England Coast Path, the route of which is still to be decided.
- Determining future defence requirements for the car park and identification of funding for this.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d1.5 Hartrees Hill to Selker

The current Shoreline Management Plan policy is No active intervention. This allows a continuation of natural processes conducive to the international and national conservation designations located both to the north and south. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach. However, this would not deter local management measures to manage tide-locking at Annaside spit.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and dunes, with a focus on changes to the Annaside spit.
- Monitoring of flood risk relating to natural changes to Annaside spit and possible consideration of management measures to manage the risk. As this would impact on the SSSI site, consent will be required from Natural England and early consultation is recommended.

- Safe siting of the England Coast Path, the route of which is still to be decided.

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

11d2: Selker to Eskmeals



This policy area includes the following policy unit:

| Responsibilities | Policy Unit | Is it a priority unit? |
|---|---------------------------------------|------------------------|
| Copeland Borough Council, MoD (QinetiQ) – Eskmeals Range, Cumbria County Council (C4027), Lake District National Park Authority | 11d2.1 Selker to Stubb Place | no |
| | 11d2.2 Stubb Place and Eskmeals Dunes | yes |

This policy area is located to the south of the Ravenglass Estuary. The coast is characterised by low till cliffs which diminish in height towards the north and are replaced by sand dunes, forming the Eskmeals dune system.

A key issue is the risk of coastal erosion and flooding due to overtopping, potentially resulting in loss of access (via C4027 road) to Eskmeals MoD Range, which is managed by QinetiQ.

11d2.1 Selker to Stubb Place

The current Shoreline Management Plan policy is No active intervention to allow a continuation of natural processes, providing sediment to local and updrift beaches.

We do not think that the policy should change at this time and this would be implemented through a Do nothing approach. However, continued erosion of the cliffs is anticipated, which could impact on farmsteads and therefore effect livelihoods of the agricultural community. There is also a risk that the access track at Selker could be lost, and so may need rerouting prior to loss of the farm. Plans for relocating assets would need to consider impacts on the landscape.

We recommend a number of future activities, such as:

- Continued monitoring of the frontage.
- Liaison between Copeland Borough Council, LNDPA and landowners to facilitate relocation of assets and the access track and to minimise risk to life due to ongoing coastal cliff erosion, through advising on changes in risk.

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

11d2.2 Stubb Place and Eskmeals Dunes (priority unit)

The current Shoreline Management Plan policy is for Managed realignment with short term measures to allow continued use of road at Stubb Place whilst medium or long term Managed realignment adaptation approach is investigated.

However, there are three distinct areas, in terms of their management approach: (1) Stubb Place, where management of risks to the road in the short-term is the key concern, (2) Eskmeals MoD range, where QinetiQ reactively manage the shingle ridge and (3) natural unmanaged frontage of Eskmeals Dunes, to the north of the MoD site. These are discussed in separate sections below.

Stubb Place

The key risks here are from both erosion and flooding due to overtopping, which could result in loss of access (via C4027 road) to Eskmeals Range and local properties. This is currently the only viable access to the MoD site as the alternative route road passes under Eskmeals viaduct and has height, width and tide restrictions. The Eskmeals site is understood to be a critical MoD testing facility and is also a defined COMAH (Control of Major Accident Hazards) site for which emergency access is critical.

In response to the risk to the access road, various temporary defences have been built to attempt to slow or halt erosion along the Stubb Place frontage. The long term preferred strategic approach is relocation of the road and removal or abandonment of defences. However, plans and funding are not yet in place to enable this and therefore in the short-term the proposed approach is to secure the ongoing operation of the road whilst longer term realignment options are developed.

The current state of the defences means that works will be required to improve or replace the existing structures. The most likely solution will involve rebuilding and modifying the defences using a combination of Pendine blocks and rock. Whether it is possible to raise the level of the defences is uncertain at this stage, so there may be continued risk of overtopping during storms and road closures may be required. Opportunity should be sought at design stage to improve beach access for users. The new access road could also impact on landscape.

We recommend a number of future activities, such as:

- Cumbria County Council Highways to work with stakeholders to implement short term works to temporarily retain the road whilst a longer term approach is developed.
- Monitoring of short term defences and coastal change.
- Monitoring of highway condition and safe usage and better communication of risk to road users.
- Development of a longer term option for relocating the road, involving engagement with all stakeholders to facilitate relocation of other assets.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

Eskmeals MoD range

QinetiQ, on behalf of the MoD, currently undertake beach management activities along the shingle ridge post storms. The preferred strategic approach is for a more proactive approach to management, based on monitoring of change along the frontage. This would benefit the Eskmeals Range, which is recognised as a strategically important site, through reducing the risk of erosion and flooding, and would help ensure there are no impacts on adjacent designated sites. It would also reduce the risk of potential contamination from the site.

We recommend a number of future activities, such as:

- QinetiQ to develop management options and beach management plan to proactively manage the frontage to ensure risks to the site are minimised
- Continued monitoring of shoreline and dune change.
- Liaison between QinetiQ and MoD, Natural England and LDNPA regarding future management of Eskmeals Range frontage to ensure impacts on adjacent designated sites are considered appropriately
- Liaison between QinetiQ and MoD, Copeland Borough Council, Cumbria County Council (highways), LDNPA and landowners to facilitate continued access to the Eskmeals Range (see section 2.3 above) and reach a decision regarding management of the Stubb Point frontage.

Eskmeals Dunes

The preferred strategic approach is to allow the area to function as naturally as possible, through implementing Do nothing (no new defences).

A key future activity is:

Monitor beach and dune change, with specific monitoring to assess impact on any works to the south.

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

11d3: Ravenglass Estuary Complex



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|-------------------------------------|------------------------|
| Environment Agency, Network Rail, Highway Authority, United Utilities, private landowners, Lake District National Park Authority | 11d3.1 Eskmeals Dunes to Ravenglass | no |
| | 11d3.2 Ravenglass | no |
| | 11d3.3 Ravenglass to Drigg Point | no |

The policy area covers the Ravenglass Estuary Complex including Esk, Mite and Irt River estuaries.

The frontage lies within the Lake District National Park and World Heritage Site and the entire Ravenglass Estuary Complex is designated under land and marine based environmental designations.

The following section provides further details for each policy unit

11d3.1 Eskmeals Dunes to Ravenglass including River Esk to Muncaster Bridge Shoreline Management Plan boundary

The current Shoreline Management Plan policy along this frontage is No active intervention. There are limited assets at risk and this policy will maintain natural coastal processes supporting national and international designated sites within the policy unit. This area lies within the Frontiers of the Roman Empire WHS.

There have been no significant changes to coastal risks since the Shoreline Management Plan and we do not think that the policy should change at this time. The preferred strategic approach is to implement the policy of No active intervention, through introducing no new defences, but permitting localised maintenance works to reduce risk to the viaduct, mainline railway and to Ravenglass local community, subject to approval from Natural England.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal and shoreline change.
- Continued monitoring of Network Rail defence assets as current and longer term flood risk to the railway is not well understood.
- It is assumed that Network Rail will provide ongoing maintenance of their embankment. Therefore, liaison between Network Rail, Natural England and LDNPA to discuss any future works to maintain the defences to the railway are required.
- Inclusion of the southern end of this unit in an Asset Management Plan for Network Rail, to ensure a strategic approach to managing risks along the wider frontage.
- Monitoring and warning of flood risk to A595 at Muncaster Bridge.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d3.2 Ravenglass

The current Shoreline Management Plan policy is Hold the line which will maintain the integrity of Ravenglass, associated infrastructure, including the U4057, and amenity and tourism value.

There have been no significant changes to coastal risks since the Shoreline Management Plan and we do not think that the policy should change at this time, but any works will be subject to funding.

The preferred strategic approach is to implement the existing policy of Hold the line, through proactive maintenance of existing defences in the short term, although ownership and responsibility needs to be resolved.

In the longer term, works may be required to address increasing risks resulting from sea level rise. Due to environmental designation of the shoreline and the potential for reactivation of offshore contaminated sediments, the recommendation would be to consider measures that minimise any increase in footprint, such as modification of existing structures. This would, however, require more detailed understanding of current defence design and options need further investigation at scheme stage.

If there is a risk of possible impact on important habitats across the intertidal area, we may need to look at where we could compensate for the loss or damage to the area through managed realignment elsewhere.

We recommend a number of future activities, such as:

- Continued monitoring of intertidal and shoreline change.
- Continued inspection and maintenance of defences, with repairs and remedial works undertaken as necessary.
- Appraisal of wider benefits that can be attributed to this policy area and development of a funding strategy if future works are likely.
- Any changes to the existing structures would require consent from Natural England due to the designation of the intertidal zone. Consultation with Historic England and LDNPA would also be required, due to potential impacts on heritage and landscape features in the area.
- Monitor risk to U4057 and ensure safety of road users.
- Consider supporting property level protection schemes to adapt to increasing flood risk at Ravenglass.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

11d3.3 Ravenglass to Drigg Point including River Mite to Muncaster Mill and River Irt to Drigg Holme

The current Shoreline Management Plan policy is No active intervention. There have been no significant changes to coastal risks since the Shoreline Management Plan and we do not think that the policy should change at this time.

The preferred strategic approach is to implement the policy of No active intervention, through introducing no new defences, but permitting localised maintenance works to reduce risk to the viaduct and mainline railway, subject to approval from Natural England.

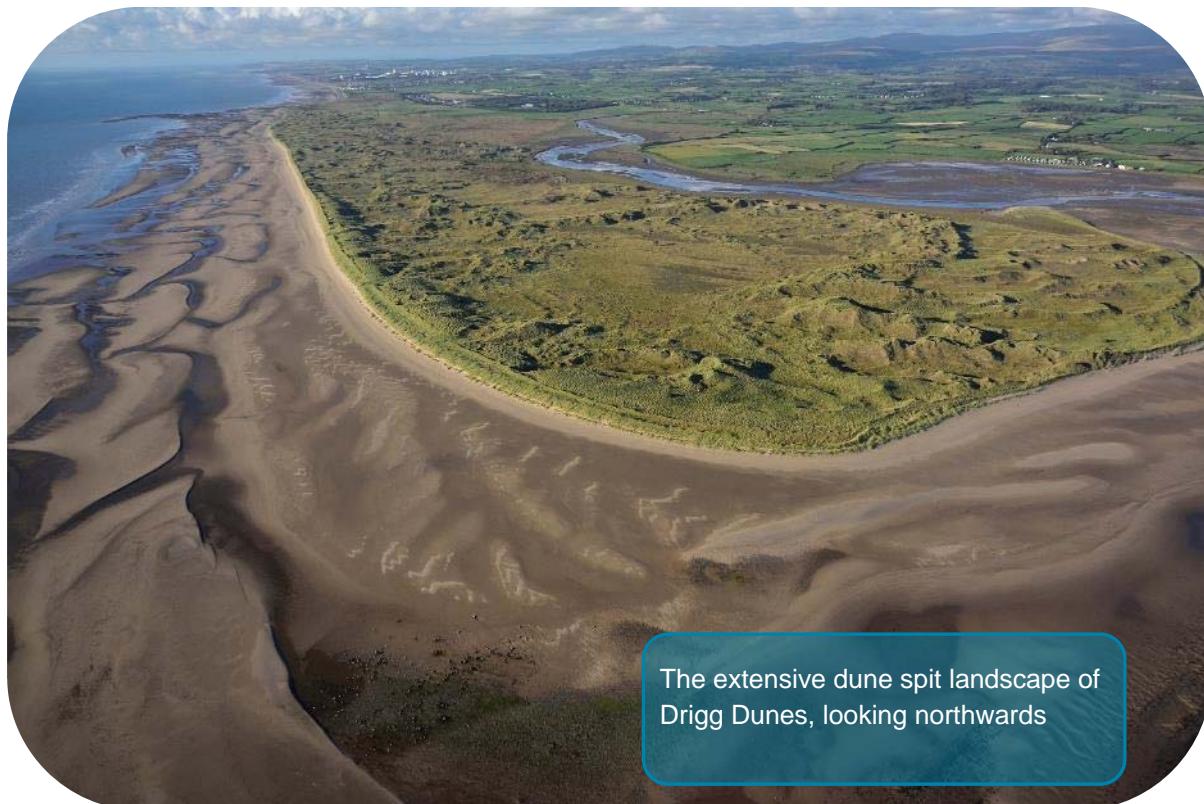
We recommend a number of future activities, such as:

- Continued monitoring of intertidal and shoreline change.

- Confirm ownership of defence at Saltcoats. This is thought to be in reasonable condition and likely to require only minor maintenance in the future.
- Monitoring of the risk to the earth embankment to the south of Saltcoats - this defence is currently protected by marsh, but should this start to erode (as has occurred along the Saltcoats frontage) this would become more exposed to tidal currents. As well as there being United Utility assets along this bank, this is also the route of the England Coast Path.

