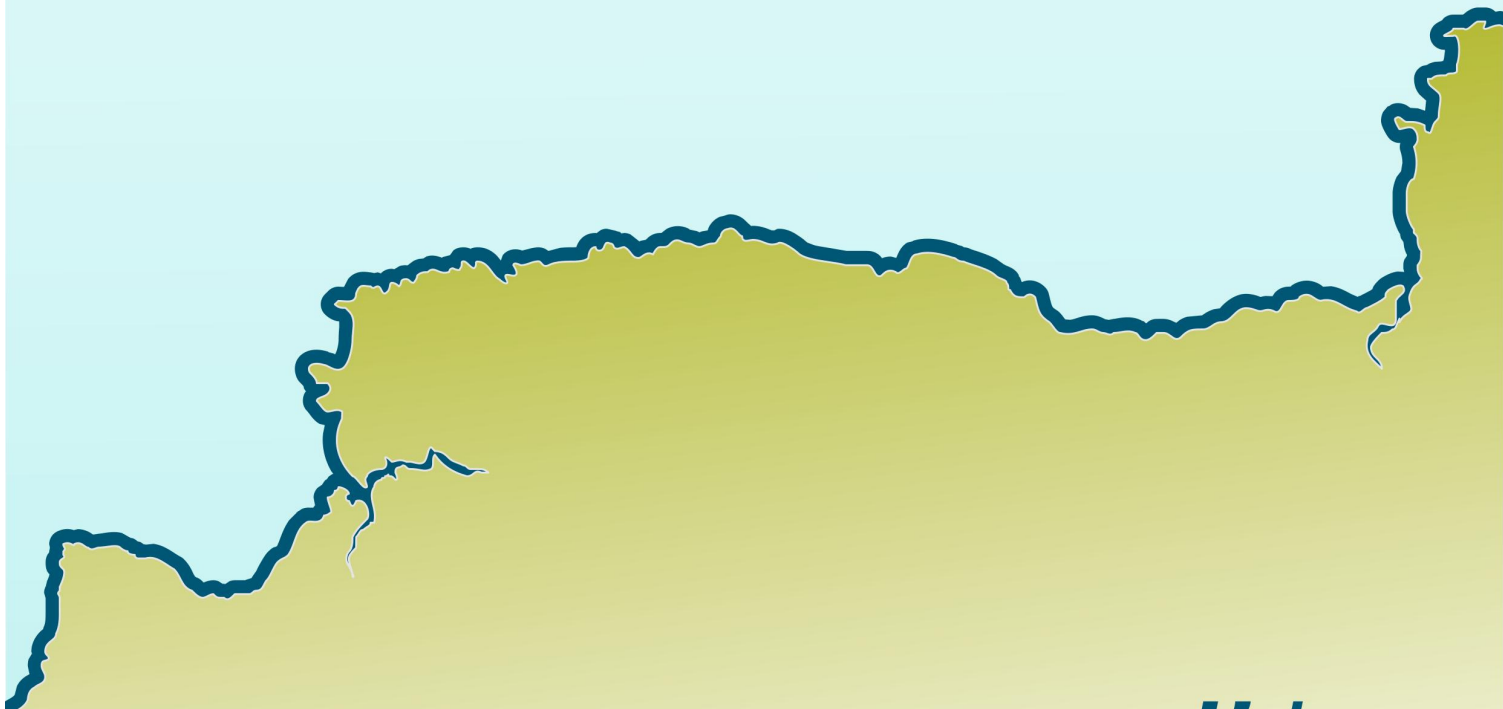


# North Devon and Somerset Coastal Advisory Group (NDASCAG)

## Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head

Appendix G – Preferred Policy Scenario Testing

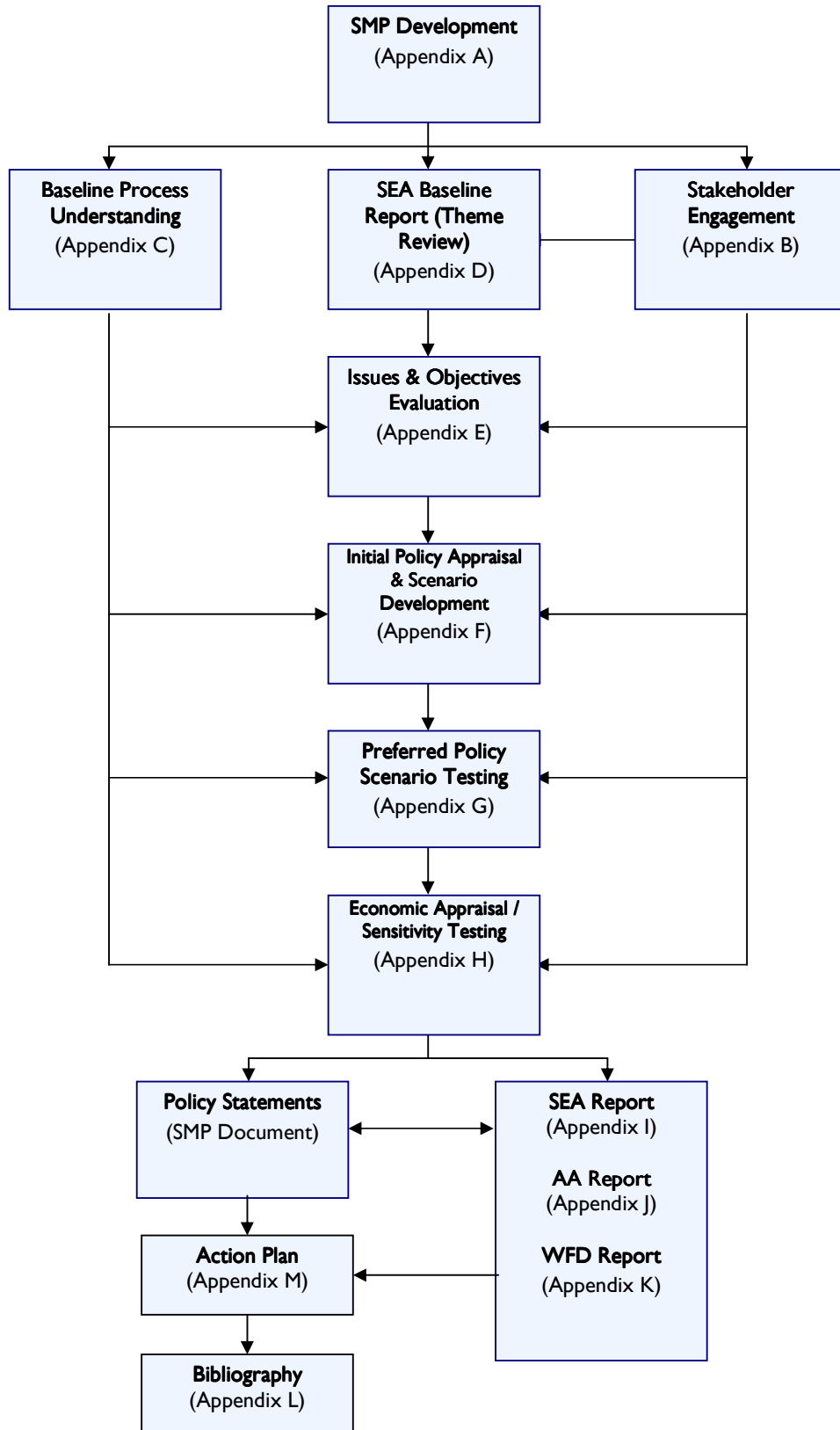


## The Supporting Appendices

These appendices and the accompanying documents provide all of the information required to support the Shoreline Management Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The appendices are:

A: SMP Development	This reports the history of development of the SMP, describing more fully the plan and policy decision-making process.
B: Stakeholder Engagement	All communications from the stakeholder process are provided here, together with information arising from the consultation process.
C: Baseline Process Understanding	Includes baseline process report, defence assessment, NAI and WPM assessments and summarises data used in assessments.
D: SEA Environmental Baseline Report (Theme Review)	This report identifies and evaluates the environmental features (human, natural, historical and landscape).
E: Issues & Objectives Evaluation	Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
F: Initial Policy Appraisal & Scenario Development	Presents the consideration of generic policy options for each frontage, identifying possible acceptable policies, and their combination into 'scenarios' for testing. Also presents the appraisal of impacts upon shoreline evolution and the appraisal of objective achievement.
G: Preferred Policy Scenario Testing	Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
H: Economic Appraisal and Sensitivity Testing	Presents the economic analysis undertaken in support of the Preferred Plan.
I: Strategic Environmental Assessment (SEA) Report	Presents the various items undertaken in developing the Plan that specifically relate to the requirements of the EU Council Directive 2001/42/EC (the Strategic Environmental Assessment Directive), such that all of this information is readily accessible in one document.
J: Appropriate Assessment Report	Presents the Appropriate Assessment of SMP policies upon European designated sites (SPAs and SACs) as well as Ramsar sites, where policies might have a likely significant effect upon these sites. This is carried out in accordance with the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations).
K: Water Framework Development Report	Presents assessment of potential impacts of SMP policies upon coastal and estuarine water bodies, in accordance with the requirements of EU Council Directive 2000/60/EC (the Water Framework Directive).
L: Metadatabase and Bibliographic database	All supporting information used to develop the SMP is referenced for future examination and retrieval.
M: Action Plan Summary Table	Presents the Action Plan items included in Section 6 of the main SMP document (The Plan) in tabular format for ease of monitoring and reporting action plan progress.

Within each appendix cross-referencing highlights the documents where related appraisals are presented. The broad relationships between the appendices are illustrated below.



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## G.1 Introduction

This document provides a summary of the preferred policies that have been identified through the policy appraisal process of the Hartland Point to Anchor Head Shoreline Management Plan (SMP). These policies have been identified through the assessment of impacts upon coastal processes and the features, issues and objectives identified in Stage 2 of the SMP process (refer to **Appendix F**), review of economics and sensitivities (refer to **Appendix H**), and through subsequent discussion and agreement with the North Devon and Somerset Coastal Advisory Group to take forward to consultation.

The table below (Section G.2) summarises the proposed final policy units, the preferred policy identified for each epoch for each unit, a brief summary of the assumptions including how the policy could be implemented, and the key potential impacts and implications of the proposed preferred policy.

For ease of reference, **Annex G.1** at the end of this document gives a more concise summary of the preferred policies that have been identified to date including briefly key implications and key supporting information that has been considered in selecting the preferred policies. However, it is imperative that the detail behind the concise summary provided in this document and the **main SMP** document is read to fully understand and appreciate what is being proposed.

In order to provide clarity, the remainder of this section (Sections G.1.1 and G.1.2) provide an overview of how the final policies have been derived, and where they have been amended following the responses from the public consultation.

### G.1.1 Development of Draft Policies

The policies included in the consultation draft of the SMP were identified through the assessment of impacts upon coastal processes and the features, issues and objectives identified in Stage 2 of the SMP process (refer to **Appendix F**), review of economics and sensitivities (refer to **Appendix H**), and through subsequent discussion and agreement with the North Devon and Somerset Coastal Advisory Group to take forward to consultation.

As stated, these preferred policies were agreed with the North Devon and Somerset Coastal Advisory Group following comments upon the proposed preferred policies (**Appendix F**), and discussion with elected members and key stakeholders at a series of Key Stakeholder Events held in July 2009 (refer to **Appendix B**).

The majority of comments received requested additional detail about how policies may be implemented, and provided alternative suggestions for immediate measures that could be carried out in the short term that would not be detrimental to the long term plan. However, a number of policies were changed following the July 2009 round of stakeholder engagement. The main changes to the preferred policies resulting from these comments and discussions were:

- Following provision of details of proposals to redevelop and regenerate the Ilfracombe Harbour area, the policy for **Ilfracombe** was modified to support localised 'Advance the Line' as being a possible means of achieving the long term Plan in this area.
- Following discussion with The National Trust, and provision of further information about a Defra funded study to investigate land use adaptation in this area, the initial proposed policy for **Porlock Weir to Hurlstone Point** has been changed from Managed Realignment to No Active Intervention for all three epochs.
- The policy for the short term at **Dunster Beach** was changed from Hold the Line to Managed Realignment to provide clarity over what would be anticipated to be funded from the flood and coastal defence budget, and what would be permitted in terms of privately funded measures along this frontage.
- In the **Parrett Estuary**, notably between Comwich and Bridgwater (west bank) and Dunball to the River Brue (east bank), the timing of the move from a policy of Hold the Line to Managed Realignment was changed from occurring in the medium term to the long term. This change followed discussion with the Environment Agency's project manager for the Parrett Estuary Flood Risk Management Strategy, as short term measures to be taken as a result of the strategy will make realignment more feasible in the long term rather than the medium term.
- Between **Berrow and Brean**, the short term policy was altered from Managed Realignment to Hold the Line, as it was felt that active dune management in this period would also likely retain the current

shoreline position rather than managing its realignment in this period. The medium and long term policy of Managed Realignment was retained along this section.