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

11d4: Drigg Point to Seascale



This policy area includes the following policy unit:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--------------------------|--------------------------------|------------------------|
| Copeland Borough Council | 11d4.1 Drigg Point to Seascale | no |

This policy area covers the shoreline between Drigg Point at the mouth of the Ravenglass Estuary and the southern limit of the village of Seascale.

The Drigg Low Level Waste Repository (LLWR) is located inland of this frontage. The most recent published review of coastal erosion risk concluded that there was no significant erosion risk to the site within the strategy lifetime (100 years) with timescales for the start of erosion of the disposal area estimated to range from a few hundred to a few thousand years.

The following section provides further details for the policy unit

11d4.1 Drigg Point to Seascale

The current Shoreline Management Plan policy along this frontage is No active intervention. Continued erosion is supportive of the environmental designations and there is no economic justification for intervention.

There have been no significant changes to coastal risks since the Shoreline Management Plan and we do not think that the policy should change at this time. The preferred strategic approach is to implement the current Shoreline Management Plan policy through a Do nothing approach, with ongoing monitoring of risk to the Low Level Waste Repository (LLWR) at Drigg as part of the Environmental Safety Case for the site.

We recommend a number of future activities, such as:

- Continued monitoring of foreshore and dune change. This should also consider evidence of impacts of any works undertaken along the adjacent frontage of Seascale.
- Through liaison with LLWR Ltd, ensure coastal monitoring information collated as part of the environmental permit for the LLWR site is incorporated into future appraisals of coastal change.
- If societal changes occur that lead to a desire to actively defend the LLWR national asset, then this will be incorporated within any future strategy or Shoreline Management Plan review.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5: Seascle to St Bees



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|--|---|------------------------|
| Copeland Borough Council, Cumbria County Council (highways), Nuclear Decommissioning Authority, Network Rail, private landowners | 11d5.1 Seascle | yes |
| | 11d5.2 Seascle to Sellafield | yes |
| | 11d5.3 Sellafield | yes |
| | 11d5.4 Sellafield to Braystones | yes |
| | 11d5.5 Braystones, Nethertown and Coulerton | yes |
| | 11d5.6 Coulerton to Sea Mill | yes |
| | 11d5.7 Sea Mill to Pow Beck | yes |

This policy area includes the villages and smaller communities of Seascle, Braystones, Nethertown and Coulerton, as well as the Sellafield nuclear site and the adjacent Moorside site.

The Cumbrian Coast Line runs along the top of, or in front of, the till cliffs between Sellafield and St Bees (11d5.4 to 11d5.7), which are prone to erosion. There is a variety of formal and informal coastal defences.

Seaward of the railway line there are several permanent and seasonally occupied beach dwellings which have been constructed on the crest of the gravel beach and rely on the beach for protection from flooding and erosion.

 The following sections provide further details for each policy unit 

11d5.1 Seascale (priority unit)

Seascale is a small seaside resort, which originally developed in Victorian times when the Furness Railway was constructed. A series of short sections of defences consisting of gabions and concrete revetments currently protect the frontage. The cliffs to the south are undefended and railway embankments provide the main line of defence in the north of the village.

In the short term the current Shoreline Management Plan policy is to Hold the line. However, a Do minimum approach to this is all that can be economically justified at this time.

This approach would not sustain protection for many years and so further investigations are needed to better identify the risks related to defence failure and value and timing of economic impacts related to the road and railway so that alternative options can be justified and funding sought. Ongoing monitoring can identify key risk areas for repair and allow a programme of works to be developed to ensure the defence is maintained.

In the longer term, more extensive works are likely to be required to ensure continued protection, such as replacing existing defences with new revetments, but again this would require funding to be sought.

We recommend a number of future activities, such as:

- Continued monitoring of beach and dune change.
- Monitoring of defence condition to inform residual risk with repairs and maintenance undertaken as required.
- Liaison with United Utilities to assess constraints relative to rising mains and outfalls on the beach and with the Nuclear Decommissioning Authority (NDA), who own the foreshore.
- Development of a funding strategy for defence maintenance and a joint scheme approach to future improvements, which should consider potential investment from stakeholders including Copeland BC, Network Rail, Cumbria County Council Highways, the Nuclear Decommissioning Authority (NDA), and United Utilities.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5.2 Seascale to Sellafield (priority unit)

The current Shoreline Management Plan management policy is No active intervention with works only to be carried out if the railway is at risk.

Between Seascale and Sellafield, the beach is backed by low sand dunes and the railway embankment. There are no formal defences along this frontage, but the railway is currently at low risk, due to the general stability of the dunes.

There is however a risk of occasional storm damage which could be addressed in the short term through low tech measures such as rock toe work. It is recommended that rather than these works being carried out in an ad-hoc manner, an Asset Management Plan is developed for this frontage (as part of a larger plan for the whole policy area 11d5). This plan should also ensure that that damage to the natural environment is mitigated or minimised.

In the longer term, should the level of erosion risk increase, more substantial measures may need to be required to ensure the long term protection of the railway in its current location. The approach in this unit should be developed in conjunction with the other frontages within the policy area to ensure a strategic solution is developed.

To support this, a change in Shoreline Management Plan policy to Hold the line is recommended, which would also be consistent with adjacent frontages (11d5.1 and 11d5.3).

We recommend a number of future activities, such as:

- Improved understanding of level of risk to the railway through continued monitoring of the beach and cliffs (throughout 11d5).
- Development of an Asset Management Plan for the entire 11d5 frontage, setting out strategic aims. This should involve liaison with Natural England and other key stakeholders along the frontage should also be involved to consider multi-benefits of any longer term solution.
- Consider the need for a change in policy to support future shoreline management actions and to be consistent with adjacent frontages. This would need to follow a formal Shoreline Management Plan Policy Change process.
- Monitoring of risk to the cycling route and further consideration of future route viability in line with developing long term solutions.

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

more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5.3 Sellafield (priority unit)

The current Shoreline Management Policy is to Hold the line by maintaining linear revetment and rock armour defences and replacing with larger structures when necessary.

A rock revetment, partially protected by the Ehen spit, provides protection to the railway and the Sellafield nuclear site which lies immediately adjacent to the coastline.

Given the critical infrastructure and high contamination risk associated with the Sellafield site, no change in policy is recommended. The current defences are in a good state, so the recommended strategic approach is to implement the Shoreline Management Plan policy, in the short and medium term through proactive repair and maintenance of the existing rock revetment.

In the long term, there may be a need to improve defences, with construction of a new rock revetment the preferred approach. The timing of this may depend on several factors, in particular any future development of the Moorside site (located in unit 11d5.4) and long term plans for the Cumbrian Coast Line railway (which in turn may be affected by changes in demand resulting from decommissioning of Sellafield).

We recommend a number of future activities, such as:

- Improved understanding of level of risk to the railway through continued monitoring of the beach and cliffs (this should be undertaken throughout 11d5) – this should incorporate any monitoring undertaken by others, such as LLWR Ltd.
- Monitoring of defence condition with repairs and maintenance undertaken as required.
- Development of an Asset Management Plan for the entire 11d5 frontage, setting out strategic aims. This should involve liaison with Sellafield and other key stakeholders along the frontage to consider multi-benefits of any longer term solution.
- Development of a funding strategy for defence maintenance and a joint scheme approach to future improvements for protection of the Sellafield nuclear site.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

11d5.4 Sellafield to Braystones (priority unit)

There are isolated rock armour and gabions but the majority of this frontage is undefended. Properties are located on the beach at the seaward toe of the railway embankment and some works have been undertaken by individuals to improve protection.

The proposed Moorside site extends from just south of policy unit 11d5.4 to just north of policy unit 11d5.5. Plans for the site are currently uncertain.

The current Shoreline Management Plan policy is No active intervention through to the long term but allows works to the railway if required. The railway is currently at low risk, therefore the preferred approach in the short term is to continue to monitor and undertake proactive maintenance as required.

Should the beach deteriorate and risk of coastal erosion increase (not anticipated within next 20 years) more substantial works could be required to continue to protect the railway. Constructing a new rock armour revetment, is likely to be most cost effective solution, in the long term but the decision will rest with Network Rail, who are responsible for maintaining defences along this frontage. Any revetment constructed by Network Rail will not, however, protect the beach front properties.

The approach in this unit should be developed in conjunction with the other frontages within the policy area to ensure a strategic solution; in addition to the risk to the railway, the potential contamination risk associated with Sellafield (11d5.3) post decommissioning needs to be taken into account.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and cliffs (this should be undertaken throughout 11d5).
- Monitoring of defence condition to inform residual risk with repairs and maintenance undertaken as required (mainly Network Rail).
- Development of an Asset Management Plan for managing risks to the railway for the entire 11d5 frontage, setting out strategic aims. This should involve liaison with key stakeholders along the frontage to consider multi-benefits of any longer term solution.
- Consider the need for a change in policy to support future shoreline management actions and to be consistent with adjacent frontages. This would need to follow a formal Shoreline Management Plan Policy Change process.
- Local and low scale private beach management be allowed to continue (by property owners) subject to consents and whilst sustainable to do so. Ongoing liaison with property owners to consider longer term options, such as relocation.
- Liaison with the owners of the Moorside site, Nuclear Decommissioning Authority, to inform future shoreline management decisions.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5.5 Braystones, Nethertown and Coulderton (priority unit)

The current Shoreline Management Plan management policy is Managed realignment in the short term with works only to be carried out if the railway is at risk.

Between Braystones and Nethertown there are various defences including sections of revetment protecting the railway, which are in good condition, and informal defences along the beach properties, comprising of gabion baskets and reprofiled shingle berms.

The railway is currently at low risk, therefore the preferred approach in the short term is to continue to monitor and undertake proactive maintenance as required.

Should the beach deteriorate and risk of coastal erosion increase (not anticipated within next 20 years) more substantial works could be required to continue to protect the railway. Constructing a new rock armour revetment, is likely to be most cost effective solution, in the long term but the decision will rest with Network Rail, who are responsible for maintaining defences along this frontage. Any revetment constructed by Network Rail will not, however, protect the beach front properties, including those in policy unit 11d5.6 at Coulderton.

The approach in this unit should be developed in conjunction with the other frontages within the policy area to ensure a strategic solution; in addition to the risk to the railway, the potential contamination risk associated with Sellafield (11d5.3) post decommissioning needs to be taken into account.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and cliffs (this should be undertaken throughout 11d5).
- Monitoring of defence condition to inform residual risk with repairs and maintenance undertaken as required (mainly Network Rail).
- Development of an Asset Management Plan for the entire 11d5 frontage, setting out strategic aims. This should involve liaison with key stakeholders along the frontage to consider multi-benefits of any longer term solution.
- Consider the need for a change in policy and policy unit boundary (to include Coulderton beach properties) to support future shoreline management actions and to be consistent with adjacent frontages. This would need to follow a formal Shoreline Management Plan Policy Change process.
- Local and low scale private beach management to continue subject to consents and whilst sustainable to do so. Ongoing liaison with property owners to consider longer term options, such as relocation.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5.6 Coulerton to Sea Mill (priority unit)

The current Shoreline Management Plan management policy is No active intervention with works only to be carried out if the railway is at risk.

There are two sections of revetment protecting the railway, these are in reasonable condition and are expected to last beyond 20 years, with shorter sections of rock protection.

The railway is currently at low risk, therefore the preferred approach in the short term is to continue to monitor and undertake proactive maintenance as required, including repair works to the existing defences.

Should the beach deteriorate and risk of coastal erosion increase (not anticipated within next 20 years) more substantial works could be required to continue to protect the railway. Constructing a new rock armour revetment, is likely to be most cost effective solution, in the long term but the decision will rest with Network Rail, who are responsible for maintaining defences along this frontage.

The approach in this unit should be developed in conjunction with the other frontages within the policy area to ensure a strategic solution.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and cliffs (this should be undertaken throughout 11d5).
- Monitoring of defence condition to inform residual risk with repairs and maintenance undertaken as required (mainly Network Rail).
- Development of an Asset Management Plan for managing risks to the railway across the entire 11d5 frontage, setting out strategic aims. This should involve liaison with key stakeholders along the frontage to consider multi-benefits of any longer term solution.
- Consider the need for a change in policy to support future shoreline management actions and to be consistent with adjacent frontages. This would need to follow a formal Shoreline Management Plan Policy Change process.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d5.7 Sea Mill to Pow Beck (priority unit)

The current Shoreline Management Policy is to Hold the line by maintaining existing revetment and rock armour defences and replacing with larger structures when necessary.

A thorough consideration of options at this location has already been undertaken in 2012 by Capita Symonds and we have incorporated findings from that more detailed study. Network Rail is currently in the process of implementing a scheme in collaboration with CBC to replace the existing defences with new rock armour. In addition, the scheme aims to repair the existing brick wall.

At present the railway line is not at high risk, therefore the preferred approach is for proactive maintenance, which should be sufficient to provide protection to the railway and properties beyond 50 years. This would involve maintaining the existing defences until they reach the end of their effective life span then replacing them in their current locations, with Sea Mill defences replaced in front of the car park rather than constructing new defences adjacent to the railway.

This would allow time for development of a long term solution (beyond 20 years). Improving the defence by constructing a new rock armour revetment is likely to be most cost effective solution.

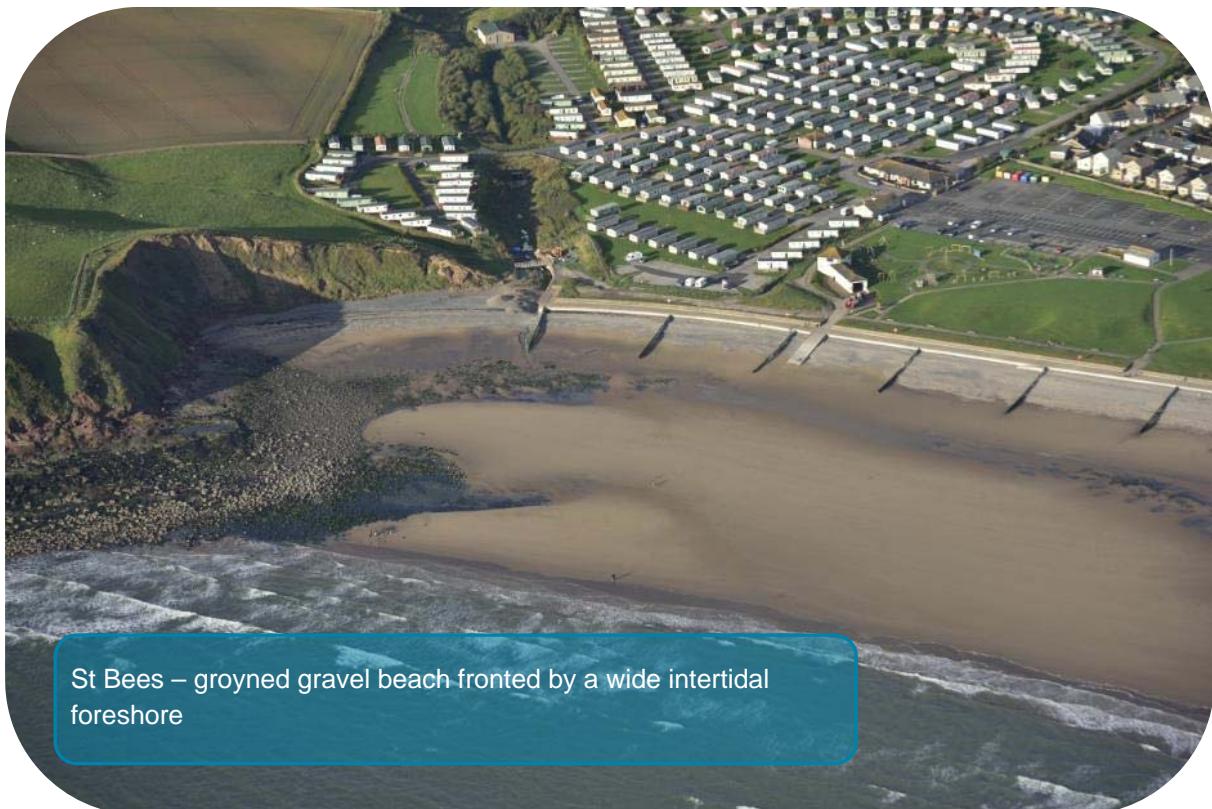
We recommend a number of future activities, such as:

- Continued monitoring of the beach and cliffs (this should be undertaken throughout 11d5).
- Monitoring of defence condition to inform residual risk with repairs and maintenance undertaken as required.
- Development of an Asset Management Plan for the entire 11d5 frontage, setting out strategic aims. This should involve liaison with key stakeholders along the frontage to consider multi-benefits of any longer term solution.

Development of a funding strategy for defence maintenance and improvements – potential investment should be sought from properties directly protected and Network Rail.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d6: St Bees



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|--|------------------------|
| Copeland Borough Council, private landowners | 11d6.1 Pow Beck to St Bees Promenade 11d6.2 St Bees Promenade | no yes |

This policy area extends from Pow Beck in the south northwards to the hard rock cliffs of St Bees Head.

The key risk along this frontage is coastal erosion which could result in the loss of land and ultimately properties at St Bees. There have been localised flood issues at St Bees but these have been related to the water course, Rottington Beck, rather than tidal flooding.

The following sections provide further details for each policy unit

11d6.1 Pow Beck to St Bees Promenade

The current Shoreline Management Plan policy is No active intervention. Continued erosion maintains the geological SSSI and value of the Heritage Coast and we do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

Continued maintenance of private defences, within their current footprint would remain appropriate, given their limited extent and presence of the adjacent defences, for as long as defences are maintained along the 11d6.2 frontage. Any extension or modification of these would require consent by Natural England.

There will also be a need to make sure that erosion along this frontage does not impact on defences along St Bees Promenade (11d6.2) – this is considered in the following policy unit.

We recommend a number of future activities, such as:

- Continued monitoring of the cliff and beaches.
- Safe siting of the England Coast Path, the route of which runs along the cliff top.
- Inspection of the condition of private defences along the frontage – failure of these could have consequences for the defences along 11d6.2.

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

11d6.2 St Bees Promenade (priority unit)

The shoreline is protected by a concrete seawall and promenade fronted by timber groynes, which are in a poor condition. The beach amenity and lifeboat access are at risk of coastal erosion and there is also some localised flood risk due to the watercourse, Rottington Beck. There is also concern regarding residual life of the promenade and issues of outflanking to the south.

The current Shoreline Management Plan policy is to hold the existing defence line in the short to medium term (up to 50 years), but with the longer term aim of managed realignment. However, studies to look into the real cost of realigning the shoreline, including the relocation of assets, have yet to be completed.

Therefore, the recommended strategic approach for this stretch of coast is to Hold the line in the short term, whilst these further studies are undertaken and a long-term solution developed. To prolong the life of the promenade, maintaining both the groynes and seawall is the most cost effective approach. Due to continued uncertainty regarding the effectiveness of groynes in holding a beach here (which has both recreational and coastal defences benefits), this would be subject to ongoing monitoring. If the beach is not retained, then there may be a need for additional seawall toe protection works to address the potential risk of undermining.

In the longer term (beyond 50 years) it is likely to become increasingly difficult to retain a beach and more substantial works would be required to hold the promenade in its existing position. The preferred long term strategy is therefore to realign the defences to a set-back position, but this will require further investigations to decide on the best set-back alignment, identify funding and consider asset relocation options.

We recommend a number of future activities, such as:

- Inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Monitoring of beach behaviour to gather data to inform studies into managed realignment approaches.
- Study to reconsider the role of the groynes, taking into account latest monitoring data.
- Study to consider possible realignments in the long term and necessary relocation/ adaptation of existing assets.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11d7: St Bees Head



This policy area includes the following policy unit:

| Responsibilities | Policy Unit | Is it a priority unit? |
|------------------|-------------|------------------------|
|------------------|-------------|------------------------|

| | | | |
|--------------------------|--------|--------------|----|
| Copeland Borough Council | 11d7.1 | St Bees Head | no |
|--------------------------|--------|--------------|----|

This policy area covers the headland of St Bees Head, between North Head and South Head. The resistant St Bees cliffs are of great geological and ecological interest for their sedimentary structures and exposures and the number of different habitats they support. Erosion of the cliffs is very slow, usually less than 0.15 m per year and the cliff top is undeveloped, characterised by a patchwork of arable fields.

The following section provides further details for the policy unit

11d7.1 St Bees Head

The current Shoreline Management Plan policy is No active intervention. Continued erosion maintains the geological, environmental and landscape value of this Heritage Coast and we do not think that the policy should change at this time, which would be implemented through a Do nothing approach.

A future activity is:

- Safe siting of the England Coast Path, the route of which runs along the cliff top.

11e1: St Bees Head to Whitehaven



This policy area includes the following policy unit:

| Responsibilities | Policy Unit | Is it a priority unit? |
|--|-----------------------------------|------------------------|
| Copeland Borough Council (south of the Harbour), Whitehaven Harbour Commissioners (Whitehaven Harbour) | 11e1.1 St Bees Head to Saltom Pit | no |
| | 11e1.2 Saltom Pit | no |
| | 11e1.3 Saltom Pit to Whitehaven | no |
| | 11e1.4 Whitehaven South Beach | yes |

This policy area lies between the headland of St Bees and the southern side of Whitehaven, up to the harbour.

The key risk to this frontage is erosion. At the northern end of the frontage, spoil material from historical industry in the area has historically been dumped in front of the cliffs, forming new artificial but unconsolidated low cliffs, pushing the shoreline seawards. This activity ceased in the 1930s and the shoreline has experienced retreat since this time.

 The following section provides further details for the policy unit

11e1.1 St Bees Head to Saltom Pit

The current Shoreline Management Plan policy along this frontage is No active intervention. Continued erosion maintains the geological, environmental and landscape value of this Heritage Coast and we do not think that the policy should change at this time.

We recommend a number of future activities, such as:

- Engagement with National Trust and Colourful Coast Partnership, providing recording of historical assets and ongoing maintenance in order to inform future management plans.
- Safe siting of the England Coast Path; the route of this is open but not yet available for public use (anticipated 2020). The route needs to be monitored, with assessments recommended following high precipitation events and storm periods to ensure risk to users is minimised.

11e1.2 Saltom Pit

The current Shoreline Management Plan policy along this frontage is to Hold the line through maintaining defences and undertaking localised cliff stabilisation until technically difficult or not affordable to do so.

The works undertaken previously have reduced toe erosion along the site, but they have not addressed the larger scale issues of land sliding and this remains the key risk to the site. Although further works along the toe would be unlikely to be considered detrimental to adjacent designated areas, they would be largely ineffective in making the site any safer.

Under the current policy, Copeland Borough Council is responsible for maintenance (subject to technical feasibility and affordability) but maintenance works are no longer possible due to inaccessibility of the site for health and safety reasons.

The frontage is an important heritage site, with the Scheduled Monument of Saltom Pit located near the base of the cliffs. Colourful Coast Partnership (National Trust and Land Trust) is planning further investigations into the threat of cliff instability through cliff stability surveys. Therefore, the preferred strategic approach for the short term is to retain the existing policy of Hold the line whilst land stability studies are undertaken to appraise the technical viability of this policy option.

Longer term approaches will depend upon the outcome of the studies, which may mean the long term Shoreline Management Plan policy of No active intervention policy is brought forward.

We recommend a number of future activities, such as:

- Use of a UAV (drone) to monitor condition of the defences and review safety of site access (subject to permission from the National Trust).
- Cliff stability surveys to investigate the current degree of threat of landsliding and to help inform a potential Shoreline Management Plan policy change.
- Liaison between Copeland Borough Council, the Colourful Coast Partnership and Historic England to review the situation following studies.
- Monitoring public access. Currently footpaths cross the cliff top – these need to be monitored, with assessments recommended following high precipitation events and storm periods to ensure risk to users is minimised. The England Coast Path (open but not yet available for public use), although set back from the coastal edge, may also be at risk from cliff slippage and ground movements.
- Any additional recording of historical assets before they are lost to erosion, taking account of health and safety risks involved in accessing the monument site.

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

11e1.3 Saltom Pit to Whitehaven

The current Shoreline Management Plan policy along this frontage is No active intervention. The policy maintains a naturally functioning coast and there would be unlikely to be justification for long term defence. We do not think that the policy should change at this time and this would be implemented through a Do nothing approach.

We recommend a number of future activities, such as:

- Any additional recording of historical assets before they are lost to erosion, taking account of health and safety risks involved in accessing the monument site.
- Currently there is a footpath that runs along the cliff top – this needs to be monitored, with assessments recommended following high precipitation events and storm periods to ensure risk to users is minimised.

11e1.4 Whitehaven South Beach (priority unit)

The current Shoreline Management Plan policy is No active intervention, which allows existing defences to continue to fail, but recognises the need to monitor the long term risk of breach of the southern harbour arm and the possible need for additional works to this structure. An additional issue with respect to the future strategy here is the nature of the waste into which the cliffs are cut and any potential contamination issues, as well as the rate of erosion of this material.

A thorough consideration of approaches at this location has already been undertaken in 2016 by AECOM and we have incorporated findings from this more detailed study.