- The long term policy for the coast between **Brean and Brean Down** and along the **west bank of the Axe Estuary** is subject to significant uncertainty and as such the long term policy was amended to include potential to either continue to Hold the Line or move towards No Active Intervention.

In addition to the above changes to policies, a number of units were also re-named in order to more clearly describe some units.

### G.1.2 Changes to Policies following Public Consultation

Following the completion of the public consultation phase in January 2010, all comments were reviewed and amendments made to the SMP documents. The full details of all changes made are included in **Appendix B**. However, for ease of reference, the key significant changes relating to policies and policy units are summarised in the following:

- **Taw/Torridge Estuary** – there are a number of policy units in the Taw/Torridge Estuary where there is potential for managed realignment that could impact upon assets such as the Tarka Trail. The policy statements in these areas have been amended to reflect the potential for realignment to involve either realignment of the assets or tidal exchange through the assets. This has not required the policy of Managed Realignment itself to be changed in these areas.
- **Instow (formerly 7c15)** – The unit has been split into 2 parts to differentiate between hard defence frontage and dune frontage. The hard defence frontage retains a policy of Hold the Line for all three epochs. The dune frontage has been assigned a policy of Managed Realignment for all three epochs to reflect that the primary management here is likely to be dune management, although mentioning the possible need for a set-back defence if the defence function of the dunes becomes reduced in the future. The overall intent to continue to protect Instow has not changed.
- **Home Farm Marsh to Fremington (formerly 7c17)** – The unit has been split into 2 parts to differentiate between frontage where realignment potential is likely (Home Farm Marsh) and where the policy already says that defences are likely to be retained under Hold the Line (Fremington). This makes what is intended in each area clearer.
- **Penhill Point to A39 (formerly 7c19)** – The unit has been split into 2 parts to differentiate between the northern part where some form of realignment (likely exchange through the Tarka Trail) may be possible) and the frontage towards the A39 where ongoing defence is required to protect the developed area at Bickington.
- **Watermouth (7d08)** – Having revisited the information in this area, and to be consistent with other areas where defences are privately owned, the policy has been changed to No Active Intervention for all three epochs but with the clear statement that there is no technical reason not to allow continued defences here if private owners wish to maintain them.
- **Porlock Weir (7d16)** – The defences here are privately owned and the owner has indicated intent to maintain (and possibly improve) the existing defences. To be consistent with other areas where defences are privately owned, the policy has been changed to No Active Intervention for all three epochs as there is insufficient economic justification to maintain these defences using public (flood and coastal defence budget) funds. However, the policy statement is clear that retention of private defences could continue if desired so long as they can be demonstrated to not have an adverse effect on the rest of Porlock Bay. The revised text retains the uncertainty about how sustainable this will prove to be in the medium to long term as it is thought that to provide adequate defence in the medium to long term will require larger defences over a longer extent of shoreline. The text therefore maintains that consideration may need to be given to adaptation measures in this area in the long term.
- **Minehead and Dunster (7d19, 7d20, 7d21)** – Having undertaken further review of the information, the policy here has been modified to be Hold the Line in the immediate term through beach recycling/short timber groynes (at Dunster) and replacement of embankment (at golf course), whilst undertaking a strategy study to look at the bigger picture, including potential issues with the terminal groyne at Minehead. Construction of a secondary defence line (seaward of West Somerset Railway) as back up to the beach will still be required under this policy as it is uncertain that the standard of protection beach

management along the Dunster frontage alone will be adequate to reduce risk of backdoor flooding to Minehead.

In the medium term Hold the Line would continue for as long as technically and economically sustainable through continuing beach management, but this may well become unsustainable in this period, at which time the policy would move to Managed Realignment. At this point the secondary defence line constructed in the short term would become the primary defence line. Limited beach management to control roll back/minimise breach risk in this period could also be considered under this policy.

The long term policy will be similar to the medium term, reflecting uncertainty on the timing of the change to the realignment policy. Ultimately the long-term vision of the Plan for this area is to provide flood defence in a realigned position. If realignment occurs in the medium term, then the policy in the long term would be to maintain the realigned defence position under Hold the Line. If realignment did not occur in the medium term then it will be likely to occur in the long-term.

- **Doniford to St Audries Bay (7d26)** – Having undertaken further review of the information, and to be consistent with other areas where defences are privately owned and maintained, the policy here has been modified to be No Active Intervention as there is not likely to be a robust economic case to use public funds for defence of this area. However, the revised text clearly states that if the private defence owner wishes to continue to defend this area using private funds, then there is no technical reason not to permit it. The revised text does, however, retain concerns about how sustainable this will be even using private funds.
- **Hinkley Point (7d31)** – The policy here has been amended to reflect both current scenarios for the expansion of Hinkley Point as they are currently understood.
- **Stearr Peninsula (7d34 to 7d37), Parrett Estuary (7d38 to 7d42) and Burnham-on-Sea and Highbridge (7d43)** – The policies here have been reviewed and amended to reflect the emerging findings of the Stearr Coastal Management Project. This review has been carried out with the Stearr project team to ensure consistency is achieved and has resulted in slight changes from the consultation draft of the SMP. Notably, the policy unit boundary between units 7d36 and 7d37 has been moved to now be at the point north of Combwich where the national grid power lines are situated. The policies in these two units are, however, as per the draft policies but in revised unit extents. No other changes to policy have been made in this area.
- **Burnham to Brean Down and the Axe Estuary West Bank (7d43 to 7d45 and 7e02)** – Having undertaken further review of all the information for this area, it is felt that the policies are broadly correct, although the long term policy for the Axe Estuary West Bank and the revetment frontage towards Brean Down has been changed from No Active Intervention to Managed Realignment to make it clearer what is intended in terms of requiring a set-back defence position as part of the future management of this area. Suggestion has also been added in the medium term to the possibility of implementing managed realignment along the Axe Estuary west bank in that period.

The only other change along the frontage has been to the position of the policy unit boundary towards Burnham-on-Sea (boundary between 7d43 and 7d44) which has been moved south to the boundary of the hard defences at the north end of Burnham sea front and the dunes. This is in line with the Black & Veatch (2008) management units and better reflects the different nature of the frontages.

The policy statements in this area have also been reviewed and updated to attempt to make the policies clearer.

- **Uphill (7e05)** – the policy for the dunes at Uphill has changed to be one of Managed Realignment to make it clear that dune management for defence purposes could occur if required based upon ongoing monitoring. This policy would apply for all three epochs to reflect that the primary management here is likely to be dune management that will manage the advance or retreat of the shoreline, although mentioning the possible need for a set-back defence if the defence function of the dunes becomes reduced in the future.

In addition to these more significant changes, small adjustments to policy unit boundary lines, unit names and clarification to policy statement text have been made.

## G.2 Preferred Policies Summary Table

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<b>POLICY SCENARIO AREA: LUNDY</b>			
<p>Lundy is located in the Bristol Channel, mid way between South Wales and North Devon, sited approximately 18km off Hartland Point. The island is a horizontal plateau of granite 5km long by 1km wide, surrounded by 15km of coastline of steep slopes and cliffs rising approximately 110m from the sea.</p> <p>The western cliffs are very exposed and therefore sparsely vegetated; this habitat supports a variety of breeding sea birds. The eastern cliffs are more sheltered and vegetated; supporting the Lundy cabbage, a protected species endemic to Lundy. The land and waters of Lundy are ecologically rich and contain sites of national and international importance including a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). It is also has a Marine Nature Reserve with an established zoning system including Britain's first ever 'no take' zone, this is a Marine Protected Area where there is no fishing or collection of wildlife. The Braunton Burrows UNESCO Biosphere Reserve's transition zone also stretches out to Lundy.</p> <p>People have lived on Lundy since prehistoric times providing an abundance of archaeological history throughout the ages, much unrecorded. Lundy has thirteen Scheduled Monuments and two nationally protected ship wrecks. Agriculture is the dominant land use of the island and Lundy is a popular visitor destination throughout the year, which supports the Island's economy.</p> <p>The long-term Plan for Lundy is to continue allowing it to evolve naturally, while maintaining sea defences that protect the access via Landing Bay.</p>			
<b>7c01 – Landing Beach</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	At Landing Bay, defences include a concrete seawall with masonry splash wall, a concrete breakwater and stone gabion revetments. These structures will need to be improved (re-built with larger structures) during this period, along with implementation of cliff stabilisation measures, in order to maintain the standard of defence.	The various defences and cliff stabilisation measures will require ongoing maintenance during this epoch.	The various defences and cliff stabilisation measures will require ongoing maintenance during this epoch. Further improvements could be required towards the end of this epoch, as some defences reach the end of their design life.
	It is unlikely that these defences would attract public funding; however, the defences are vital to retaining the only access link from the coast to the rest of the island.		
	This section is the only defended section of coast on Lundy Island, with defences located at the back	The pocket beach at Landing Bay is reliant on incoming sediment from the cliffs the adjacent	Some beach steepening and narrowing, and possible submergence, at Landing Bay is expected



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>of the pocket beach at Landing Bay. These defences will need to be improved during this epoch, and likely require cliff stabilisation measures to be implemented, in order for these defences to continue to prevent toe erosion of the soft shale cliffs and reduce the risk of cliff recession, such that the only access road to the rest of the island can be maintained.</p> <p>Continued slow erosion of adjacent undefended granite and slate cliffs would continue to provide sediment inputs to the pocket beach in this area during this epoch, although the total amount of sediment supply will not be realised as continued defence will limit the erosion of cliffs at the back of Landing Beach that would otherwise supply further sediment.</p>	<p>undefended cliffs. The continued maintenance of defences along this section will reduce cliff erosion along this stretch and therefore reduce the local input of sediment to the fronting beach, which will therefore be less than would otherwise be expected Therefore the beach may become increasingly vulnerable to erosion or submergence with sea level rise.</p>	<p>as a result of sea level rise and the reduced input of new sediment from cliff erosion as a result of ongoing maintenance of the defences.</p>
7c02 – Lundy Island (except Landing Beach)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	The majority of Lundy Island, as covered by this section, consists of undefended cliffs, and these would continue to evolve naturally.	No defences.	No defences.
	<p>The resistant granite cliffs have historically been eroding very slowly. In the future it is predicted that recession will continue to occur at similar historic rates such that there would be negligible change along most of this coastline during this epoch.</p> <p>Along the south-east of the island, soft slates are</p>	<p>Erosion of the granite cliffs will continue to occur at very low rates, with negligible change expected around the majority of the island; in isolated areas, where softer slates are exposed, up to 10m of recession is possible as a result of small scale, infrequent rock falls. There could be loss of some isolated pocket beaches, as they become</p>	<p>The resistant granite cliffs have historically been eroding very slowly. In the future it is predicted that recession will continue to occur at similar historic rates such that this frontage would change negligibly during this epoch, with up to 10m of recession possible in isolated areas, where softer slates are exposed, as a result of small</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>exposed and these are more prone to erosion, with up to 10m of recession possible due to infrequent rock falls. Erosion of these softer cliffs will provide material to the small pocket beaches, which are predicted to remain relatively stable.</p>	<p>submerged</p> <p>Although sea level rise will increase exposure of the cliffs, the resistant nature of the granite cliffs means that it is unlikely to affect the erosion rate. Where small pocket beaches lie at the toe of these cliffs, these could become submerged and lost under a scenario of sea level rise.</p> <p>Where the softer slates outcrop, sea level rise could potentially increase erosion rates slightly, although sediment would be supplied to the fronting beaches, which would provide some toe protection.</p>	<p>scale, infrequent rock falls.</p> <p>Sea level rise may cause erosion rates along the softer slate cliffs to increase as the cliffs become increasingly exposed to wave action. Material supplied from this erosion may be retained locally as small beaches.</p>

**POLICY SCENARIO AREA: HARTLAND POINT TO WESTWARD HO!**

This section of coast represents the southern half of Bideford Bay, starting at the prominent headland of Hartland Point and finishing 20km northeast at Westward Ho!, mid way along the Bideford Bay.

Hartland Point is renowned for its spectacular red cliffs composed predominantly from Devonian Old Red Sandstone, remnants of the desert climate in the Permian period (Exmoor and the Quantock Hills Natural Areas, 1997). The cliff tops from Hartland Point to Clovelly support a mosaic of habitats and, together with the geology of this stretch, form part of the wider Marsland to Clovelly Coast SSSI and Tintagel- Marsland-Clovelly Coast SAC. Further along the coast, adjacent to Bideford between Mermaids Pool and Rowdens Gut, is the only complete sequence of the Bideford Formation; this notable geology is a designated SSSI. This section also forms part of the wider UNESCO Biosphere buffer and transition zone.