The preferred strategic approach is to continue to monitor risks due to erosion and to undertake studies to determine the risks related to contamination from the eroding spoil, whilst ensuring continued integrity of harbour structures through implementation of a Hold the line policy in the adjacent policy unit (11e2.1).

The appropriate approach from the medium term depends upon the outcome of studies to investigate potential contamination risks from erosion of industrial spoil. Assuming there is no change in requirement to introduce defences in the immediate future to prevent further erosion, then erosion will be allowed to continue and works will be limited to maintaining the harbour arm in the adjacent policy unit to ensure its integrity.

If it is found that there is a long term need to Hold the line to prevent erosion of contaminated landfill, and there are no other options for its removal, then a number of approaches to Hold the line should be reconsidered at that time to identify the most suitable approach to both prevent contamination and also to support any other regeneration proposals in the area.

We recommend a number of future activities, such as:

- Investigate potential contamination issues of spoil cliffs.
- Monitor erosion of the spoil cliffs.
- Monitor areas of newly exposed harbour arm for structural integrity.
- Relocation or diversion of the United Utilities sewer before it becomes at significant risk.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2: Whitehaven to Workington



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|--|---|------------------------|
| Copeland Borough Council (northern boundary near Copperas Hill), Allerdale Borough Council, Network Rail, Whitehaven Harbour Commissioners, Harrington Harbour and Dock Board, Port of Workington (Cumbria County Council) | 11e2.1 Whitehaven Harbour and north beach | no |
| | 11e2.2 Bransty to Parton | yes |
| | 11e2.3 Parton | yes |
| | 11e2.4 Parton to Harrington Parks | yes |
| | 11e2.5 Harrington Parks to Harrington Harbour | yes |
| | 11e2.6 Harrington Harbour | no |
| | 11e2.7 Harrington to Steel Works Site | yes |
| | 11e2.8 Steel Works Site | yes |
| | 11e2.9 Steel Works to The Howe | yes |
| | 11e2.10 The Howe to Workington Harbour south breakwater | yes |
| | 11e2.11 Workington Harbour | no |

This policy area covers the open coastline between Whitehaven Harbour and Workington Harbour and includes the settlements of Whitehaven (including Bransty), Parton, Harrington (including Harrington Harbour) and Workington.

The Cumbrian Coast Line railway runs parallel, immediately adjacent to the coastline throughout the area and is an important link between the various towns and villages.

 The following sections provide further details for each policy unit 

11e2.1 Whitehaven Harbour and north beach

The current Shoreline Management Plan policy is Hold the line by maintaining harbour walls and gates. It was assumed that the harbour would remain operational, with maintenance of the harbour structures the responsibility of Whitehaven Harbour Commissioners.

We do not think that the policy should change at this time, but this will rely on funding availability. The preferred strategic approach is to implement the Shoreline Management Plan policy through maintaining the existing defences.

It is recommended that development plans for Whitehaven consider potential improvements to the coastal frontage including upgrading the current defence.

We recommend a number of future activities, such as:

- Continued inspection of defences, particularly monitoring toe movement between the slipways where movement has occurred due to beach losses.
- Liaison between developers and local authority to discuss consideration of future protection of the shoreline and potential funding opportunities.
- Should plans progress regarding potential extension of the current defences seaward, a full investigation will be required to assess impacts and the need to formally change Shoreline Management Plan policy.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.2 Bransty to Parton (priority unit)

The current Shoreline Management Plan policy is Hold the line by maintaining and upgrading railway defences.

Throughout this frontage the railway line lies directly at the back of the beach, along the base of the natural cliffs and supported by vertical masonry seawalls. There is

now very little beach and works to prevent undermining of these walls have been necessary in the past.

There also appears to be a risk of wave overtopping of the defences. This would both affect operation of the railway but also cause damage behind the seawall. This frontage has been highlighted by Network Rail as a priority due to the flood risk from wave overtopping and risks of cliff falls. Currently the line has a speed restriction.

It is understood that there is a proposal for cliff reprofiling at Bransty to reduce cliff fall risk to the railway and to supply rock for a small reclamation at North Beach in 11e2.1.

In the short term, maintaining existing defences through proactive management or improving existing defences align with the currently proposed short term works planned by Network Rail and would be adequate for some years, but it is considered likely that within 50 years there will be a need to construct a new defence.

There are two possible approaches, either a replacement seawall, or a seaward rock berm. The decision regarding which approach will depend upon Network Rail, as they currently are responsible for defences along this unit, but would also need to take account of potential impacts on important upper beach and intertidal habitats.

Given the exposed location of the railway along this frontage, realignment could also be considered in the future. If this is a possibility beyond the next 10 to 20 years, then a more suitable short term approach would be to continue to carry out remedial works on the current defences.

We recommend a number of future activities, such as:

- Continued monitoring of the beach to improve understanding of the level of risks to the railway.
- An Asset Management Plan should be developed including prioritising future works here with other works needed along the route.
- Proactive maintenance, repair and refurbishment of defences (Network Rail).

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.3 Parton (priority unit)

The current Shoreline Management Plan policy is Hold the line by maintaining and upgrading railway defences.

Throughout most of 11e2.3 the railway line lies directly at the back of the beach, along the base of the natural cliffs and supported by vertical masonry seawalls, without which the railway would not be viable. There has been a number of issues with erosion along the railway over time.

In the short term, maintaining existing defences through proactive management or improving existing defences align with the currently proposed short term works planned by Network Rail and would be adequate for some years, but it is considered likely that within 50 years there will be a need to construct a new defence.

There are two possible approaches, either a replacement seawall, or a seaward rock berm. As part of any scheme, the possibility of reducing flood risk through the railway arches should be considered. The decision regarding which approach will depend upon Network Rail, as they currently are responsible for defences along this unit, but would also need to take account of potential impacts on important upper beach and intertidal habitats.

At Parton, there also needs to be joint working between Network Rail the community and the other strategy partners in order to find the best solution to deduce the risk to the railway and the village from flooding.

Given the exposed location of the railway along this frontage, realignment could be considered in the future. If this is a possibility beyond the next 10 to 20 years, then a more suitable approach would be to continue to carry out remedial works on the current defences.

Even with realignment, there would remain a flood risk to people and property at Parton, but this could be addressed separately through a setback seawall, subject to funding being sought.

We recommend a number of future activities, such as:

- Continued monitoring of the beach to improve understanding of the level of risks to the railway.
- An Asset Management Plan should be developed including prioritising future works here with other works needed along the route.
- A combined tidal and fluvial flooding and erosion risk assessment for Parton.
- Proactive maintenance, repair and refurbishment of defences including renewal of rock armour protection to toe of sea walls (various locations) (Network Rail).

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.4 Parton to Harrington Parks (priority unit)

The current Shoreline Management Plan policy is Hold the line by maintaining and upgrading railway defences.

Throughout most of this frontage the railway line lies directly at the back of the beach, along the base of the natural cliffs. The defences vary, with lengths of vertical

and sloping seawalls, lengths of rock revetment or possibly randomly tipped rock, whilst other stretches have no defences at all and are actively eroding.

To Hold the line to maintain the railway in the long term, the technically preferred approach is to provide a formal rock revetment. It is recommended that this is done well in advance of the risk to the railway becoming critical, which it possibly already is in places. However, the decision regarding the approach will depend upon Network Rail, as they currently are responsible for defences along much of this unit but would also need to take account of potential impacts on important upper beach and intertidal habitats.

Prior to a decision being made on the long term solution, in the next 10 years the proposed strategic approach is to maintain existing defences through proactive management.

We recommend a number of future activities, such as:

- Continued monitoring of the beach to improve understanding of the level of risks to the railway.
- An Asset Management Plan for defences to the railway should be developed including prioritising future works here with other works needed along the route.
- Proactive maintenance, repair and refurbishment of defences including installation of rock armour protection to sea walls (various locations) and repairs to concrete and masonry walls (Network Rail).

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.5 Harrington Parks to Harrington Harbour (priority unit)

The railway and other built assets are set back from the coastal edge, with the area at risk from erosion now protected from development as a village green recreational space. However, this is predominantly ‘made ground’ created by slag deposits and other tipped spoil and includes the site of a former iron works and then a magnesite plant, demolished in the 1960s.

The current Shoreline Management Plan policy is to Hold the line in the short term, but changing to No active intervention in the longer term. This was, however, subject to a study into the risk of contamination from erosion of the former industrial sites. This study has not yet been undertaken, therefore the proposed strategic approach is to continue to maintain defences through proactive management, with the approach from the medium term dependent upon the outcome of these studies.

If there is a long term need and funding available to hold the line for large parts of this policy unit, then the most suitable technical approach would be to provide a

formal rock revetment both along the currently undefended length and over the existing structures.

However, if instead the contamination risk is found to be low, the recommended approach here would be to continue to maintain defences through proactive management but to monitor erosion to establish if other assets (for example the railway line, Harrington Harbour and the overall amenity of the village green) might become at risk. This could identify the need to intervene in the longer term (beyond 20 years).

We recommend a number of future activities, such as:

- Undertaken a contamination risk assessment as soon as possible.
- Monitor erosion of spoil material.
- Proactive maintenance and repair of defences (Network Rail).
- Subject to the outcome of studies into contamination and erosion risks, consider the need to change policy. This would need to follow a formal Shoreline Management Plan Policy Change process.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.6 Harrington Harbour

The Shoreline Management Plan policy is Hold the line by maintaining harbour walls. It was assumed that the harbour remains operational. We do not think that the policy should change at this time, but this will rely on funding availability.

We recommend a number of future activities, such as:

- Continued inspection and maintenance of harbour structures, with repairs and remedial works undertaken by Harrington Harbour and Dock Board as necessary.
- Depending on the policy for 11e2.5, there may need to be further investigations into the vulnerability of the south pier of Harrington Harbour. 11e2.5 frontage currently protects the South Pier inner section from the prevailing conditions. Any erosion of the beach and slag slopes here could place this structure at greater risk of failure.
- Liaison between potential developers and Allerdale Borough Council to develop future regeneration plans and ensure integrated approach to considering coastal erosion and flooding risks along adjacent frontages and identify potential funding opportunities.

- Should plans progress regarding potential extension of breakwaters, a full investigation will be required to assess impacts locally and on adjacent shorelines and nearshore.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.7 Harrington to Steel Works Site (priority unit)

The current Shoreline Management Plan policy is Hold the line but this actually means that nothing would be done until the railway is at risk, then railway defences would be constructed.

There are no formal defences along this frontage. The railway runs along the frontage but is slightly set back from the coastal edge and fronted by an artificial bank of tipped spoil material (slag). This slag is currently eroding. There are some properties behind shoreline at southern end but these are protected by the northern harbour breakwater.

This area has been identified as part of a wider area for potential regeneration of Harrington. A feasibility study was undertaken in 2006 and this included proposals to develop the area north of the harbour, including a new promenade and residential properties between the shoreline and the railway line.

The proposed strategy is to implement the existing Shoreline Management Plan policy of Hold the current line, and to do so before erosion risks to railway become critical, enabling a buffer to be created. The preferred approach is to provide a formal rock revetment along the artificial shoreline of mine waste (slag) to prevent any further erosion. Any final decision will depend upon Network Rail, as their assets are primarily at risk, but will also need to consider any impact on important upper beach and intertidal habitats.

We recommend a number of future activities, such as:

- Detailed risk assessment (required immediately) to determine the point at which erosion may result in instability of the railway line, to inform both safe operations of the line and enabling proactive construction of defences accordingly.
- Consider opportunities to include frontage as part of regeneration plans in the area.
- Investigations into the potential contamination risk from eroding waste.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.8 and 11e2.9 (part) Steel Works Site (priority unit)

The current Shoreline Management Plan policy is Hold the line by maintaining and upgrading the seawall and revetment.

This frontage consists of eroding slag deposits and there is only a short length of formal defences. There has been partial development of the former CORUS site with housing and there are plans to expand that development. It may be necessary to change the policy boundary between 11e2.8 and 11e2.9 to allow for this expansion.

The present defences are not in a condition suitable for providing the long term protection that will now be required to prevent erosion of this area. There are also significant health and safety hazards in places where there is exposed steel from the seawall and sheet piles.

The preferred strategic approach is to construct a formal rock revetment along the undefended lengths of this policy unit where there is a risk to assets, and to replace the existing defences, which are inadequate, with a similar design. As part of this, there may be a benefit of reprofiling the cliff slope, but this would need further investigations into potential contamination risk.

We recommend a number of future activities, such as:

- A full risk assessment for any new development should be produced to assess both the required extent of the new defences, and risks posed by the failure of the existing structures.
- Scheme development and construction of new defences, subject to developer funding.
- Contamination risk assessment to consider risks from erosion of the former quarry works and waste infill (with study in 11e2.9).
- Review the location of the Shoreline Management Plan policy unit boundary to 11e2.9, to include the whole of the development site in 11e2.8. Any change may need to follow a formal Shoreline Management Plan Policy Change process.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.9 Steel Works to The Howe (priority unit)

The current Shoreline Management Plan policy is No active intervention.