This picturesque coastline attracts many visitors and has national status as the North Devon Area of Outstanding Natural Beauty (AONB), Hartland Heritage Coast and Coastal Preservation Area. Hartland, Clovelly and Bucks Mill are Conservation Areas and there are Scheduled Monuments sparsely spread along the coast including hill forts and earthworks. Land use inland of the wooded cliffs and maritime heathland is predominantly agricultural with fields bounded by hedgerows. Culm grassland is present forming pastures and moors of unimproved rushy grassland and poorly draining soils. This coastline is accessible by the South West Coast Path.

This coast is largely undefended with very little at risk of erosion or flooding. The Plan for the long term is therefore to continue allowing the coast to evolve naturally along much of its length.

However, continued defence will be needed at Clovelly to retain this important tourism centre that also benefits the economy of the wider area. Retention of Clovelly's defences is likely to be economically viable and unlikely to affect wider coastal processes, provided the current annual transfer of pebbles from the west to east continues. Retaining defences at Bucks Mill is also unlikely to affect wider coastal processes, but future provision of defences here is unlikely to attract public funds from the flood and

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
coastal defence budget, and will therefore depend on the availability of other funds.			
7c03 – Hartland Point to Clovelly	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section of coast is undefended.	No defences.	No defences.
	<p>The cliffs along this coastline are generally cut into interbedded sandstones and shales, which have been subject to faulting and folding in the geologically past. As a result, the cliffs are subject to different rates of erosion, with some stretches being fairly resilient to erosion and other stretches prone to large landslips. The shales tend to be more easily eroded than the sandstones but rates of erosion also depend upon the bedding and the degree of faulting and folding.</p> <p>Overall, this coastline has generally experienced low rates of erosion and this trend is expected to continue in the future, such that generally this frontage will maintain a similar form during this epoch. Along much of this coastline erosion is likely to be less than 10m over the next 20 years. However, certain stretches may be prone to landslip events, which could cause between 10 and 50m during a single event.</p> <p>Narrow cobble and gravel beaches are present at the toe of the cliffs. To the west of Chapman Rock these tend to be confined to small pocket beaches, but to the east they become more continuous, forming a barrier beach. Much of this material is likely to be relict, but cliffs may also input some material to the beaches. The coarser</p>	<p>Much of this coast will continue to erode slowly, with less than a total of 25m expected by year 50. However, there is a risk of localised landslide events, which could result in up to 10 to 50m of erosion during a single event. Areas where shales outcrop and previous landslips are evident are most at risk. Sea level rise is predicted to increase erosion rates along these softer cliffs as the cliffs come under increasing attack due to higher water levels. The frequency of landslips may also be affected by any increase in rainfall resulting from future climate change; however, due to uncertainty in the possible future changes in precipitation, no direct account has been taken of this in the predictions.</p> <p>Erosion of the cliffs will supply sediment to the beaches, although much of the material that makes up these cobble and gravel beaches is essentially relict. Finer material will be transported westwards and either deposited on the intermittent beaches or transported west beyond Hartland Point to be recirculated within the Bideford Bay circulatory system.</p> <p>The pocket beaches along the frontage to the west of Chapman Rock are self-contained; therefore they are predicted to remain stable</p>	<p>Continual slow erosion of the cliffs is expected along much of this frontage; although there is a risk of isolated landslips where softer rocks outcrop. Here the risk of landslips will increase due to sea level rise and any change in precipitation patterns.</p> <p>Where the coast is backed by resistant cliffs, sea level rise is unlikely to affect the rates of erosion. Up to 50m may be expected along much of the frontage, but this will vary according to the local geology, which varies due to the complex pattern of faulting and folding along this stretch of coast. In a single landslip event up to 10 to 50m of erosion could occur.</p> <p>Although the beaches are mainly relict and composed of gravel and cobble, any erosion of the cliffs may contribute to their stability. As sea levels rise, some of the smaller pocket beach along the western end of this frontage may become submerged, but along the rest of the frontage beaches are likely to be retained, but due to the predicted increase in water levels may be narrow and become more volatile as larger waves will be able to reach the upper beach on a more frequent basis.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>material will tend to remain locally and be moved very slowly along in a net eastwards direction, with the finer sediments transported further eastwards to be recirculated within the Bideford Bay circulatory system.</p> <p>During this period both the barrier beaches and the pocket beaches are likely to remain relatively stable.</p>	<p>during this epoch as eroded sediment is retained locally.</p>	
7c04 – Clovelly	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>This section of coast covers the coastal frontage of the village of Clovelly, which rises steeply inland from the coast. Defences at Clovelly comprise of harbour structures (breakwater) and a seawall. These defences provide localised erosion protection for the resistant inter-bedded sandstone and shale cliff, as well as provide flood protection to the low-lying properties situated at coastal frontage of Clovelly.</p> <p>These defences will require maintenance during this period to ensure that they continue to provide an adequate level of protection.</p>	<p>The defences at Clovelly will need to be upgraded during this period. This is likely to involve re-building the existing structures to be much larger such that they are able to provide the required level of protection in the future as sea level rise and other climate change impacts occur.</p> <p>The harbour arm at Clovelly is an historic feature, and so rather than re-building this structure, consideration should be given to building a new structure (possibly a rock revetment) around the outside of the existing structure so as to provide the required level of protection in the future whilst also preserving this historic feature.</p>	<p>The defences at Clovelly, re-built in the medium term, would continue to be maintained during this period.</p>
	<p>At Clovelly there is currently a small harbour enclosed by breakwaters and backed by a seawall. These structures will continue to afford protection to the enclosed beach and backing infrastructure as they are maintained throughout this period. The harbour structures will therefore continue to affect the net eastwards drift of</p>	<p>At Clovelly, the harbour structures and seawall are expected to need to be re-built during this period, to be much larger structures than at present such that they are able to provide the require levels of protection in the long-term as overtopping becomes more frequent with sea level rise. A possible alternative to this could be</p>	<p>The structures at Clovelly will continue to affect alongshore transport along this stretch, with sediment being held to the west of the harbour arm. The harbour arm will also protect the enclosed beach area. However, some beach narrowing may occur as a result of higher sea</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>sediment, but are only likely to have a very local effect as Clovelly sits within a slight natural embayment.</p> <p>The continued presence of these defences will also continue to reduce erosion of the cliffs locally, though this impact is unlikely to be significant in terms of preventing sediment entering the shoreline system.</p> <p>The beaches in this area are a continuation of the barrier beaches to the west, and these are likely to remain relatively stable in this period.</p>	<p>to construct a rock revetment structure around the outside of the existing harbour arm to dissipate wave energy.</p> <p>The harbour arm will continue to trap sediment and protect the enclosed beach, although a reduction in incoming sediment due to sea level rise may result in some cutback at the northern end. However, due to the slight natural embayment, and the shelter afforded from westerly conditions, sufficient beach is expected to be retained along this frontage to provide coastal defence.</p>	<p>levels.</p> <p>The frontage may also become more exposed to wave attack due to sea level rise, but the cliffs backing this frontage are very resistant and therefore unlikely to change.</p>
7c05 – Clovelly to Westward Ho! (Seafield House)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>This section of coast is largely comprised of undefended cliffs apart from localised defences at and Bucks Mill (gabions and seawall).</p> <p>It is unlikely that these defences would attract public funds for maintenance and improvements likely to be required to provide current levels of protection as sea levels rise. However, if alternative funds were available for this purpose, there is no reason not to permit their retention from a processes point of view.</p>	<p>If funds are not available to maintain and replace the defences at Bucks Mill (gabions and seawall), these may fail towards the end of this epoch.</p> <p>The majority of this frontage is comprised of undefended cliffs and these will continue to evolve naturally.</p>	<p>If not maintained due to lack of funding, the defences at Bucks Mill would not be present during this period, and as such, the coast will evolve naturally along with the majority of this undefended section of cliffed coastline.</p>
	<p>The cliffs along this coastline are generally cut into interbedded sandstones and shales, which have been subject to faulting and folding in the geologically past. As a result, the cliffs are subject to different rates of erosion, with some stretches being fairly resilient to erosion and other</p>	<p>Much of this coast will continue to erode slowly, with less than a total of 25m expected by year 50. However, there is a risk of localised landslide events, which could result in up to 10 to 50m of erosion during a single event. Areas where shales outcrop and previous landslips are evident are</p>	<p>Continual slow erosion of the cliffs is expected along much of this frontage; although there is a risk of isolated landslips where softer rocks outcrop. Here the risk of landslips will increase due to sea level rise and any change in</p>

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	<p>stretches prone to large landslips. The shales tend to be more easily eroded than the sandstones but rates of erosion also depend upon the bedding and the degree of faulting and folding.</p> <p>Overall, this coastline has generally experienced low rates of erosion and this trend is expected to continue in the future, such that generally this frontage will maintain a similar form during this epoch. Along much of this coastline erosion is likely to be less than 10m over the next 20 years. However, certain stretches may be prone to landslip events, which could cause between 10 and 50m during a single event.</p> <p>Narrow cobble and gravel beaches are present at the toe of the cliffs, and along this section this is continuous, forming a barrier beach between Clovelly and Babbacombe, where after the beaches become confined to small local pocket beaches fronted by foreshore rock platforms. Much of this material is likely to be relict, but cliffs may also input some material to the beaches. The coarser material will tend to remain locally and be moved very slowly along in a net eastwards direction, with the finer sediments transported further eastwards to be recirculated within the Bideford Bay circulatory system.</p> <p>During this period the beaches along this stretch are likely to remain relatively stable.</p> <p>At Buck Mills there is a short stretch of seawall</p>	<p>most at risk. Sea level rise is predicted to increase erosion rates along these softer cliffs as the cliffs come under increasing attack due to higher water levels. The frequency of landslips may also be affected by any increase in rainfall resulting from future climate change; however, due to uncertainty in the possible future changes in precipitation, no direct account has been taken of this in the predictions.</p> <p>Erosion of the cliffs will supply sediment to the beaches, although much of the material that makes up these cobble and gravel beaches is essentially relict. Finer material will be transported westwards and either deposited on the intermittent beaches or transported west beyond Hartland Point to be recirculated within the Bideford Bay circulatory system.</p> <p>If not maintained due to lack funds, failure of the short stretch of seawall and gabions at Bucks Mills would occur during this period. There could therefore be increased wave action at the toe of the cliffs and a risk that loss of these structures could result in reactivation of the cliffs behind, where a landslip occurred in 1989. The impact would, however, be very localised.</p> <p>However, if alternative funds are available, then the defences at Bucks Mills would need to be upgraded (re-built) during this period in order continue to provide localised protection and so reduce the risk of localised erosion occurring.</p>	<p>precipitation patterns.</p> <p>Where the coast is backed by resistant cliffs, sea level rise is unlikely to affect the rates of erosion. Up to 50m may be expected along much of the frontage, but this will vary according to the local geology, which varies due to the complex pattern of faulting and folding along this stretch of coast. In a single landslip event up to 10 to 50m of erosion could occur.</p> <p>Although the beaches are mainly relict and composed of gravel and cobble, any erosion of the cliffs may contribute to their stability. As sea levels rise, some of the smaller pocket beaches along this frontage may become submerged, but along the rest of the frontage beaches are likely to be retained, but due to the predicted increase in water levels may be narrow and become more volatile as larger waves will be able to reach the upper beach on a more frequent basis.</p> <p>At Buck Mills, if alternative funds are available, ongoing maintenance of the defences would provide continued protection of the cliff toe and reduce the risk of landsliding; however, outflanking will increasingly become an issue as a result of erosion of the undefended cliffs to the west. Therefore it is likely to become technically more difficult to maintain the current defences.</p> <p>If alternative funds are not available for this purpose, then this section would evolve in a</p>

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	<p>and gabions associated with access to the beach. These structures are assumed to remain during this period and will therefore continue to afford protection to the enclosed beach and backing infrastructure.</p> <p>However, it is unlikely that these defences would attract public funds to be maintained during this period, although if alternative (private) funds are available for this purpose, there is no reason not to permit retention of these defences during this epoch as it will have no adverse effect in terms of coastal processes.</p>	<p>The section of defence here is short and therefore it is unlikely to be affecting large scale processes in terms of sediment inputs or alongshore transport; however continuing to defend here may become technically more difficult, particularly if the undefended cliff immediately to the west undergo further recession.</p>	<p>similar way to the rest of the undefended coast, with similar rates of cliff recession.</p>
<b>POLICY SCENARIO AREA: WESTWARD HO! TO SAUNTON DOWN</b>			
<p>This section of coast is approximately 10 miles long, encompassing the northern and eastern part of Bideford Bay, and incorporating the outer part of the Taw and Torridge Estuary system. Westward Ho! is a significant coastal resort located at the southern-most point of the estuary with Saunton Down headland forming the northern-most point. This section of coast also encompasses the Taw/Torridge Estuary. The Estuary has two main tributaries: the River Taw and the River Torridge. The intertidal habitats within the estuary are a designated SSSI. The River Torridge runs in a southerly direction parallel to the coast and the port town of Bideford has developed along both banks, approximately 5km upstream from its mouth. The River Taw runs in an easterly direction perpendicular to the coast, with the small tributary of the River Caen joining it at Braunton and an earth heritage SSSI at Fremington Quays. The river meanders inland and the historic market town of Barnstaple is located along both banks of the river, approximately 5km from the mouth.</p> <p>This area is characterised by a wide range of habitats influenced by the coastal geomorphology and contains a number of nationally and internationally important designated sites. Northam Burrows SSSI is a dune system protected by a pebble ridge located within the southern extent of the estuary. Braunton Burrows is a SSSI, SAC and UNESCO International Biosphere Reserve forming the northern extent of the estuary and is the largest dune system in the UK. Set back from the dunes are the Braunton Swanpool and the Greenaways and Freshway Marshes, both designated SSSIs. Braunton Burrows UNESCO Biosphere Reserve's core is based upon Braunton Burrows SAC, beyond this core the buffer zone stretches between Westward Ho! and Croyde, encompassing the Taw-Torridge Estuary up to Barnstaple and Bideford.</p> <p>Key to this area is the future of Northam Burrows. The Plan here is to allow the Pebble Ridge to roll back and naturally become more aligned with the dominant wave direction. This realignment of the coast will be managed by extending defences at Westward Ho! and continuing to protect the former landfill site. The Skern frontage will be held in place to ensure Northam Burrows continues to protect the inner estuary, while retaining as much land as possible, as land to seaward is lost. Implementation of this policy will need to consider allowing tidal incursion into the eastern side of Northam Burrows to help the wider Burrows adapt to sea level rise.</p> <p>The dune system of Braunton Burrows will be allowed to continue evolving naturally. The dunes are expected to continue to provide a robust natural defence for low-lying</p>			

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<p>areas of the Taw Estuary behind the Burrows over the next century. While retaining current defences at Saunton would not have any wider implications for coastal processes, future provision of defence here is unlikely to attract public funds from the flood and coastal defence budget and so will depend on the availability of other funds.</p> <p>The Taw/Torridge Estuary's far reaching views are underpinned by its national status as the North Devon AONB, North Devon Heritage Coast and Coastal Preservation Area. There are also fourteen Conservation Areas located along the banks of the Taw/Torridge Estuary and five Scheduled Monuments within this section of coast. The South West Coast Path running along the North Devon coast becomes the Tarka Trail between Saunton and Northam. The Tarka Trail follows the Taw and Torridge Rivers, providing a path from the coast into the mainland via a river. A railway runs from Barnstaple to Exeter along the southern bank of the River Taw within the SMP study area.</p> <p>The long-term Plan for the Taw/Torridge Estuary is to manage the flood risk to people, property and infrastructure, while allowing the estuary, where possible, to evolve naturally in response to climate change and rising sea levels. The Torridge Estuary is very steep-sided and unlikely to alter significantly, whether defended or undefended. Therefore any changes in policy can generally be managed locally without significant wider impact.</p> <p>The Taw Estuary has several potential areas for Managed Realignment that will provide both floodwater storage to benefit other parts of the estuary and the potential to create habitat. However, there is much uncertainty about both the individual and cumulative impacts of realignment schemes, particularly upon the sediment transport and current regime in the estuary and adjacent open coast. Implementation of Managed Realignment at any site in the outer Taw Estuary could alter flow regimes and thus coastal features at the mouth of the estuary. This could in turn increase flood risk from the sea in the estuary itself. Therefore, the short term policy is to maintain existing defences while more detailed investigations are undertaken to support moving towards the long term vision.</p>			
7c06 – Westward Ho!	<p><b>Policy = Hold the Line</b></p> <p>Westward Ho! is protected along the majority of this stretch by a seawall with additional rock armour toe protection at the northern end of the wall. Maintenance and eventual replacement of these structures will be required towards the end of this epoch, with replacement structures being much larger than the present ones such that they are better able to provide adequate levels of protection in the long term.</p> <p>The western end of this stretch, however, is comprised of undefended cliffs, the erosion of which could pose an outflanking risk in the future.</p>	<p><b>Policy = Hold the Line</b></p> <p>Having been upgraded towards the end of the first epoch, the seawall at Westward Ho! and associated rock armour are predicted to require ongoing repair and maintenance during this epoch.</p> <p>Erosion of the undefended cliffs could cause outflanking in this epoch, and so measures to bolster the western end of defences at Westward Ho! may be required.</p>	<p><b>Policy = Hold the Line</b></p> <p>The seawall at Westward Ho! and associated rock armour are predicted to require ongoing repair and maintenance during this epoch.</p> <p>Erosion of the undefended cliffs could cause outflanking in this epoch, and so measures to bolster the western end of defences at Westward Ho! may be required.</p>
	<p>The western end of this frontage is characterised by low cliffs, which are replaced by extensive low-</p>	<p>At the western end of this frontage, erosion of the undefended low cliffs would continue, which</p>	<p>Erosion of the low undefended cliffs at the western end of this frontage would continue, with</p>



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	<p>lying land, which is at risk of flooding, as the coast progresses eastwards towards the spit and dune system of Northam Burrows (that lies to the north-east of this stretch), which has formed at the mouth of the Taw/Torridge estuary. This spit and dune complex extends from Westward Ho! into the mouth of the Taw/Torridge Estuary, and towards Westward Ho! is fronted by a cobble/pebble ridge known as the 'Pebble Ridge'. Seaward of the ridge (and fronting much of the Westward Ho! frontage) is a wide intertidal beach consisting of a thin veneer of sand overlying clays, which merges, to the north, into the tidal delta of the Taw/Torridge Estuary (Pethick, 2007).</p> <p>The low cliffs along the western part of this frontage are cut into raised beach deposits, which consist of sand and rounded pebbles. These are currently eroding and therefore release pebbles back into the beach system. These low cliffs, which are largely undefended, are expected to continue to erode at a similar rate to present, which is estimated to be in the band of 0.1 and 0.5m/year.</p> <p>Further east along the low-lying parts of Westward Ho! there is a seawall and revetment which will continue to prevent cliff erosion, although a trend of beach narrowing along this stretch is expected to continue. These defences prevent sediment inputs to the system; however it is thought unlikely that inputs from this short</p>	<p>would release some sand and cobble sized sediments into the system. Pethick (2007) suggested that only sediments eroding from east of the Nose (i.e. this section of low, undefended cliffs) would be available to feed the Pebble Ridge to the east, due to the topography providing barriers to drift. However, such inputs are not significant enough to affect the net recession trend of the Pebble Ridge. This retreat of the Pebble Ridge could pose an outflanking risk to the eastern parts of Westward Ho! although this risk would be managed under this scenario as part of the 'Managed Realignment' policy for the adjacent Northam Burrows section, which would see extension of defences as necessary, along the low-lying parts of Westward Ho! that are currently considered to be 'in land' at the southern end of Northam Burrows.</p> <p>Maintenance of the defences along this Westward Ho! frontage would continue to protect against localised flooding and erosion; although beach narrowing would be expected and this, together with outflanking, along the adjacent undefended cliffs to the west, could make continued defences technically more difficult.</p>	<p>rates potentially increasing due to sea level rise. Maintenance of the defences at Westward Ho! would continue protecting against localised flooding and erosion; however, along these sections there will be increased issues of outflanking and undermining resulting from beach narrowing as the shoreline is unable to retreat naturally.</p> <p>Retreat, realignment and subsequent break-down of the Pebble Ridge to the north-east of this stretch will continue. This stretch of low-lying coast will therefore be at high risk from flooding due to breaching and increased overtopping along the adjacent stretch. It is unlikely that breaches, particularly at the southern end of the ridge (nearest this section at Westward Ho!), will seal naturally, and there may not be sufficient sediment available to allow human repair.</p> <p>However, the risk of flooding to the eastern parts of Westward Ho! that are currently considered to be 'in land' at the southern end of Northam Burrows, would continue to be managed as part of the 'Managed Realignment' policy for the adjacent Northam Burrows stretch.</p>

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	<p>section of cliffs would be sufficient to change the overall evolution of the Pebble Ridge.</p> <p>The future defence of Westward Ho! will be affected by the future management of the Pebble Ridge, which in turn will be affected by the future management and evolution of the Taw/Torridge estuary and its associated tidal delta, which play an important role in the sediment circulation within the wider Bideford Bay.</p> <p>The Pebble Ridge at its southern end (the north-eastern boundary of this unit) is predicted to retreat landwards as sea levels rise. Under the policy of 'Managed Realignment' for the adjacent Northam Burrows section, a new hard defence structure would be constructed along the southern area of Northam Burrows (fronting the developed area of Westward Ho! that is presently considered to be 'in land') in order to reduce the risk of flooding and outflanking to this defended section of Westward Ho!</p>		
<b>7c07 – Northam Burrows</b>	<p><b>Policy = Managed Realignment</b></p> <p>This section of coast extends along the seaward face of Northam Burrows, which is an area of low-lying land that forms a spit and dune system that encloses the southern part of the mouth of the Taw/Torridge Estuary.</p> <p>Much of this frontage is undefended by hard defence structures at this time, though protection is afforded to some degree by the cobble/pebble</p>	<p><b>Policy = Managed Realignment</b></p> <p>The policy of 'Managed Realignment' would continue to seek to work with the natural tendency of the Pebble Ridge to rotate anti-clockwise to become more swash aligned as it rolls back onto the low-lying land. To this end, it is envisaged that the low-reflective (revetment or armoured embankment) defence constructed perpendicular to the ridge at the southern end of</p>	<p><b>Policy = Managed Realignment</b></p> <p>The policy of 'Managed Realignment' would continue to seek to work with the natural tendency of the Pebble Ridge to rotate anti-clockwise to become more swash aligned as it rolls back onto the low-lying land. To this end, it is envisaged that the low-reflective (revetment or armoured embankment) defence constructed perpendicular to the ridge at the southern end of</p>

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	<p>ridge that runs along this length, known as the 'Pebble Ridge'.</p> <p>Along the northern seaward side of Northam Burrows, there is rock armour protection to the northern end of the spit where it re-curves into the estuary mouth. This would be maintained in support of the wider aims of the 'Managed Realignment' policy.</p> <p>The policy of 'Managed Realignment' would seek to work with the natural tendency of the Pebble Ridge to rotate anti-clockwise to become more swash aligned as it rolls back onto the low-lying land. To this end, it is envisaged that a low-reflective (revetment or armoured embankment) defence would be constructed perpendicular to the ridge at the southern end of this stretch, fronting the developed area of Northam Burrows in order to reduce flood risk in this area as the ridge rolls back landwards.</p> <p>Along the northern end of this stretch, where the ridge would want to advance seawards, measures to encourage this progradation could be implemented, likely to involve construction of groynes to aid sediment retention in this area, and possibly aided by beach recycling activities if required. There may also need to be secondary defences (embankments) constructed around the former landfill site at the northern end of Northam Burrows in order to ensure flood risk</p>	<p>this stretch in the short term, fronting the developed area of Northam Burrows in order to reduce flood risk in this area as the ridge rolls back landwards, may need to be extended eastwards during this epoch; though the need for this would be based upon ongoing monitoring.</p> <p>Along the northern end of this stretch, where the ridge would want to advance seawards, measures implemented in the short term to encourage this progradation would continue. However, this progradation may be limited by rising sea levels, and if not constructed in the short term, then secondary defences (embankments) would need to be constructed around the former landfill site at the northern end of Northam Burrows in order to ensure flood risk to this site is adequate.</p> <p>The rock armour protection along the northern end of the spit would also require ongoing maintenance, and eventual replacement, during this epoch, in support of the wider aims of the 'Managed Realignment' policy.</p>	<p>this stretch in the short term, fronting the developed area of Northam Burrows in order to reduce flood risk in this area as the ridge rolls back landwards, may need to be extended eastwards during this epoch; though the need for this would be based upon ongoing monitoring.</p> <p>Along the northern end of this stretch, where the ridge would want to advance seawards, measures implemented in the short term to encourage this progradation would continue. However, this progradation may be limited by rising sea levels, and so the secondary defences (embankments) constructed around the former landfill site at the northern end of Northam Burrows, would require ongoing maintenance during this epoch in order to ensure flood risk to this site is adequate.</p> <p>The rock armour protection along the northern end of the spit would also require ongoing maintenance during this epoch, in support of the wider aims of the 'Managed Realignment' policy.</p>