This frontage consists of a largely undefended cliff of former slag deposits (known as Derwent Howe slag bank). The southern part of this unit, the former CORUS site; is considered in 11e2.8 above, and along the remainder of this unit there are no cliff top assets at risk.

Derwent Howe slag bank was operated as a quarry from the early 1990s up until planning permission expired in late 2016. It is owned by the County Council, with extraction undertaken by a local operator. As well as slag extraction, the site was used for the deposit of inert waste materials and recycling of wastes. Given the possibility of contamination risk due to erosion, a number of approaches have been considered to Hold the line here.

Unless a contamination risk is identified, then the preferred approach would be to cease any maintenance of current structures and consider reuse of materials elsewhere.

If there are contaminant risks due to erosion of the quarrying site, then a further assessment of potential approaches and a review of the Shoreline Management Plan policy would need to be considered ahead of implementing measures to hold the line.

Therefore, at this stage the appropriateness of the Shoreline Management Plan policy remains uncertain and the preferred strategy cannot be concluded until such investigations are undertaken.

We recommend a number of future activities, such as:

- Contamination risk assessment to assess contamination from erosion of the former quarry works and waste infill.
- Review the location of the Shoreline Management Plan policy unit boundary with 11e2.8, to include the whole of the development site in 11e2.8. Any change may need to follow a formal Shoreline Management Plan Policy Change process.

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

11e2.10 The Howe to Workington Harbour south breakwater (priority unit)

The current Shoreline Management Plan policy is Managed realignment by allowing defences to fail and erosion to occur until assets are at risk or risk of contaminated land justifies defences.

This is a largely undeveloped area, believed to be made up of former slag deposits, which is currently protected by a length of rock armour revetment. Built assets are located several hundred metres inland, so not at risk but erosion would have implications for the south pier structures of Workington Harbour. This frontage is part of a larger area that is being proposed for a major regeneration scheme (Port Derwent). Any future development plans will need to take account of erosion risk to the site.

Unless a contamination risk is identified, then the preferred strategic approach would be to stop any maintenance of current structures and consider reuse of materials

elsewhere. Some works to the harbour arm may however be required to ensure its stability and limit any erosion and overtopping risks (this is considered in 11e2.11).

If there are contaminant risks identified, then a further assessment of potential approaches and a review of policy would need to be considered ahead of implementing measures to Hold the line.

Therefore, at this stage the appropriateness of the Shoreline Management Plan policy remains uncertain and the preferred strategy cannot be concluded until such investigations are undertaken.

We recommend a number of future activities, such as:

- Assessment of the potential contamination risk from the landfill site.
- Further studies of erosion and flood risk related to proposals for a major redevelopment scheme in this area.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e2.11 Workington Harbour

The Shoreline Management Plan policy is Hold the line, based on the assumption that the harbour remains operational.

We do not think that the policy should change at this time and the preferred strategic approach is to implement this through maintaining the existing defences, but this will rely on funding availability. Workington Harbour is a Municipal Port owned and operated by Cumbria County Council, who maintain responsibility for maintenance of structures.

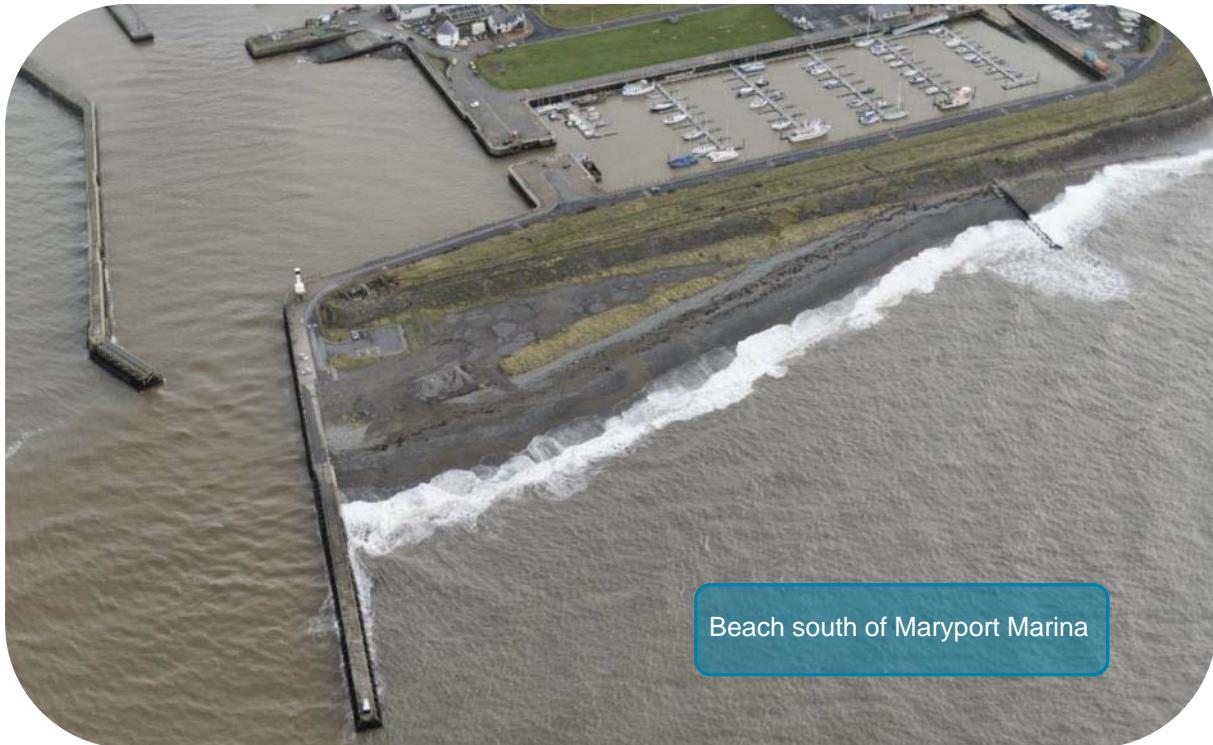
We recommend a number of future activities, such as:

- Continued inspection and maintenance of harbour structures, with repairs and remedial works undertaken by Cumbria County Council as necessary.

Depending on the policy for 11e2.10, there may need to be further investigations into the vulnerability of the south pier of Workington Harbour. The Howe currently protects the South Pier inner section from the prevailing conditions. Any erosion of the beach and slag slopes here could place this structure at greater risk of failure.

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

11e3: Workington to Maryport



This policy area includes the following policy units:

| Responsibilities | Policy Unit | Is it a priority unit? |
|---|--------------------------------------|------------------------|
| Allerdale Borough Council, Network Rail, United Utilities | 11e3.1 Workington Harbour to Siddick | yes |
| | 11e3.2 Siddick to Risehow | yes |
| | 11e3.3 Risehow to Maryport Marina | no |
| | 11e3.4 Maryport Harbour and Marina | no |

This policy area stretches along the open coastline between Workington Harbour and Maryport and includes north Workington, Siddick, Flimby, Risehow and the southern side of Maryport.

Around a third of this frontage is currently undefended and most of these sections comprise artificial tipped deposits such as slag waste and colliery spoil. Elsewhere there are intermittent concrete defences. The Cumbrian Coast Line runs along the back of the beach along much of this frontage and in places is at risk from erosion and wave overtopping.

The following sections provide further details for each policy unit

11e3.1 Workington Harbour to Siddick (priority unit)

This unit comprises three sections: undefended slag cliffs at either end, which are actively eroding, between which are a series of concrete walls/revetments fronting the former landfill site and wind turbine site. Further rock protection has been placed for a short length along sections at either end of these walls.

The railway and most development are set back from the coastal edge in this area so are not at erosion risk. The only justification for any defences is the potential erosion and loss of individually sited wind turbines and the possible risks of pollution from erosion of the former iron works site and associated landfill.

The most southern end of the unit, adjacent to Workington Harbour (11e2.11), is an area where continued defence will need to be provided to ensure erosion and flood risk to the harbour and beyond are managed appropriately.

The current Shoreline Management Plan policy is to Hold the line in the short term, but changing to Managed realignment in the longer term. This was, however, subject to a study into the risk of contamination from erosion of the former industrial sites. This study has not yet been undertaken, therefore the recommendation is to continue to maintain defences in the short term.

Due to current condition of the defences this would need to involve low cost measures and may also require toe protection along currently undefended frontages in the future.

The future approach (from around 20 years) will depend upon the outcome of the investigations. So at this stage the appropriateness of the medium to long term Shoreline Management Plan policy of Managed realignment remains uncertain and the preferred strategy cannot be concluded until such investigations are undertaken.

We recommend a number of future activities, such as:

- Assessment of the contamination risk from erosion of the former industrial and landfill sites.
- Inspection of the existing structures, with consideration of health and safety risks due to failing defences and the need for warnings to or exclusion of the public from the defences.
- Development of an Asset Management Plan by infrastructure (wind turbine) owners, setting out strategic aims.
- If a contamination risk is recognised, more detailed scheme development studies would need to be undertaken. As part of this there may be a need for a change in Shoreline Management Plan policy.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e3.2 Siddick to Risehow (priority unit)

This policy unit is much lower lying than units to the south. There are two distinct parts to frontage, a defended frontage south of Seaton and a mainly undefended frontage north of Seaton (including Flimby). There is also potential for redevelopment of former industrial sites, for example at Flimby.

The current Shoreline Management Plan policy is to Hold the line through to the long term, however to support this alternative funding would need to be sought.

There are various approaches possible, but the preferred approach, subject to funding and further investigations, would be to provide a formal rock revetment. This may need to be higher than the current low bank level to appropriately manage risks from wave overtopping and flooding in the future. It is possible that a phased approach could appropriate, addressing areas of concern as they occur.

In the short term, works will be required to maintain the existing defences to allow time for schemes and funding to be developed for the longer term solutions. The preferred and most cost-effective approach would be proactive maintenance.

We recommend a number of future activities, such as:

- Improve understanding of the level of risks to the railway and operations through monitoring of the beach and cliff erosion.
- Development of an Asset Management Plan by Network Rail, setting out strategic aims to manage risks to the railway. This needs to include the southern end of the adjacent policy unit 11e3.3.
- More detailed scheme development studies are required, which consider additional benefits such as the railway and United Utilities infrastructure and potential for funding from other parties.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e3.3 Risehow to Maryport Marina

The current Shoreline Management Plan policy is No active intervention from the short term. This would involve allowing defences to fail.

Due to the limited assets at coastal erosion or flood risk we do not think that the policy should change at this time, which will be implemented through a Do nothing approach.

Monitoring is needed to assess any change in risk at the southern end of this unit, where the railway line lies closer to the shoreline and also to monitor the risk of outflanking due to defences along the adjacent frontages.

We recommend a number of future activities, such as:

- Continued monitoring of the beach and cliffs.
- Inclusion of the southern end of this unit in an Asset Management Plan for Network Rail, to ensure a strategic approach to managing risks along the wider frontage.
- Liaison with Natural England regarding the England Coastal Path that will potentially need to be rolled back in the future.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e3.4 Maryport Harbour and Marina

The current Shoreline Management Plan policy is Hold the line through maintaining and upgrading revetments and harbour defences. This would maintain the integrity of Maryport town and manage risk to Scheduled Monuments and heritage assets in the harbour area, including the Maryport Lighthouse (Grade II listed). Recent improvements have been made to a groyne along this frontage which may help hold the beach locally.

We do not think that the policy should change at this time and the preferred strategic approach is to continue to implement the policy by maintaining and repairing the defences as necessary.

Future works may depend upon funding. It is therefore recommended that any regeneration plans for Maryport consider potential improvements to the coastal frontage including upgrading the current defence; this could also be an opportunity to improve access and amenity use of the frontage.

We recommend a number of future activities, such as:

- Continued inspection and maintenance of harbour structures and embankment in front of the marina, with repairs and remedial works undertaken as necessary.
- Monitoring to appraise success of the recent groyne works.
- Liaison between potential developers, the Coastal Community Team and Allerdale Borough Council to develop future regeneration plans and ensure integrated approach to considering coastal erosion and flooding risks along adjacent frontages and to identify potential funding opportunities.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e4: Maryport to Dubmill Point



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|--|------------------------|
| Allerdale Borough Council, Cumbria County Council, private landowners | 11e4.1 Maryport Harbour to Roman Fort | no |
| | 11e4.2 Roman Fort to Bank End | no |
| | 11e4.3 Maryport Golf Course to Allonby | yes |
| | 11e4.4 Allonby | yes |
| | 11e4.5 Allonby to Seacroft Farm | yes |
| | 11e4.6 Seacroft Farm to Dubmill Point | yes |

This policy area runs from Maryport Harbour to Dubmill Point and includes Allonby Bay. The B5300 runs adjacent to the coastline through this area and is an essential link between Maryport, Allonby and Silloth as well as serving the smaller settlements and farmsteads within the area.