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	to this site is adequate.		
	<p>This frontage is characterised by the extensive spit and dune system of Northam Burrows, which has formed at the mouth of the Taw/Torridge estuary. This spit and dune complex is set back about a kilometre from the cliffed coastline to the west. It is fronted by a pebble and cobble beach ridge, known as the Pebble Ridge, which extends from Westward Ho! at its southern end into the mouth of the Taw/Torridge Estuary. Seaward of the ridge is a wide intertidal sand beach, which merges, to the north, into the tidal delta of the Taw/Torridge Estuary.</p> <p>The Pebble Ridge currently receives only limited inputs of new sediment and historically it has been eroding; this erosion is predicted to continue during this epoch, associated with a gradual movement towards swash-alignment from the previous drift-aligned shoreline. The ridge crest is narrowing and lowering and, as such, the risk of overtopping and possibly even breaching is predicted to increase during this epoch. Any breaches during this period would be expected to be re-sealed by littoral processes as there is sufficient material being moved alongshore to achieve this. The flood risk to low-lying parts of Westward Ho! would increase as a result of these processes, and so to minimise this risk, defences would be constructed at the southern end of Northam Burrows, perpendicular to the ridge</p>	<p>Historically the pebble ridge that fronts this section has been realigning towards a swash-aligned position. This has meant that the southern end of the feature has retreated more rapidly than the northern end. This landward roll back of the ridge has been accompanied by a net reduction in volume. This process is expected to continue in the future as it is not thought that the feature has yet attained a swash-aligned position.</p> <p>It has been postulated that the rate of retreat could increase exponentially in the future, with between 100 and 150m retreat possible by year 50. In order to continue to protect the eastern part of Westward Ho! (the southern end of Northam Burrows), continued maintenance and possible extension of the defence constructed in the short term perpendicular to the ridge will occur.</p> <p>As material is moved from south to north and is not being replaced in sufficient quantities from further south, the risk of the Pebble Ridge becoming breached will increase during this period and it is likely that over time these breaches will not become sealed naturally. This will expose the low-lying area behind and the dunes at Northam Burrows to erosion and flooding. The location of any breach may be significant, for example a breach into Sandymere Lagoon may result in the development of a tidal</p>	<p>Retreat, realignment and subsequent break-down of the Pebble Ridge will continue, with greatest rates of erosion at the northern end. The ridge could have retreated over 300m in total by the end of this period, although low-lying eastern parts of Westward Ho! would continue to be protected by the maintenance of the defence constructed in the short term perpendicular to the ridge.</p> <p>This stretch of low-lying coast will therefore be at high risk from flooding due to breaching and increased overtopping. It is unlikely that breaches, particularly at the southern end, will seal naturally therefore a number of tidal inlets may be present, which may accelerate the rate of barrier breakdown. These inlets may, however, allow sediment incursion into these back-barrier areas allowing accumulation of finer sediments in the long-term; however, this is likely to be a slow process (Orford, 2004; Pethick, 2007).</p> <p>There is, however, a small possibility that a pulse of sediment could be supplied to this shoreline, should a large landslip event occur to the west. However, it has been questioned whether sediment would actually reach this frontage, even if such an event occurred, due to the landward retreat of the ridge (Orford, 2004).</p> <p>It is thought unlikely the Taw/Torridge estuary</p>

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	<p>crest.</p> <p>Sediment eroded from the cliffs to the south-west will be moved along this frontage, but finer sediments are likely to continue northwards into the mouth of the estuary and from there either be moved into the outer estuary or into the sediment circulation system and eventually back onto these beaches. The transport of coarser sediments is more limited and there is a very limited supply of new sediments; therefore the trend of net volume loss along the Pebble Ridge is expected to continue.</p>	<p>inlet. Sea level rise will also increase the likelihood of hinterland flooding and breaching of the ridge.</p> <p>It is thought unlikely the Taw/Torridge estuary would cut an alternative route through the low-lying area behind the barrier. There may be increased pressure at the mouth of the estuary, but changes here are expected to be small due to the influence of the cobble ridge at Grey Sand Hill.</p>	<p>would cut an alternative route through the low-lying area behind the barrier. There may be increased pressure at the mouth of the estuary, but changes here are expected to be small due to the influence of the cobble ridge at Grey Sand Hill.</p>
<b>7c08 – Skern Salt Marsh to Appledore (west)</b>	<p><b>Policy = Hold the Line</b></p> <p>This section encompasses the inner part of the Northam Burrows spit and dune complex where it enters the Taw/Torridge Estuary. It is defended by a combination of embankment and rock revetment defences, and fronted a narrow shingle ridge and an expanse of salt marsh and intertidal mudflats.</p> <p>These defences would be monitored and maintained to ensure they continue to provide protection against the risk of flooding from this area, particularly to the former landfill site located at the northern end of Northam Burrows. This would support the measures in the adjacent Northam Burrows section which envisages measures being undertaken to reduce the risk of flooding and erosion of the landfill site for the</p>	<p><b>Policy = Hold the Line</b></p> <p>The existing defences would be maintained and eventually re-built as they reach the end of their effective life.</p> <p>Retention of defences along this stretch would continue to provide adequate levels of protection against flood risk to the low-lying hinterland of Northam Burrows from this area.</p> <p>Implementation of this policy will, however, also need to consider allowing tidal incursion into the eastern side of Northam Burrows to help the wider Burrows adapt to sea level rise; although in considering this potential impacts upon the landfill site will also need to be addressed.</p>	<p><b>Policy = Hold the Line</b></p> <p>The rebuilt defences would be maintained during this epoch.</p>

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	<p>same purpose. These measures require further detailed investigation but could involve rock revetment, embankment or sheet piling.</p> <p>Along the southern shore of Skern Saltmarsh, defences could also need to be rebuilt during this period to address localised erosion issues.</p>		
	<p>The channel in the outer estuary is characterised by a number of rock outcrops which ultimately constrain channel movement. The mouth of the estuary is also constrained by the high rates of longshore transport, which have resulted in the formation of the two spits on either side of the mouth (in the case of this stretch, Northam Burrows). Despite the trend for swash aligned along the open coast shoreline, during this period, little change is anticipated in the rate of longshore drift; therefore this will remain a constraint on the mouth and so this area at Skern.</p> <p>The defences along this stretch (and within the wider outer Taw/Torridge Estuary) will remain the same as today; therefore the current trend of very slow accretion within the estuary is likely to continue.</p>	<p>During this period the impact of accelerated sea level rise and changes in the alignment of the Pebble Ridge, along the adjacent open coast stretch, may start to have an impact on the estuary and in particular the outer estuary, including this area at Skern.</p> <p>Retention of defences in this epoch along this stretch would continue to reduce the risk of flooding from this area to the wider low-lying expanse of Northam Burrows. However, this would reduce the ability of the intertidal mudflats and salt marsh to adapt to increased pressures (i.e. erosion and coastal squeeze); although this may be mitigated to some extent by allowing tidal incursion through the defence line into the eastern side of Northam Burrows.</p> <p>A net trend of continued, slow infilling is expected under a scenario of sea level rise and the estuary will also attempt to widen at its mouth (Pethick, 2007). The channel bed is over-deepened by more than 15m below its present level, and therefore sea level rise is not predicted to cause an increase in channel size, rather a</p>	<p>There is a high level of uncertainty with regard to how the estuary will evolve as sea level rise. In general the trend of slow infilling is expected to continue, with sediments from alongshore and the nearshore being moved into the estuary. The mouth of the estuary will also attempt to widen in response to an increased tidal prism. This will likely put increasing pressure (i.e. erosion and coastal squeeze) on the intertidal mudflats and salt marsh at Skern; this could be mitigated to some extent by allowing tidal incursion through the defence line into the eastern side of Northam Burrows.</p> <p>The evolution of the Taw and Torridge estuaries will remain constrained by defences. The estuary will therefore remain a net sink for sediment and as demand for sediment increases, this could result in increased erosion of the open coast shorelines as more sediment is moved into the estuaries. This could impact upon this section. It is, however, very difficult to quantify such impacts, without further study.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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		<p>reduction of infilling rates (Pethick, 2007). There are geological constraints, but also the strong longshore movement of sand has also been a constraint on the mouth width.</p> <p>The rate of sediment transport into the estuary from the Northam Burrows frontage may be affected by any breaches occurring during this period, although sand may still be transported in the nearshore zone. The defences along this section; along with the cobble ridge along the northern part of Northam Burrows; will provide some protection.</p> <p>It is not likely that the channel would be able to cut a new path through the Northam Burrows back barrier area, as it occupies an incised channel and has remained in its current configuration for the duration of the Holocene period (Pethick, 2007). Continued defence along this stretch would also prevent this occurring.</p>	
<b>7c09 – Appledore</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>There are a range of flood walls and embankments protecting the settlement of Appledore.</p> <p>Many of these defences are likely to require upgrading (i.e. replacing with new, larger defences) towards the end of this epoch such that they are able to provide adequate levels of protection in the long term as sea levels rise.</p>	<p>Defences re-built in the short term would require ongoing maintenance during this epoch, whilst any defences not replaced in the short term will need to be upgraded during this epoch (i.e. also replaced with larger structures), such that they are able to provide adequate levels of protection in the long term as sea levels rise.</p>	<p>There would be ongoing maintenance of the various defences along the Appledore frontage during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>During this period, the defences would be maintained and are generally expected to remain in their current condition (or better as and when they are upgraded in the latter part of this epoch) and therefore little change is expected within this part of the Torridge Estuary, with current trends expected to continue. This may place increased stress on the defences at Appledore due to the current position of the meanders, and so any replacement structures would need to consider how to mitigate these impacts.</p>	<p>The defences will continue to fix the shoreline position and minimise the risk of hinterland flooding at Appledore.</p> <p>Under a scenario of sea level rise, the net trend of infilling is likely to continue within the estuary, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area fronting the defences at Appledore. North of Torridge Bridge (which includes this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks on both sides of the estuary (Pethick, 2007) including in particular those at Appledore. Channel widening and meander development will therefore increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Defences will also continue to fix the shoreline position in places, including along this stretch at Appledore, and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes this stretch) increases in meander amplitude as a result of sea level rise are predicted to impact channel banks on both sides of the estuary, including those at Appledore. Channel widening and meander development will increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
7c10 – Appledore to Cleave Moorings, Northam	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This part of the western bank of the estuary is defended in parts by localised embankment type defences, which are backed by steeply rising	Existing embankments will deteriorate and fail during this epoch. No properties will be at risk of	No defences.



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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>ground that constrains the estuary along this length. It is fronted by a varying expanse of intertidal mudflats.</p> <p>There are no assets at risk of flooding in this area. Therefore there is no economic justification to maintain defences here.</p>	<p>flooding as a result.</p>	
	<p>During this period, the defences are generally expected to remain in their current condition even without maintenance and therefore little change is expected within this part of the Torridge Estuary, with current trends expected to continue. This may place increased stress on the defences along this stretch however, due to the current position of the meanders.</p>	<p>Where they occur, the defences will deteriorate and fail during this epoch, allowing this part of the estuary to adapt naturally in the future; although this will remain constrained by the steeply rising topography along this stretch.</p> <p>Under a scenario of sea level rise, the net trend of infilling of the estuary is likely to continue, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area. North of Torridge Bridge (which includes this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks along the estuary (Pethick, 2007). Channel widening and meander development will therefore increase pressure on the defences along this stretch during this epoch (Pethick, 2007), meaning they may fail more quickly than would otherwise be expected. The naturally rising ground along the rest of this stretch will, however, constrain the evolution of</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Even without defences along this stretch, the shoreline position will continue to be constrained by the steeply rising ground.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes this stretch) increases in meander amplitude as a result of sea level rise, are predicted to impact channel banks along the estuary (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>

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		the estuary in this area.	
7c11 – Cleave Moorings, Northam and Bideford	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	There are a range of flood walls and embankments protecting the settlements of Northam and Bideford against the risk of flooding. Many of these defences were upgraded in the recent past and these would be maintained during this epoch.	Existing defences will require ongoing maintenance and repair during this period. It may also be necessary to raise the height of the defences during this epoch as sea level rises.	Existing defences will require ongoing maintenance and repair during this period. It may also be necessary to either raise the height of the defences further during this epoch as sea level rise accelerates, or even re-build the defences in the latter part of the this epoch as the recent scheme reaches the end of its design life.
	During this period, the defences along this stretch are generally expected to remain in their current condition and therefore little change is expected along this part of the Torridge Estuary, with current trends expected to continue. This may place increased stress on the defences at Bideford and Northam due to the current position of the meanders.	<p>The defences will continue to fix the shoreline position along this stretch and minimise the risk of hinterland flooding.</p> <p>Under a scenario of sea level rise, the net trend of infilling of the estuary is likely to continue, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area. North of Torridge Bridge (which includes the northern part of this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks along the estuary (Pethick, 2007). Channel widening and meander development will therefore increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Defences along this stretch will also continue to fix the shoreline position and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes the northern part of this stretch) increases in meander amplitude as a result of sea level rise are predicted to impact channel banks on both sides of the estuary, e.g. along the settlements of Appledore and Instow. Channel widening and meander development will increase pressure on the defences during this epoch, resulting in</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
			<p>increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
<b>7c12 – Upper Torridge Estuary (right (east) and left (west) banks between Bideford and Weare Gifford)</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>
	<p>Parts of this stretch (particularly low-lying areas) are protected mainly by embankment defences, although there are some short lengths of flood wall defences at places like Hallspill.</p> <p>These defences are likely to require maintenance during this period, although the main activity will be monitoring erosion of the banks to inform when (or if) intervention is required.</p> <p>Other parts of this upper Torridge Estuary are undefended, being flanked by steeply rising ground that naturally constrains the estuary. These undefended areas would continue to evolve naturally.</p> <p>There is currently not enough information to decide exactly which area of the upper Torridge will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>	<p>There would be ongoing monitoring of the embankments along this stretch to determine if and when maintenance, or even re-building (possibly in a realigned position), of the defences along parts of this stretch is required; this will be driven by extent and rate of bank erosion.</p> <p>Undefended areas will continue to evolve naturally.</p> <p>There is currently not enough information to decide exactly which area of the upper Torridge will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>	<p>There would be ongoing monitoring of the embankments along this stretch to determine if and when maintenance, or even re-building (possibly in a realigned position), of the defences along parts of this stretch is required; this will be driven by extent and rate of bank erosion.</p> <p>Undefended areas will continue to evolve naturally.</p> <p>There is currently not enough information to decide exactly which area of the upper Torridge will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>
	<p>During this period, the defences are generally</p>	<p>The defences, either retained in existing or</p>	<p>Future change is difficult to predict due to the</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>expected to remain in their current condition and therefore little change is expected within the upper Torridge Estuary, with current trends expected to continue.</p> <p>In areas where there are no defences, the estuary will continue to evolve naturally, but would ultimately be constrained by the steeply rising topography that forms the Torridge valley.</p>	<p>realigned positions, will continue to fix the shoreline position in places and minimise the risk of hinterland flooding.</p> <p>In areas where there are no defences, the estuary will continue to evolve naturally, but would ultimately be constrained by the steeply rising topography that forms the Torridge valley.</p> <p>Under a scenario of sea level rise, the net trend of infilling of the estuary is likely to continue, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p>	<p>uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Defences will also continue to fix the shoreline position in places and minimise the risk of hinterland flooding.</p> <p>In areas where there are no defences, the estuary will continue to evolve naturally, but would ultimately be constrained by the steeply rising topography that forms the Torridge valley.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p>
7c13 – East-the-Water to Torridge Bridge (A39)	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>There are a range of flood walls and embankments protecting the settlement of East-the-Water and the A386 road that runs along the northern part of this stretch on the east side of the Torridge Estuary. It is fronted by a varying expanse of intertidal mudflats and salt marsh.</p> <p>These defences are likely to require maintenance during this epoch.</p>	<p>Existing defences will require ongoing maintenance and repair during this period. It may also be necessary to raise the height or even re-build some of the defences during this epoch as sea level rises.</p>	<p>Existing defences will require ongoing maintenance and repair during this period. It may also be necessary to raise the height or even re-build some of the defences during this epoch as sea level rises.</p>
	<p>During this period, the defences are generally expected to remain in their current condition and therefore little change is expected along this part of the Torridge Estuary, with current trends</p>	<p>The defences will continue to fix the shoreline position along this stretch and minimise the risk of hinterland flooding.</p> <p>Under a scenario of sea level rise, the net trend</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>expected to continue. This may place increased stress on the defences along this stretch due to the current position of the meanders.</p>	<p>of infilling of the estuary is likely to continue, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area. Channel widening and meander development will therefore increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p>	<p>opportunity for salt marsh development, even if sufficient sediments were available. Defences along this stretch will also continue to fix the shoreline position in places and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>Channel widening and meander development will increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
7c14 – Torridge Bridge (A39) to Instow	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>This stretch is defended by a range of embankment and flood wall defences located at the back of a varying expanse of intertidal mudflats and salt marsh.</p> <p>These defences will require ongoing maintenance during this epoch.</p>	<p>Existing defences will require maintenance and eventual upgrading during this period, with existing defences being replaced with much larger defences such that they are able to provide protection against flooding and erosion to the B3233 road that runs along the length of this stretch.</p>	<p>Having been upgraded in the medium term, defences along this stretch will require ongoing maintenance during this epoch.</p>
	<p>During this period, the defences are generally expected to remain in their current condition and therefore little change is expected along this part</p>	<p>The defences along this shoreline will continue to fix the shoreline position in places and minimise the risk of hinterland flooding.</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>of the Torridge Estuary, with current trends expected to continue. This may place increased stress on the defences along this stretch due to the current position of the meanders.</p>	<p>Under a scenario of sea level rise, the net trend of infilling of the estuary is likely to continue, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area. North of Torridge Bridge (which includes this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks along this part of the estuary (Pethick, 2007). Channel widening and meander development will therefore increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p>	<p>extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Defences along this stretch will also continue to fix the shoreline position in places and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes this stretch), increases in meander amplitude as a result of sea level rise are predicted to impact channel banks along this part of the estuary. Channel widening and meander development will increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
<b>7c15 – Instow</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>A range of flood walls and embankments protect the settlement of Instow along this stretch.</p> <p>Many of these defences are likely to need to be replaced with larger defences towards the end of this epoch such that they are able to provide</p>	<p>Defences re-built in the short term would require ongoing maintenance during this epoch, whilst any defences not replaced in the short term will need to be upgraded during this epoch (i.e. also replaced with larger structures), such that they are able to provide adequate levels of protection</p>	<p>There would be ongoing maintenance of the various defences along the Instow frontage during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	adequate levels of protection in the long term as sea levels rise.	in the long term as sea levels rise.	
	<p>During this period, the defences would be maintained and are generally expected to remain in their current condition (or better as and when they are upgraded in the latter part of this epoch) and therefore little change is expected within this part of the Torridge Estuary, with current trends expected to continue. This may place increased stress on the defences at Instow due to the current position of the meanders, and so any replacement structures would need to consider how to mitigate these impacts.</p>	<p>The defences will continue to fix the shoreline position and minimise the risk of hinterland flooding at Instow.</p> <p>Under a scenario of sea level rise, the net trend of infilling is likely to continue within the estuary, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area fronting the defences at Instow.</p> <p>North of Torridge Bridge (which includes this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks on both sides of the estuary (Pethick, 2007) including in particular those at Instow. Channel widening and meander development will therefore increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. Defences will also continue to fix the shoreline position in places, including along this stretch at Instow, and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes this stretch) increases in meander amplitude as a result of sea level rise are predicted to impact channel banks on both sides of the estuary, including those at Instow. Channel widening and meander development will increase pressure on the defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
7c16 – Instow	Policy = Managed Realignment	Policy = Managed Realignment	Policy = Managed Realignment

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<b>Dunes</b>	<p>A small area of dunes currently provides a natural flood defence to the developed area of Instow along this frontage.</p> <p>To ensure this defence function is provided into the future, pro-active dune management is required. This policy could be supported by development of a dune/beach management plan. This policy might also involve extending the dunes southwards along Instow Beach and altering highway drainage.</p>	<p>Continuation of pro-active dune management to ensure the flood defence function of the dunes continues to be provided. If this defence function begins to reduce as sea levels rise, then consideration to a set-back defence may be needed to reduce the flood risk to Instow from this frontage.</p>	<p>Continuation of pro-active dune management to ensure the flood defence function of the dunes continues to be provided. If this defence function begins to reduce as sea levels rise, then consideration to a set-back defence may be needed to reduce the flood risk to Instow from this frontage.</p>
	<p>Pro-active dune management will allow the dunes to adapt largely naturally to any changes in estuary processes in this period, whilst ensuring flood risk to Instow continues to be reduced.</p>	<p>Continued pro-active dune management will allow the dunes to adapt largely naturally to any changes in estuary processes in this period, whilst ensuring flood risk to Instow continues to be reduced.</p> <p>Under a scenario of sea level rise, the net trend of infilling is likely to continue within the estuary, albeit at a slow rate due to the lack of availability of muddy sediments in the coastal system.</p> <p>Configurations of the low water channel will influence future localised patterns of erosion, sediment transport and deposition within the intertidal area fronting the dunes at Instow.</p> <p>North of Torridge Bridge (which includes this stretch), increases in meander amplitude, as a result of sea level rise, are predicted to impact channel banks on both sides of the estuary (Pethick, 2007) including in particular those at Instow. Channel widening and meander</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The Torridge is extremely confined by its geology, with limited opportunity for salt marsh development, even if sufficient sediments were available. If able to be allowed to continue to adapt naturally, the dunes will provide flood defence to Instow. However, if this becomes compromised in this period a set-back defence will be needed. This will eventually fix the shoreline position along this stretch at Instow, and minimise the risk of hinterland flooding.</p> <p>As sea level rise accelerates, the estuary is expected to continue to slowly infill, although this accretion may reduce (Pethick, 2007).</p> <p>North of Torridge Bridge (which includes this stretch) increases in meander amplitude as a result of sea level rise are predicted to impact</p>



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		<p>development will therefore increase pressure on the dunes during this epoch, resulting in increased need for dune management (Pethick, 2007).</p> <p>If this pressure causes significant dunes erosion, construction of a set-back defence to continue to reduce flood risk to Instow, situated landwards of the dunes, is likely to be required.</p>	<p>channel banks on both sides of the estuary, including those at Instow. Channel widening and meander development will increase pressure on the dunes/defences during this epoch, resulting in increased need for maintenance (Pethick, 2007).</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the estuary, increasing the potential for sediment reworking both by waves and currents.</p>
7c17 – Instow to Yelland	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>A range of gabion, revetment and embankment defences protect low-lying areas of largely reclaimed farmland along this stretch, although defences also protect a small area of development along part of this frontage against the risk of flooding.</p> <p>These defences will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment'.</p> <p>The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, both in terms of individual impacts of realigning in this area alone, and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p>	<p>If found to be appropriate by detailed studies in the short term, then defences would be realigned along all or parts of this section during this epoch. Where defences are not realigned, they would be maintained and eventually replaced with much larger structures during this epoch.</p> <p>However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and eventually replaced with much larger structures during this epoch.</p>	<p>Defences along this stretch, either in realigned or existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.</p>