The key risk to this frontage is erosion, but there are localised issues of flooding related to where small rivers and beckets meet the shoreline. There are also wave overtopping related flooding issues along the B5300 road between Crossbeck and Dubmill Point.

 The following sections provide further details for each policy unit 

11e4.1 Maryport Harbour to Roman Fort

The current Shoreline Management Plan policy is Hold the line by maintaining the current seawall and upgrading the wall when necessary. This will maintain the integrity of Maryport and to manage risk to heritage assets.

We do not think that the policy should change at this time, particularly given the reasonable condition of the defences. However, recent overtopping of the seawall highlights a potential vulnerability and risk levels will need to be monitored. There may also be a need for refurbishment of flood gates. Much of Maryport is located on higher ground, but there could otherwise be impacts on properties lying in front of the cliff line. If new or modified defences are required, funding will need to be sought.

We recommend a number of future activities, such as:

- Continual inspection of defences with repairs and remedial works to be undertaken as necessary.
- Future assessment of risk associated with potential increase in overtopping frequency.
- Study to appraise need for flood gate refurbishment.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e4.2 Roman Fort to Bank End

The current Shoreline Management Plan policy is to Hold the line in the short term but moving to No active intervention beyond this through withdrawing maintenance of the defences.

The current defence is considered to be in reasonable condition and given that beach lowering is not an issue here, as resistant bedrock is already exposed along much of its length, it may be possible to extend the life of the defence through proactive maintenance.

In the short term, a Do minimum approach is considered to be a more appropriate approach, which may extend the life beyond the Shoreline Management Plan short term (up to 20 years).

In the longer term, there may be a case made for changing the Shoreline Management Plan policy depending upon plans for the cycleway. A key factor in the

original policy was lack of economic justification, so any change in policy would need to demonstrate wider benefits.

We recommend a number of future activities, such as:

- Continued inspection of defences with repairs and remedial works to be undertaken as necessary (in the short term).
- Review policy as part of the plans for developing the cycleway, including appraisal of wider benefits that can be attributed to this policy area and development of a funding strategy if future works are likely. This may also involve changing the boundary between policy units 11e4.1 and 11e4.2 or a change in Shoreline Management Plan policy.
- Any modification to or replacement of the existing structures would require consent from Natural England. Consultation with Historic England and AONB would also be required, due to potential impacts on heritage and landscape features in the area.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e4.3 Maryport Golf Course to Allonby (priority unit)

This unit essentially comprises three sections:

- (1) the golf course frontage, where there are currently only informal defences
- (2) between the golf course and Swarthy Hill, where there are currently stretches of gabion baskets in place to protect the public highway and the Saltpans Scheduled Monument, which are managed by Cumbria County Council
- (3) an undefended stretch of coast to the south of Allonby.

The current Shoreline Management Plan policy is for managed realignment from the short-term but with a requirement to raise or relocate the B5300, which provides a vital local transport link between Maryport and Silloth and access into and out of the village of Allonby. Since the Shoreline Management Plan studies have been undertaken to consider relocation of the road, particularly at specific pinch points, such as Crosscannonby in this policy unit. A decision is, however, still to be reached.

Therefore, in the short term, the preferred approach is to Do minimum , which will involve reactive works along the existing defences. This should mean defences can be retained for a further 10 to 20 years and allow time for managed realignment adaptation approaches to be investigated further and implemented.

In the longer term, rerouting of the B5300 is recommended, subject to further studies on route and the requirements for medium to longer term protection to features of the Hadrian's Wall WHS.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline change, including post-storm surveys, given the proximity of the road to the coast at locations.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Monitoring and management of coastal risks to road users - this will include clearance of any beach material and use of road closure signage to manage risks during storms.
- Relocation of telecom utilities located in eroded beach and verge.
- Further studies and consultation to further investigate viability and funding for localised road realignment alongside consideration of other pinch points on the B5300.
- Discussion with Historic England regarding long term options for historic sites along this stretch of coastline.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e4.4 Allonby (priority unit)

At present, there are no formal defences and protection to the village of Allonby is provided by a wide upper shingle beach backed by sand dunes. The shoreline is stable or accreting.

The current Shoreline Management Plan policy is to hold the line, through monitoring shoreline change and flood risk until the village is at significant risk, then constructing new sea defences. Present risk to Allonby is low and whilst this remains the case no intervention is required and the preferred approach is Do minimum, which will involve monitoring the situation and undertaking works to manage flood risk due to blockage of Allonby Beck.

Should the beach start to reduce in size in the future, works will be required to manage risks to Allonby and the B5300. Initially, small scale or low cost measures to slow erosion of the dunes and retain them as the primary protection, may be sufficient. If erosion is more extensive, more substantial structures could be considered, particularly those that might help retain a beach but the choice of approach will need to consider potential impacts on important intertidal habitats.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline change, as part of the North West Regional Monitoring Programme, to identify any change in risk.
- Development of a beach management plan for Allonby: this should (1) set out monitoring and maintenance of Allonby Beck and (2) define trigger levels at

which alternative management approaches need to be developed for the long term protection of Allonby.

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

11e4.5 Allonby to Seacroft Farm (priority unit)

Most of this frontage is undefended, but at the very northern end of this unit there is a short section of randomly tipped rocks providing erosion edge protection to the highway. The B5300 runs along the whole length of this frontage. It is set back a little behind the coast until north of Oldkiln, beyond which it lies along the coastal edge.

The current Shoreline Management Plan policy is No active intervention, but this is not compatible with adjacent frontages unless there is realignment of the B5300 coastal road (and associated United Utilities assets). There is also a need for a study to consider how holding Dubmill Point affects the frontages to either side, such as this policy unit. This is required before the long term strategy is confirmed.

Along the majority of the frontage, the dune and beach currently provide sufficient protection. Whilst this remain the case no intervention is required and the preferred approach is to monitor the situation, which aligns with the Shoreline Management Plan policy.

Along the northern 400 m stretch, where the highway is at risk and where United Utility assets lie close to the shore further south, the preferred strategic approach would be for localised works to temporarily bolster existing defences, such as rock armour or rock gabions whilst a managed realignment solution for this and adjacent policy units is developed.

This would be an extension of the defences at Oldkiln and so a change in policy unit boundary to include this northernmost stretch within 11e4.6 could be considered.

We recommend a number of future activities, such as:

- Undertake a study to improve understanding of the consequences of managed realignment at Dubmill Point on coastal behaviour.
- Continued monitoring of shoreline change, including post-storm surveys, given the proximity of the road to the coast at locations.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Consider the need for a formal change in Shoreline Management Plan policy unit boundaries.
- Progress beach management and or erosion slowing defences at Unity Utility assets near Crossbeck subject to consents.
- Progress beach management and or erosion slowing temporary defences at for B5300 near Oldkiln subject to consents.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e4.6 Seacroft Farm to Dubmill Point (priority unit)

The B5300 runs immediately behind the defences within this unit and depends on the current defences. This is a key link road within the area and if not protected would need to be relocated inland.

Along the whole of this unit there is stepped or sloping concrete revetment. There are also groynes in variable condition. Additional rock armour has been placed along the toe of defences across much of its length, to reduce scour and undermining.

The current Shoreline Management Plan policy is Hold the line to enable time to reroute the coastal road, moving to no active intervention from the medium term. This was, however, reliant on further studies into: (1) relocation of the B5300 and (2) the potential wider scale impacts of allowing retreat of Dubmill Point, which may be a control on the adjacent shorelines.

A decision is still to be reached on relocating the B5300. Therefore, in the short term, the preferred approach is to temporarily Hold the line, through proactive maintenance of existing defences, to allow time for managed realignment adaptation approaches to be investigated further and implemented.

In the longer term, relocation of the road may be significantly cheaper than options to continue to Hold the line and could achieve wider environmental objectives.

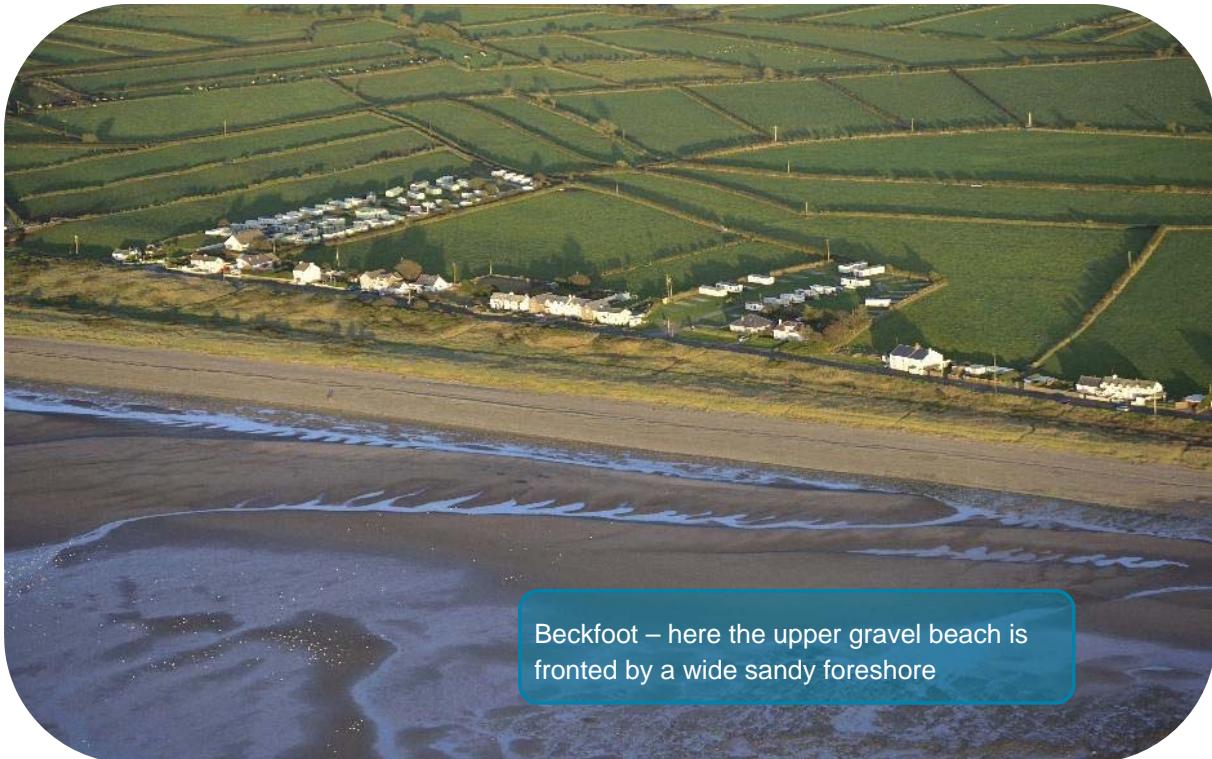
However, a study is still required to consider if abandoning defences at Dubmill Point could have wider reaching impacts on coastal evolution and erosion risk.

We recommend a number of future activities, such as:

- A study to improve understanding of the consequences of managed realignment at Dubmill Point on coastal behaviour.
- Continued monitoring of shoreline change.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- A study to develop short term approach for defences to B5300 at this location.
- Monitoring and management of coastal risks to road users.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e5: Dubmill Point to Silloth



This policy area includes the following policy unit:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|---------------------------------|------------------------|
| Allerdale Borough Council, Cumbria County Council, United Utilities | 11e5.1 Dubmill Point to Silloth | yes |

The policy area lies between the defended headland of Dubmill Point and Silloth Harbour to the north.

Most of the coastline is undefended, but there are defences at Dubmill Point and some local cliff protection defences that protect the public highway (B5300) between Mowbray and Beckfoot.

ⓘ The following sections provide further details for the policy unit ⓘ

11e5.1 Dubmill Point to Silloth (priority unit)

Due to the wide dune systems of Mawbray and Silloth, limited assets are currently at risk along this frontage. Much of the shoreline is undefended but, although some erosion was caused by the winter storms of 2013, during more average years erosion tends to be low. However, there are ‘pinch points’, where the coastal road (B5300) lies close to the current shoreline heritage assets are at erosion risk. There are also some properties within Beckfoot that may become at risk should erosion rates increase.

The existing Shoreline Management Plan policy is for Managed realignment from the short term. This was, however, reliant on further studies into: (1) relocation of the B5300 and (2) the potential wider scale impacts of allowing retreat of Dubmill Point, which may be a control on the adjacent shorelines.