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	Pethick (2007) highlights potential risks associated with cumulative effects of 'Managed Realignment' in the outer estuary, and much uncertainty exists at present.		
	During this period little change is expected within this part of the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, although this is not thought to be a significant risk along this stretch. Continued provision of defences will continue to minimise the risk of flooding.	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch, either in realigned or existing positions, will continue to minimise the risk of flooding of lower-lying areas.</p> <p>With sea level rise there would increased pressure on defences as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences towards Home Marsh Farm (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences along this stretch, either in their existing or realigned positions, will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences (particularly if not realigned) as the estuary responds to an increased tidal prism resulting from sea level rise.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences towards Home Marsh Farm (Pethick, 2007).</p>
7c18 – Home Farm Marsh (Yelland to Fremington)	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>There is a combination of flood wall and embankment defences that protect low-lying areas along this stretch, as well as part of the Tarka Trail, against the risk of flooding, although not all of this length is protected by defences.</p> <p>These defences are likely to require, in places, re-</p>	<p>If found to be appropriate by detailed studies in the short term, then defences would be realigned along this section during this epoch.</p> <p>However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and</p>	<p>Defences along this stretch, either in realigned or existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>building towards the end of this epoch/early in the next epoch, in order that an adequate level of protection is provided in the long term under this scenario to 'hold the line' over the next 100 years.</p> <p>Therefore, these defences will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along this frontage.</p> <p>The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, both in terms of individual impacts of realigning in this area alone, and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system. Pethick (2007) highlights potential risks associated with cumulative effects of 'Managed Realignment' in the outer estuary, and much uncertainty exists at present.</p> <p>In this area there is also potentially contaminated landfill from the former power station that would need to be accounted for when considering potential realigned defence positions.</p>	<p>eventually replaced with much larger structures during this epoch.</p>	
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	meanders, such as towards the eastern end of this stretch, but defences will continue to minimise the risk of flooding.	<p>expected to continue. The defences along this stretch will continue to minimise the risk of flooding of lower-lying intertidal areas.</p> <p>The defences along this stretch, either in realigned or existing positions, will continue to minimise the risk of flooding of lower-lying areas.</p> <p>With sea level rise there would be increased pressure on defences (particularly if not realigned) as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those along this stretch at Home Marsh Farm (Pethick, 2007).</p>	<p>sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences along this stretch will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those along this stretch at Home Marsh Farm (Pethick, 2007).</p>
7c19 - Fremington	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>There is a combination of flood wall and embankment defences that protect low-lying developed areas along this stretch, as well as part of the Tarka Trail, against the risk of flooding, although not all of this length is protected by defences.</p> <p>These defences are likely to require, in places, re-building towards the end of this epoch/early in the next epoch, in order that an adequate level of protection is provided in the long term under this scenario to 'hold the line' over the next 100</p>	<p>The defences along this stretch would need to be maintained and eventually replaced with much larger structures during this epoch (if not occurred in the short-term) in order to continue to reduce the risk of flooding to people and property at Fremington.</p>	<p>Defences along this stretch would require ongoing maintenance during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>years.</p> <p>Therefore, these defences will require maintenance and improvement during this epoch.</p>		
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, such as towards the eastern end of this stretch, but defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch will continue to minimise the risk of flooding of lower-lying intertidal areas.</p> <p>The defences along this stretch, either in realigned or existing positions, will continue to minimise the risk of flooding of lower-lying areas.</p> <p>With sea level rise there would be increased pressure on defences (particularly if not realigned) as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those along this stretch (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences along this stretch will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those along this stretch (Pethick, 2007).</p>
<b>7c20 – Fremington to Penhill Point</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>There are no defences along this short length of estuary frontage, which is comprised of high ground.</p>	<p>No defences.</p>	<p>No defences.</p>
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to</p>	<p>During this period the impact of accelerated sea</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	continue. The naturally high ground along this section will constrain the estuary..	level rise will become more important.  Overall net, slow infilling of the estuary is expected to continue. The high ground along this section will continue to constrain the estuary in this area.	level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.  The natural high round along this section will continue to constrain the estuary in this area.
7c21 – Penhill Point to Bickington	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	Defences along this stretch comprise embankments primarily protecting the Tarka Trail.  These defences will all require ongoing maintenance during this epoch, whilst options for implementing the medium-term policy are investigated. Managed Realignment in this area may involve full realignment of the Tarka Trail, perhaps simply to higher ground. Alternatively, opportunities to allow tidal incursion through the defence line to create habitat in this area whilst retaining the Tarka Trail may be more appropriate. This should be considered when assessing realignment options.	If appropriate, then realignment would occur in this period. This would be either through realignment of the Tarka Trail or retreat to higher ground. Alternatively, if full realignment is not feasible, the embankments will need to be maintained and improved along the existing alignment whilst allowing tidal incursion through the defence line to create habitat in this area. This will be guided by studies in the short-term.	There would be ongoing maintenance of all defences along this stretch during this epoch.
	During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, such as at Barnstaple, but defences will continue to minimise the risk of flooding.	During this period the impact of accelerated sea level rise will become more important.  Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch will continue to minimise the risk of flooding of lower-lying intertidal areas.  With sea level rise there would increased pressure on defences at Barnstaple and	Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.  The defences along this stretch will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>Sticklepath as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences at Bickington (Pethick, 2007).</p>	<p>these defences as the estuary responds to an increased tidal prism resulting from sea level rise. In particular defences at Barnstaple and Sticklepath are likely to be put under increased pressure.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences at Bickington (Pethick, 2007).</p>
7c22 – Bickington to A39	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>There are a range of flood walls and embankments protecting settlements along this stretch of the Taw Estuary, including Barnstaple, Bickington and Sticklepath.</p> <p>These defences will all require ongoing maintenance during this epoch, whilst some may even need to be replaced with new, larger structures towards the end of this epoch such that they are able to provide adequate levels of protection in the long term against the risk of flooding.</p>	<p>Defences re-built in the short term would require ongoing maintenance during this epoch, whilst any defences not replaced in the short term will need to be upgraded during this epoch (i.e. also replaced with larger structures), such that they are able to provide adequate levels of protection in the long term as sea levels rise.</p>	<p>There would be ongoing maintenance of all defences along this stretch during this epoch.</p>
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, such as at Barnstaple, but defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch will continue to minimise the risk of flooding of lower-lying intertidal areas.</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences along this stretch will continue to</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>With sea level rise there would increased pressure on defences at Barnstaple and Sticklepath as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences at Bickington (Pethick, 2007).</p>	<p>minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise. In particular defences at Barnstaple and Sticklepath are likely to be put under increased pressure.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences at Bickington (Pethick, 2007).</p>
<b>7c23 – Upper Taw Estuary (right (east) and left (west) banks between A39 to tidal limit near Bishops Tawton)</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>	<b>Policy = Hold the Line/Managed Realignment/No Active Intervention</b>
	<p>There are a range of embankment defences associated with the railway and reclaimed farmland upstream of Barnstaple, although some parts of the upper Taw Estuary are undefended.</p> <p>There is currently not enough information to decide exactly which area of the upper Taw will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>	<p>The existing embankments along this stretch will require maintenance and upgrading (replaced with larger structures – possibly in a realigned position) during this period.</p> <p>The undefended parts of the upper Taw Estuary will continue to evolve naturally.</p> <p>There is currently not enough information to decide exactly which area of the upper Taw will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>	<p>The various defences along this stretch, where they occur, will continue to be maintained during this epoch.</p> <p>The undefended parts of the upper Taw Estuary will continue to evolve naturally.</p> <p>There is currently not enough information to decide exactly which area of the upper Taw will be subject to which policy. This will be determined by the developing Taw-Torridge Estuary strategy study (being led by the Environment Agency).</p>
	During this period little change is expected within the Taw Estuary, with current trends expected to	During this period the impact of accelerated sea level rise will become more important.	Future change is difficult to predict due to the uncertainty of estuary development following sea



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>continue.</p> <p>Along this upper part of the Taw Estuary, upstream of Barnstaple, the edge of the floodplain is, in places, bordered by a railway embankment on the right bank and by rapidly rising ground on the left bank. Here little or no change is anticipated.</p>	<p>Overall net, slow infilling of the estuary is expected to continue. The defences, where they occur, will continue to minimise the risk of flooding of lower-lying intertidal areas.</p> <p>However, where low-lying areas are undefended, the estuary would be able to adapt to rising sea levels by transgressing onto these areas, which in turn would minimise the effects of coastal squeeze to localised areas of salt marsh.</p>	<p>level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p>
7c24 – A39 to West Ashford (Barnstaple)	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>There are a range of flood walls and embankments providing protection against the risk of flooding along this stretch, many of which protect the settlement of Barnstaple.</p> <p>These defences will all require ongoing maintenance during this epoch, whilst some may even need to be replaced with new, larger structures towards the end of this epoch such that they are able to provide adequate levels of protection in the long term against the risk of flooding.</p>	<p>Defences re-built in the short term would require ongoing maintenance during this epoch, whilst any defences not replaced in the short term will need to be upgraded during this epoch (i.e. also replaced with larger structures), such that they are able to provide adequate levels of protection in the long term as sea levels rise.</p>	<p>There would be ongoing maintenance of all defences along this stretch during this epoch.</p>
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, such as at Barnstaple, but defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences will continue to minimise the risk of flooding of lower-lying intertidal areas.</p> <p>With sea level rise there would be increased</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences will continue to minimise the risk of flooding of lower-lying areas, although increased</p>

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		<p>pressure on defences at Barnstaple as the estuary tries to widen in response to a greater tidal prism.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those at West Ashford (Pethick, 2007).</p>	<p>pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise. In particular defences at Barnstaple are likely to be put under increased pressure.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel. There is potential for increased stress of existing defences, including those at West Ashford (Pethick, 2007).</p>
7c25 – West Ashford to Braunton (east bank of River Caen)	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>There are a range of flood walls and embankments that provide protection against the risk of flooding to low-lying parts of this area of the Taw Estuary at Chivenor Airfield, although the eastern end of this stretch is backed by steeply rising ground. Some of these defences have recently been realigned by the Ministry of Defence at Chivenor.</p> <p>However, there remains potential for realignment in the western part of this section (along the east bank of the River Caen).</p> <p>Therefore, defences along this section will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along parts of this section.</p> <p>The studies required during this stage would need</p>	<p>If found to be appropriate by detailed studies in the short term, then defences would be realigned along parts of this section during this epoch. Where defences are not realigned (such as those only recently realigned at Chivenor), they would be maintained and eventually replaced with much larger structures during this epoch.</p> <p>However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and eventually replaced with much larger structures during this epoch.</p>	<p>Defences along this stretch, either in realigned or existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>to consider the impacts of implementing 'Managed Realignment' upon both the flood risk reduction in the wider estuary system, as well as the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, in terms of individual impacts of realigning in this area alone and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p> <p>Pethick (2007) highlights potential risks associated with cumulative effects of 'Managed Realignment' in the outer estuary, and much uncertainty exists at present.</p>		
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Key areas at risk will be at the apex of meanders, such as those located towards the eastern end of this stretch near West Ashford, but defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch, either in their existing or realigned positions, will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel (Pethick, 2007).</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p> <p>A key control on patterns of erosion and accretion will remain the configurations of the low water channel (Pethick, 2007).</p>
<b>7c26 – Braunton to Horsey Island (west bank of</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	There are a range of flood walls and	If found to be appropriate by detailed studies in	Defences along this stretch, either in realigned or

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River Caen)	<p>embankments that provide protection against the risk of flooding to this low-lying area of the Taw Estuary. Many of these defences will require replacement towards the end of this epoch as they reach the end of their effective life.</p> <p>Therefore, defences along this section will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along parts of this section.</p> <p>The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon both the flood risk reduction in the wider estuary system, as well as the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, in terms of individual impacts of realigning in this area alone and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p> <p>Pethick (2007) highlights potential risks associated with cumulative effects of 'Managed Realignment' in the outer estuary, and much uncertainty exists at present.</p>	<p>the short term, then defences would be realigned along parts of this section during this epoch. Where defences are not realigned, they would be maintained and eventually replaced with much larger structures during this epoch.</p> <p>However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and eventually replaced with much larger structures during this epoch.</p>	<p>existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.</p>
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Continued provision of defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch, either in their existing or realigned</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		positions, will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting form sea level rise.	The defences will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting form sea level rise.
<b>7c27 – Horsey Island</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>Earth embankments along this stretch of reclaimed land provide protection against the risk of flooding to this low-lying area of the Taw Estuary. These defences will require replacement towards the end of this epoch as they reach the end of their effective life.</p> <p>Therefore, defences along this section will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along parts of this section.</p> <p>The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon both the flood risk reduction in the wider estuary system, as well as the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, in terms of individual impacts of realigning in this area alone and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p> <p>Pethick (2007) highlights potential risks associated with cumulative effects of 'Managed Realignment'</p>	<p>If found to be appropriate by detailed studies in the short term, then defences would be realigned along parts of this section during this epoch. Where defences are not realigned, they would be maintained and eventually replaced with much larger structures during this epoch.</p> <p>However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and eventually replaced with much larger structures during this epoch.</p>	<p>Defences along this stretch, either in realigned or existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	in the outer estuary, and much uncertainty exists at present.		
	During this period little change is expected within the Taw Estuary, with current trends expected to continue. Continued provision of defences will continue to minimise the risk of flooding.	During this period the impact of accelerated sea level rise will become more important.  Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch, either in their existing or realigned positions, will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.	Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.  The defences will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.
<b>7c28 – Horsey Island to Crow Point</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	Earth embankments along much of this stretch provide protection against the risk of flooding to this low-lying area of the outer Taw Estuary. These defences will require replacement towards the end of this epoch as they reach the end of their effective life.  Therefore, defences along this section will require maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along parts of this section.  The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon both the flood risk reduction in the wider estuary system, as well as the wider	If found to be appropriate by detailed studies in the short term, then defences would be realigned along parts of this section during this epoch. Where defences are not realigned, they would be maintained and eventually replaced with much larger structures during this epoch.  However, if the studies show it is inappropriate to realign defences here, then all of the existing defences would need to be maintained and eventually replaced with much larger structures during this epoch.  Management of this area, particularly towards Crow Point, will also continue to be significantly influenced by the policy on the adjacent section for Crow Point and Crow Neck.	Defences along this stretch, either in realigned or existing positions (depending upon whether realignment along this stretch was found to be appropriate), would require ongoing maintenance during this epoch.  Management of this area, particularly towards Crow Point, will also continue to be significantly influenced by the policy on the adjacent section for Crow Point and Crow Neck.