A decision is still to be reached on relocating the B5300. Therefore, in the short term, the preferred approach is to temporarily hold the line, through proactive maintenance and reinforcing defences, to manage the erosion risk to the B5300 at the two erosion pinch points. This will allow time for managed realignment adaptation approaches to be investigated further and implemented.

North of Dubmill Point the shoreline was reinforced with imported rock armour in Spring 2019, along a slightly set back alignment. More substantial works may be required at Castle Corner, such as reconstruction of the present defence to a more appropriate design.

In the longer term, relocation of the road may be significantly cheaper than options to continue to Hold the line and could achieve wider environmental objectives.

However, a study is still required to consider if abandoning defences at Dubmill Point could have wider reaching impacts on coastal evolution and therefore erosion risk in adjacent units.

We recommend a number of future activities, such as:

- Implementation of monitoring and environmental mitigation required for the recent rock armour scheme at Dubmill Point
- A study to improve understanding of the consequences of managed realignment at Dubmill Point on coastal behaviour.
- Progress investigations into future realignment route options for the B5300 (including funding).
- Continued monitoring of shoreline change and inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- A study to develop short term approach for defences to B5300: this needs to consider an extension to the planning permission for the defences at Castle Corner.
- Monitoring and management of coastal risks to road users.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e6: Silloth to The Grune



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|--|------------------------|
| Allerdale Borough Council, private landowners | 11e6.1 Silloth Harbour | no |
| | 11e6.2 Silloth to Skinburness (open coast) | yes |
| | 11e6.3 The Grune | no |

This unit covers the open coastline from Silloth Harbour to the far end of the natural sand and shingle spit known as The Grune. It includes the coastal towns of Silloth and Skinburness.

The shoreline at Silloth and Skinburness is protected by concrete and rock armour defences and the beach features timber groynes across its entire length.

The following sections provide further details for each policy unit

11e6.1 Silloth Harbour

The current Shoreline Management Plan policy is Hold the line by maintaining or upgrading harbour walls where necessary and assumes the harbour remains operational.

Erosion issues here are linked to the natural movement of the outer Solway low water channel, known as The Swatchway. This channel has been moving closer to the shoreline which in turn increases wave and tidal energy at the shoreline.

The Shoreline Management Plan policy seeks to maintain protection to Silloth and we do not think that the policy should change at this time, subject to available funding.

We recommend a number of future activities, such as:

- Continued monitoring of beach and channel changes.
- Continued inspection and maintenance of the existing structures, with repairs and remedial works undertaken as necessary.
- Development of a management plan to indicate the need for advance planning of works, including identification of possible funding sources. Any modification to or replacement of the existing structures would also require consent from Natural England and early discussions are recommended.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e6.2 Silloth to Skinburness (open coast) (priority unit)

Erosion issues along this frontage are linked to the natural movement of the outer Solway low water channel, known as The Swatchway. This channel has been moving closer to the shoreline which in turn increases wave and tidal energy at the shoreline. There are defences all along this frontage which have been erected to prevent erosion of the shoreline and to limit flooding from overtopping

The Shoreline Management Plan policy is to hold the current defence line, which has shown to be marginally economically viable in the long term although upgrades to unlikely to be affordable in the short term. This policy will continue to minimise risks to people, property and infrastructure along the Eastcote to Skinburness frontage.

In the next 10 to 20 years, the preferred strategic approach is to retain the existing defences, either through a Do minimum or proactive management approach. In the longer term, depending on how the beaches change in the future, it is likely that the defences will need to be improved or replaced. Either modifying existing timber groynes or construction of new rock groynes is likely to be the best approach as it would achieve wider benefits for the community. Some beach nourishment is also likely to be required. This approach will, however rely on funding being sought.

We recommend a number of future activities, such as:

- Maintenance of existing defences, asset and coastal change monitoring.
- Develop a better understanding of the level of wave overtopping and breach related flood risk across the flood cell, including from Morecambe Bay, and the likely erosion limits under Do nothing scenario to improve the economic case for future improvements to beach management.

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

11e6.3 The Grune

The current Shoreline Management Plan policy for The Grune is No active intervention to allow natural coastal processes along the International and Nationally designated foreshore and dunes. There are limited assets at risk from coastal erosion or flooding.

We do not think that the policy should change at this time and this would be implemented through a Do nothing approach. There would be a need to monitor changes at the southern end of the frontage.

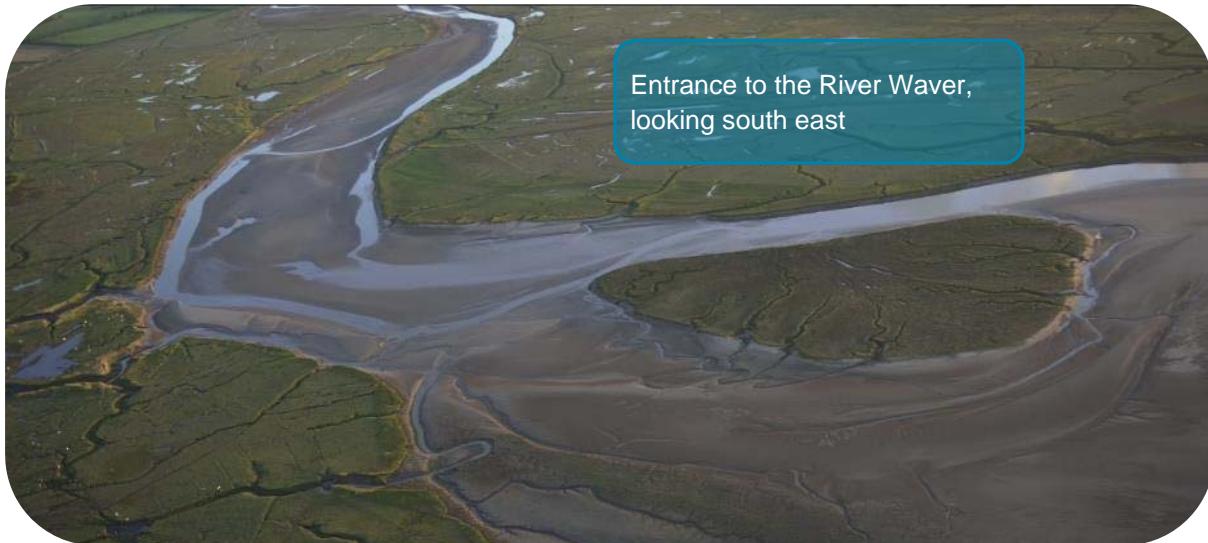
No new defences works or modification to the private defences would be permitted that could have an adverse impact on long term evolutionary behaviour.

We recommend a number of future activities, such as:

- Continued monitoring of shoreline and beach changes.
- Consultation with the landowner with responsibility for the private defences regarding their appropriate future management and consent requirements related to the environmental designations.
- Following a period of further monitoring, review coastal defence requirements at the north end of the Allerdale BC defences at Skinburness to review risk.
- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.

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

11e7 Moricambe Bay



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|---|---|------------------------|
| Allerdale Borough Council, Cumbria County Council, private landowners | 11e7.1 Skinburness (east) | no |
| | 11e7.2 Skinburness to Wath Farm | no |
| | 11e7.3 Wath Farm to Saltcoates | no |
| | 11e7.4 Newton Marsh | no |
| | 11e7.5 Newton Marsh to Anthorn including Wampool to NTL | no |
| | 11e7.6 Anthorn | no |
| | 11e7.7 Anthorn to Cardurnock | no |

This policy area covers the frontage of Moricambe Bay, from the tip of natural sand and shingle spit, known as The Grune, to Cardurnock. The shoreline is characterised by intertidal sand and mudflats, with marshes and reclaimed and improved former marshland behind. Earth embankments align much of the western and southern shorelines (the landward edges of Skinburness and Newton Marsh) to provide flood protection to the low lying agricultural hinterland.

The following sections provide further details for each policy unit

11e7.1 Skinburness (east)

The current Shoreline Management Plan policy is Hold the line and given the potential flood risk to Skinburness, we do not think that the policy should change at this time. The preferred strategic approach is to continue to manage flooding risk from Moricambe Bay to Skinburness through maintaining flood embankments within existing footprints.

There is a need to continue to monitor risk levels, which may change in the future under sea level rise. This may mean there is a need to improve the current defences.

We recommend a number of future activities, such as:

- Regular inspections to assess the condition of the embankment and undertake maintenance and repairs as required.
- Continued monitoring of changes in the extent of marsh and intertidal areas.

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

11e7.2 Skinburness to Wath Farm

The current Shoreline Management Plan policy is Managed realignment in the medium term, with provision of a set back defence. We do not think that the policy should change at this time as it is in line with national and international environmental designations for the site, but further studies are required to support this.

Any landward realignment of the defence may impact on the frequency of high tide flooding of the road (C2052) although parts of it are already seaward of the crest of the bank. The B5302 offers an alternative route but this could have consequences for locals who currently use the Sea Dike Road, with potential for slightly increased traffic on the B5302.

Given the designations along this shoreline, any change in defence alignment would also require consent from Natural England.

The preferred strategic approach is therefore to implement the short term Shoreline Management Plan policy of Hold the line in short term by maintaining and refurbishing defences within current footprints. During this period, studies and consultation are required to consider future realignment options.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Environment Agency, Cumbria County Council (highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential medium to long term relocation of the embankment to adapt to future sea level rise and the implications of this, including impacts of potentially closing the C2052.

- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.

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

11e7.3 Wath Farm to Saltcoates including Waver to Brownrigg

There are no formal defences on the frontage, with the wide marsh giving natural protection. The current Shoreline Management Plan policy is Managed realignment. It is in line with the Area of Outstanding Natural Beauty (AONB) designation and the national and international environmental designations for the site. We do not think that the policy should change at this time, but further studies are required to support this.

There are opportunities to enable expansion of current saltmarsh through a change in land management. For those properties that remain at flood risk, flood adaptation measures should be considered to adapt to future rising sea levels and reduce the impact of flooding and ensure safe exit during extreme events.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas.
- Review risk to the B5307 and consider need for localised works to manage tidal flood risks, if required.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e7.4 Newton Marsh

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with the Area of Outstanding Natural Beauty (AONB) designation and the national

and international environmental designations for the site, but further studies are required to support this.

There are opportunities to enable expansion of current saltmarsh changes in land management. As part of such schemes there may be opportunities to improve resilience of the B5307. Although there is alternative link between Newton Arlosh and Angerton, via Kirkbride, this is the only access to individual properties located along the road. Any such works should, however, look to minimise impacts on the natural flood plain.

For those properties that remain at flood risk, flood adaptation measures should be considered to reduce the impact of flooding and ensure safe exit during extreme events.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas.
- Studies to consider long term viability of the B5307 and alternative options.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e7.5 Newton Marsh to Anthorn including Wampool to NTL

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with national and international environmental designations for the site, but further studies are required to support this.

Along Whirrigg Marsh and Longcroft Marsh there are opportunities to enable expansion of current saltmarsh changes in land management. As part of such schemes there may be opportunities to improve resilience of the coastal road; this sits at the back of the natural flood plain, so any works should not have a significant impact on the functioning of the natural flood plain. Consents would be required from Natural England.

For those properties that remain at flood risk, flood adaptation measures should be considered to reduce the impact of flooding and ensure safe exit during extreme events.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.

- Detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e7.6 Anthorn

The current Shoreline Management Plan policy is for Hold the line along this frontage from the short term. Although there are no formal defences the Shoreline Management Plan proposed that if a need for defences were determined, a revetment should be constructed in front of properties.

Erosion risk depends upon future movement of low water channels. Although there has been reported erosion of the marsh in the past, due to movement of the channel, recent data (although limited) suggests the marsh is currently stable. Therefore, at the present time, the level of risk does not appear to have increased since the Shoreline Management Plan.

Should risks increase in the future, there may be justification for a new defence to be constructed. Given the proximity of the road and properties to the shoreline, there is little opportunity to set back, but construction along the back of the narrow marsh (but seaward of the road) would limit impacts on the natural flood plain.

However, as this is a relatively low energy environment it is recommended that rather than introducing a new rock revetment it may be possible to use or trial the use of more environmentally friendly green solutions to estuary edge protection techniques first.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Should monitoring indicate an increase in risk levels, options would need to be developed. This would involve detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, Natural England and Historic England to appraise the best approach.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e7.7 Anthorn to Cardurnock

The current Shoreline Management Plan policy is Managed realignment from the short term.

There are no formal flood defences present along this coast, but earth embankments are present and for much of this stretch the road is on slightly raised ground. Currently there is a low risk to this frontage from either flooding or erosion, with only short sections of the coastal road (U2002) at flood risk within this policy unit.

Given the proximity of the road and strategically important Anthorn Radio Station to the coast, there is limited opportunity for any habitat creation or for realignment of the road along the frontage between Anthorn and where the coastal road turns inland to Cardurnock. But further west there may be more potential opportunities to enable expansion of current saltmarsh, through a change in land management. This could provide habitat to compensate for loss or damage to intertidal habitats elsewhere in the medium to long term.

We do not think that the policy should change at this time but risks to the coastal road need to be monitored and further studies need to be undertaken to explore habitat creation or enhancement opportunities.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas.
- Monitor risks to the U2002 and impacts on the road of any change in land management.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e8 Cardurnock to Scottish Border



This policy area includes the following policy units:

| Responsibilities | Policy unit number and name | Is it a priority unit? |
|--|--|------------------------|
| Allerdale Borough Council, Carlisle City Council, Cumbria County Council, private landowners | 11e8.1 Cardurnock to Bowness-on-Solway | no |
| | 11e8.2 Bowness-on-Solway | yes |
| | 11e8.3 Bowness-on-Solway to Drumburgh | no |
| | 11e8.4 Drumburgh to Dykesfield | no |
| | 11e8.5 Dykesfield to Kingmoor (Eden NTL) | no |
| | 11e8.6 Kingmoor to Rockcliffe | no |
| | 11e8.7 Rockcliffe | yes |
| | 11e8.8 Rockcliffe to Demesne Farm | no |
| | 11e8.9 Demesne Farm to Metal Bridge (Esk) | no |
| | 11e8.10 Metal Bridge (Esk) to the River Sark | no |

This policy area extends along the southern shoreline of the Solway Firth, from Cardurnock to the River Sark at the border between England and Scotland. It includes the dynamic inner section of the Solway Firth.

There are several settlements, including Bowness-on-Solway, Port Carlisle, Drumburgh, Easton, Boustead Hill, Burgh by Sands and Rockcliffe, strung out along the coastal fringe; many of these are located on slightly higher ground and fronted by extensive saltmarsh, which forms an important natural defence, but flood risk remains an issue for others.

There are very limited formal coastal defences in the area and in most locations the Shoreline Management Plan policy is Managed realignment, allowing for continued natural coastal evolution alongside measures to proactively adapt to future coastal changes and environmental opportunities.

 The following sections provide further details for each policy unit 

11e8.1 Cardurnock to Bowness-on-Solway

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with national and international environmental designations for the site, but further studies are required to support this.

There may be potential opportunities to enable expansion of current saltmarsh, through changes in land management. These habitat creation schemes could be used to compensate for loss or damage to intertidal habitats elsewhere.

Risks to the coastal road also need to be monitored. There is currently marsh and intertidal narrowing, driven by the onshore movement of the Swatchway (River Eden) Channel. The road already experiences occasionally flooding, but frequency of flooding and risk of undermining could increase with sea level rise and if the channel continues to move towards the shoreline, particularly between North Plain and Bowness.

There may be potential to improve resilience of the road as part of implementing a policy of Managed realignment and the possible landward relocation of short stretches of road to higher land, should also be considered.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council, Allerdale Borough Council, Solway Coast AONB and Natural England to consider potential for management changes along the coastal fringe.

- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.

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

11e8.2 Bowness-on-Solway (priority unit)

Bowness-on-Solway is mostly located on an area of relatively high ground and so most properties are not at significant tidal flood risk. The defences provide protection from erosion although most of the properties are slightly set back from the shoreline on higher ground.

The current Shoreline Management Plan policy is No active intervention from the short term, but this allows landowners to maintain informal or private defences if required. However, given that there are existing defences present protecting properties and little or no scope for realignment to a set-back location it is recommended that consideration is given to amending the Shoreline Management Plan policy to Hold the line and moving the boundary with 11e8.3 east to include the existing defended frontage to the east that protects the coastal road and the United Utilities infrastructure. Any change in policy will need to follow a formal Shoreline Management Plan Policy Change process.

A Hold the line option could be marginally economically viable but is unlikely to qualify for a significant proportion of government funding, so alternative funds will need to be sought for works to the defences.

In the short term the proposed strategic approach is to Do minimum, involving patch and repair of existing defences, whilst coastal risks are monitored and a longer term solution investigated.

In the longer term, works may be required to the toe of the defences if the low water channel continue to move landwards. This would be subject to funding and the precise nature of works would be for scheme appraisal stage. It is most likely that it will involve either shoreface works to bolster existing defences or a new larger structure. Both these approaches could impact on important habitats across the intertidal area and we may need to look at where we could compensate for the loss or damage to the area through managed realignment for habitat creation elsewhere.

We recommend a number of future activities, such as:

- Monitoring change in the low water channel and shoreline change.
- Review of potential coast protection scheme and funding viability.
- Liaison between landowners, councils, highways, Solway Coast AONB and Natural England to consider options.
- Longer term plans for the road and United Utilities assets within policy unit 11e8.3 need to be discussed to appraise the need to change the policy unit boundary between 11e8.2 and 11e8.3.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e8.3 Bowness-on-Solway to Drumburgh

The current Shoreline Management Plan policy is Managed realignment from the short term, with most of the shoreline being undefended at present. This is in line with national and international environmental designations for the site, but would mean increasing risks of erosion and flooding to the main coastal road and United Utilities assets. Defences are already in place between Bowness Corner and Knockcross. There is currently no other viable road between Bowness-on-Solway and Port Carlisle (the former route is now a discontinuous track). Rerouting or set back of the road may be possible, but unless a significant realignment is undertaken, the road is likely to remain within the tidal flood risk zone.

Given the scale of investment involved in the new United Utilities wastewater treatment works (WwTW) at Glasson and associated pumping stations it is unlikely that relocation of these assets and road between Bowness and Glasson is likely to be a viable option in the short term. It may therefore be appropriate to move the Shoreline Management Plan policy unit boundary between 11e8.2 and 11e8.3 eastwards to include the defended section of the coastal road and United Utilities assets within 11e8.2 (Bowness-on-Solway), where the policy is Hold the line. This would, however, require a formal Shoreline Management Plan policy change process to be undertaken.

Between Glasson to Drumburgh, there are more opportunities to consider a localised Managed realignment, as the road is located further landward. Here the preferred strategic approach is to implement the Shoreline Management Plan policy of Managed realignment by considering opportunities to allow natural landward expansion of the saltmarsh alongside increasing the flood resilience of the road in future. “Green” estuary edge protection methods and natural defence management should be considered if erosion protection is required to the road.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Longer term plans for the road and United Utilities assets need to be discussed to appraise the need to change the current short term Shoreline Management Plan policy, which could involve changing the unit boundary between 11e8.2 and 11e8.3.
- Continuing monitoring of defences assets between Bowness on Solway and Port Carlisle. Any further works would require consent from Natural England.
- Detailed discussion between landowners, Cumbria County Council, Allerdale Borough Council, Solway Coast AONB, and Natural England to consider

potential for management changes along the coastal fringe, with the view to create more wetland areas, particularly between Glasson and Drumburgh. Any works will need to be undertaken between April and September so as not to disturb the overwintering birds.

- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

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

11e8.4 Drumburgh to Dykesfield

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with national and international environmental designations for the site.

There would, however, be increasing risks of tidal flooding to the main coastal road and it is likely that in the future the road may need to be closed on a more frequent basis, with potential for damage to the road surface.

Erosion is not currently an issue to the road, due to the expanse of saltmarsh, although recent monitoring data does indicate the marsh is narrowing over time due to shoreward advancement of the low water channel. “Green” solutions to manage erosion of the marsh edge if it threatens the road should be considered alongside potential environmental enhancements to create more wetland.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council (including highways), Allerdale Borough Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas, particularly between Easton and Boustead Hill.
- Study to assess best options for addressing long term sustainability of the coastal link road.
- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

11e8.5 Dykesfield to Kingmoor (Eden NTL)

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with the national and international environmental designations for the site. No formal coastal or flood defences present along this frontage but private earth embankments are present in places.

There are opportunities to enable expansion of current saltmarsh through a change in land management.

For those properties that remain at flood risk, such as at New Sandside, flood adaptation measures need to be considered to reduce the impact of flooding and ensure safe exit during extreme events.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Detailed discussion between landowners, Cumbria County Council (including highways), Carlisle City Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas.
- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions

11e8.6 Kingmoor to Rockcliffe

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time to allow opportunities to be sought.

The river course is naturally constrained along part of this frontage. But there could be potential for some localised realignment along the southern extent of low-lying peninsula at Cargo and further north at Carr Bed.

Both would be relatively small sites near the normal tidal limit so there may be infrequent tidal flooding of the sites and habitat diversity could be limited. It is unlikely that sites could be created to compensate any habitat loss or damage elsewhere in the strategy area. There is potential, however, for these to be developed to create flood storage areas, with potential to reduce flood risk further upstream.

We recommend a number of future activities, such as:

- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing and identify sites where we might be able to consider future managed realignment.

- Monitoring of risk to heritage assets, with ongoing liaison with Historic England.

11e8.7 Rockcliffe (priority unit)

The current Shoreline Management Plan policy here is for Hold the line from the short term, to minimise flood risk to Rockcliffe village.

However, there are currently no formal defences along this frontage, so we have only looked at options involving the construction of defences and given the limited properties at risk from flooding, there is limited economic justification for construction of new embankments.

A more suitable approach is therefore considered to be the introduction of temporary defences or individual property adaptation measures to minimise flood risk.

Should residents wish to jointly finance a more permanent solution, the preferred approach would be a set embankment (either earth or low flood wall) adjacent to the road. It is not anticipated that this would be undertaken in next 10 years but this option may become more attractive in future as flood risks increase with climate change.

We recommend a number of future activities, such as:

- Monitoring risk to the frontage -possible responses to the erosion issue along the adjacent unit (11e8.8) need to be taken into account.
- Consider supporting property level protection schemes.

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

11e8.8 Rockcliffe to Demesne Farm

The current Shoreline Management Plan policy is Managed realignment from the short term with specific mention of the need to seek opportunities to reroute or divert undefended coastal road.

A key issue in this area is the risks to the U1068 road, a narrow country lane which links Rockcliffe and Redhill to Castletown. There has been recent slope erosion along part of this stretch. A previous study has been undertaken (by Opus in 2017), which considered a number of possible options to address the risk - these have been considered in this strategy.

Given the limited economic justification for new defences, the recommended strategic approach is for continued monitoring and management of risk to the road, with closure when it becomes unsafe.

We recommend a number of future activities, such as:

- Monitoring the risk to the road due to bank erosion.

- Asset inspections along the road to look for signs of cracking and evidence of subsidence.
- Continued discussions between Cumbria County Council (who are responsible for the road), Carlisle City Council and Rockcliffe Parish council to discuss sustainability of the road and the possibility of combining works to protect the village (considered in unit 11e8.7 and the road).
- Road closure procedures to be put in place: should there be any further slope movement, it may be necessary to close the road at short notice.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

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

11e8.9 Demesne Farm to Metal Bridge (Esk)

The current Shoreline Management Plan policy is Managed realignment from the short term. We do not think that the policy should change at this time as it is in line with national and international environmental designations for the site.

This policy would, however, mean increasing risks of erosion and flooding to the main coastal road. Defences are already in place through the entire length of the frontage, which are believed to be privately managed. These are currently protected by extensive saltmarsh.

There are sites where we could consider realignment for habitat creation. We may need to think about these to offset longer term impacts of building defences elsewhere, but further studies are needed to look at the possible benefits and impacts.

We recommend a number of future activities, such as:

- Monitoring of changes in the extent of marsh and intertidal areas.
- Inspections of coastal defences to update records and provide details of asset properties and potential weaknesses.
- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

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

11e8.10 Metal Bridge (Esk) to the River Sark

The current Shoreline Management Plan policy is Managed realignment from the short term. This is in line with the national and international environmental designations for the site.

Although we do not think that the policy should change at this time, further studies are needed to look at how we continue to protect the M6 motorway and railway. We also need better understanding of how managed realignment could both benefit and impact the wider area.

We recommend a number of future activities, such as:

- Continued monitoring of changes in the extent of marsh and intertidal areas.
- Inspections of coastal defences to update records and provide details of asset properties and potential weaknesses.
- Detailed discussion between landowners, Cumbria County Council (including highways), Carlisle City Council, Solway Coast AONB, and Natural England to consider potential for land management changes along the coastal fringe, with the view to creating more wetland areas. Due to proximity to Scottish border, discussions should also involve the Dumfries and Galloway Council, Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES).
- Monitoring of risk to historical assets and liaison with Historic England to enable sufficient time for recording and, where appropriate, collection of finds.
- An estuary-wide study looking at future gains and losses in marsh and flats. This would improve our understanding of how the estuary is changing, identify sites where we might be able to consider future managed realignment and assess impacts on the English and Scottish coasts.

It is important to note that recommended activities might be subject to funding and resources available to take them forward. Recommended schemes will be subject to more detailed scheme level appraisal of options and appropriate consents and permissions.