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>sediment transport processes within the outer part of the Taw/Torridge Estuary, in terms of individual impacts of realigning in this area alone and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p> <p>Pethick (2007) highlights potential risks associated with cumulative effects of ‘Managed Realignment’ in the outer estuary, and much uncertainty exists at present.</p> <p>Management of this area, particularly towards Crow Point, will also be significantly influenced by the policy on the adjacent section for Crow Point and Crow Neck.</p>		
	<p>During this period little change is expected within the Taw Estuary, with current trends expected to continue. Continued provision of defences will continue to minimise the risk of flooding.</p>	<p>During this period the impact of accelerated sea level rise will become more important.</p> <p>Overall net, slow infilling of the estuary is expected to continue. The defences along this stretch, either in their existing or realigned positions, will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p>	<p>Future change is difficult to predict due to the uncertainty of estuary development following sea level rise and climate change. The net trend of sediment infilling is expected to continue, although the supply of muddy sediment is low.</p> <p>The defences will continue to minimise the risk of flooding of lower-lying areas, although increased pressure may be placed on these defences as the estuary responds to an increased tidal prism resulting from sea level rise.</p>
7c29 – Crow Point & Crow Neck	<b>Policy = Managed Realignment</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Managed Realignment</b>
	<p>Along this part of the northern side of the estuary mouth, which encompasses both the inner and outer parts of the spit feature that extends into</p>	<p>A continuation of the ‘Managed Realignment’ policy in this epoch would allow, if found in the short term to be required for providing defence</p>	<p>A continuation of the ‘Managed Realignment’ policy in this epoch would allow, if found in the short term to be required for providing defence</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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	<p>the estuary, there is a rock revetment along Crow Neck that protects this spit feature against erosion. There is a risk it could be breached during this epoch.</p> <p>Under this policy, investigation and (if found to be appropriate to do so) implementation of 'Managed Realignment' would occur. The studies required during this stage would need to consider the impacts of implementing 'Managed Realignment' upon the wider sediment transport processes within the outer part of the Taw/Torridge Estuary, in terms of individual impacts of realigning in this area alone and cumulative impacts of undertaking realignment in this and other parts of the outer estuary system.</p> <p>Consideration as to the importance of this feature for providing defence against wave action to the inner estuary would also need to be considered. Under this policy, measures to manage the natural realignment of the spit could be undertaken if found to be required for providing defence function for the inner estuary, most likely involving intervention to repair breaches as they occur.</p> <p>If found not to be important for defence of the inner estuary, then no intervention would be expected to occur here, allowing natural processes to occur into the long term.</p>	<p>function for the inner estuary, ongoing intervention measures to repair any breaches that may occur during this epoch, whilst allowing the spit to roll back naturally as sea levels rise.</p> <p>Ongoing monitoring of the feature will also be required, and toward the end of this epoch it may become necessary to consider construction of a secondary defence line on the inner side of Crow Neck to provide support to the defence function of the spit (if studies in the short term determine that this feature does indeed provide such a defence function; it is uncertain at this time if this is the case).</p> <p>If studies in the short term find this area not to be important for defence of the inner estuary, then no intervention would be expected to occur here, allowing natural processes to occur into the long term.</p>	<p>function for the inner estuary, ongoing intervention measures to repair any breaches that may occur during this epoch, whilst allowing the spit to roll back naturally as sea levels rise.</p> <p>Ongoing monitoring of the feature will also be required, and during this epoch (if not happened in the medium term) it may become necessary to consider construction of a secondary defence line on the inner side of Crow Neck to provide support to the defence function of the spit (if studies in the short term determine that this feature does indeed provide such a defence function; it is uncertain at this time if this is the case).</p> <p>If studies in the short term find this area not to be important for defence of the inner estuary, then no intervention would be expected to occur here, allowing natural processes to occur into the long term.</p>
	The channel in the outer estuary is characterised	During this period the impact of accelerated sea	There is a high level of uncertainty with regard to



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	<p>by a number of rock outcrops which ultimately constrain channel movement. The mouth of the estuary is also constrained by the high rates of longshore transport, which have resulted in the formation of the two spits at the mouth, including this one that extends to Crow Point. Despite the trend for swash aligned along the adjacent Braunton Burrows shoreline, during this period, little change is anticipated in the rate of longshore drift; therefore this will remain a constraint on the mouth.</p> <p>The defences along this stretch will remain the same as today; therefore the trend of dune erosion at Crow Neck, which is expected to continue, should be controlled by the defences here.</p>	<p>level rise and changes in the alignment of the Pebble Ridge, along the open coast to the south of this area, may start to have an impact on the estuary and in particular the outer estuary (including this stretch).</p> <p>A net trend of continued, slow infilling of the estuary is expected under a scenario of sea level rise and the estuary will also attempt to widen at its mouth (Pethick, 2007). The channel bed is over-deepened by more than 15m below its present level, and therefore sea level rise is not predicted to cause an increase in channel size, rather a reduction of infilling rates (Pethick, 2007). There are geological constraints, but also the strong longshore movement of sand has also been a constraint on the mouth width. The rate of sediment transport from the Northam Burrows frontage to the south of this stretch may be affected by any breaches occurring during this period along that stretch, although sand may still be transported in the nearshore zone. The cobble ridge along the northern shore of Northam Burrows, opposite this area of Crow Neck and Crow Point, will provide some protection in that area; therefore it is possible that the shoreline along the northern side of the mouth, including this stretch, will suffer greater erosion (Pethick, 2007).</p>	<p>how the estuary will evolve as sea level rises. In general the trend of slow infilling is expected to continue, with sediments from alongshore and the nearshore being moved into the estuary. The mouth of the estuary will also attempt to widen in response to an increased tidal prism. The cobble ridge along the northern shore of Northam Burrows, opposite this stretch, will provide some protection to that area; therefore it is possible that the shoreline along the northern side of the mouth, including this stretch, will suffer greater erosion (Pethick, 2007).</p> <p>The estuary will remain a net sink for sediment and as demand for sediment increase; this could result in increased erosion of the open coast shorelines as more sediment is moved into the estuaries. It is, however, very difficult to quantify such impacts, without further study.</p>
7c30 – Braunton Burrows	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This frontage is largely undefended apart from a	The ineffective groynes at Airy Point would fail	Under this scenario, if funds are not available to

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	<p>series of groynes at Airy Point and a blockwork wall and gabions at the northern end of Saunton Sands, protecting a number of properties at Saunton.</p> <p>Under this scenario, the groynes at Airy Point, which have limited effect, would not be maintained and as such they would deteriorate during this epoch.</p> <p>It is unlikely that maintenance of the defences at Saunton would attract public funds for maintenance and improvements likely to be required to provide current levels of protection as sea levels rise.</p> <p>However, if alternative (private) funds were available for this purpose, there is no reason not to permit their retention and improvement (re-building) to continue to protect individual properties from a processes point of view, so long as the structures remain as linear (seawall/revetment) structures.</p> <p>If alternative funds are available, then defences along this section that protect individual properties would need to be re-built to be much larger than at present in order to continue to provide adequate protection in the longer term as sea levels rise and defences become increasingly exposed to more frequent storm events.</p>	<p>during this epoch due to lack of maintenance under this scenario.</p> <p>If funds are not available to maintain and replace the defences at Saunton, then they are also likely to deteriorate and fail during this period. Under this scenario, if defences are not maintained, measures to adapt to the loss of defences in the medium to long term will be required.</p> <p>If defences at Saunton have been maintained and upgraded in the short term by means of alternative funds, then these could be maintained under this scenario as there is no reason not to permit this from a processes point of view.</p>	<p>maintain defences at Saunton in the preceding two epochs, then this section would be undefended during this epoch.</p> <p>However, if alternative funds are available, then there would be no reason not to permit private landowners to continue to protect individual properties during this period from a processes point of view, although it will become increasingly technically difficult and expensive to do so.</p>
	<p>This frontage comprises the extensive dune system of Braunton Burrows which is fronted by</p>	<p>Failure of the defences along this section (or even continued defence at Saunton if funds are</p>	<p>During this period a key influence on this beach-dune system will be any change in sediment input</p>

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	<p>a wide sandy beach. The beach is controlled by the headland of Saunton Down in the north, and by the headland to the south near Westward Ho! As such the beach is predicted to remain generally stable during this epoch, although the southern section will be influenced by any changes in the Taw/Torridge estuary. Any sediment eroded may be returned to the shoreline from offshore stores.</p> <p>The groynes at Airy Point are largely ineffective and thus not considered to have a significant impact on future processes. Any impact they do have will diminish further during this epoch as they deteriorate due to lack of maintenance under this scenario.</p> <p>The defences at the northern end of this stretch at Saunton protect individual properties from the risk of overtopping and erosion. They are backed by the steeply rising, largely resistant cliffs of Saunton Down. Therefore, even if defences were not present here, the evolution of the shoreline in this area would occur in much the same way as the resistance of the cliffs (rather than defences) would constrain erosion processes.</p>	<p>available) is unlikely have a significant impact on the behaviour of the larger scale dune system, and this system is expected to remain fairly resilient to change.</p> <p>There are likely to be localised areas of accretion and erosion, with the possible development of blow-outs at some locations. Overall the dune system is expected to maintain a net positive budget.</p> <p>If a blow-out were to develop along the central section there is a risk that the backing slack areas could become flooded on every spring tide.</p> <p>The impacts of sea level rise may start to felt during this period; however, the primary driver of dune erosion is likely to be the frequency of storm events and the coincidence of surges with high wave activity. Actual erosion and accretion rates along the frontage will be dependent upon the future frequency and strength of storm events, which is when the majority of the dune erosion will take place. There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change. Any sediment eroded from the dunes is expected to remain within the system; therefore the dune system as a whole is likely to remain relatively robust.</p> <p>The future evolution of this frontage is also linked</p>	<p>due to either the change in shoreline orientation along the Pebble Ridge and Northam Burrows to the south or changes in the estuary tidal delta resulting from changes in the estuary regime.</p> <p>Although the dune system as a whole is expected to remain fairly resilient to change, this period could be one of shoreline retreat and erosion of the fronting dunes.</p> <p>A primary driver of dune erosion will also be the frequency of storm events and the coincidence of surges with high wave activity. There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change. Any sediment eroded from the dunes is expected to be moved into the sediment circulatory system, but the return of sediment to this shoreline may be reduced due to the reasons stated above.</p> <p>A breach is considered unlikely due to the width of the dunes, but erosion of the frontal dunes may lead to slacks become flooded on every high tide.</p>

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		to changes within the Taw/Torridge estuary system and in particular the tidal delta, which plays an important role in terms of sediment circulation within the Bay. This delta allows sand to bypass the estuary mouth, while maintaining an open channel to the sea (Pethick, 2007).	
7c31 – Saunton Down	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section of cliffed coastline is undefended.	No defences.	No defences.
	<p>The headland of Saunton Down is characterised by a rock platform and lower cliff composed of resistant shales, overlain by raised beach deposits consisting of mainly of sands with pebble layers and some shingle.</p> <p>This headland is predicted to continue to evolve as historically. The resistant shale deposits will change very little, but where the softer raised beach deposits outcrop there is a risk of erosion through either toe erosion or sub-serial weathering, which could result in a few metres of erosion during a single event.</p>	<p>Erosion of the headland is predicted to continue as historically: at Saunton Down there is a risk that a landslide event could cause up to 50m erosion.</p> <p>During this period, the resistant rock platform will continue to afford some control on the backing cliffs, but there is a risk of erosion, through sub-aerial processes of the sandy cliffs above.</p>	<p>Erosion of the cliffs either side of Croyde Bay, will continue as historically, although there is a risk that sub-aerial weathering of the softer cliffs could increase should precipitation increase in the future due to climate change. Baggy Point is expected to erode very slowly (i.e. less than 5m erosion by year 50), but at Saunton Down there is a risk that a landslide events could cause up to 50m erosion at any one location, although along the remainder of the coast change could be less than 10m. At the northern end of the Bay erosion of the low cliffs could occur following failure of the defences and retreat could be in the region of 5 to 40m.</p>
<b>POLICY SCENARIO AREA: SAUNTON DOWN TO BAGGY POINT (CROYDE BAY)</b>			
<p>This short mostly undefended section of coastline is characterised by headlands at Saunton Down and Baggy Point encompassing the wide sheltered bay of sandy beach and dune system.</p> <p>There is one SSSI notable for its geology and nature conservation value, namely Saunton to Baggy Point Coast. This section also forms part of the wider UNESCO Biosphere transition zone. This impressive landscape is also within the nationally important North AONB and Heritage Coast. Croyde and Georham are Conservation Areas within this section of coast and there are numerous archaeological sites within the study area but no Scheduled Monuments.</p>			

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<p>This stretch of coast is a major attraction to bathers and surfers from within the South West and nationally. A series of holiday parks and camping sites are located on farmland along the coast, benefiting the local village economies of Croyde and Braunton. The South West Coast path hugs the peninsula providing access to the coast.</p> <p>The long-term vision for this area is to continue to allow the coast to evolve naturally, thus conserving its important landscape character. Continued protection of distinct places such as Middleborough Hill could be considered as retention of the existing seawall-type defences in these areas will not adversely affect coastal processes in a wider area; however, future provision of defence in these areas is unlikely to attract public funds from the flood and coastal defence budget and will therefore depend on availability of alternative funds.</p>			
7c32 – Croyde Sands	<p><b>Policy = No Active Intervention</b></p> <p>This section is undefended and will continue to be undefended in terms of coastal defence structures.</p> <p>However, localised dune management to address recreational erosion of the dunes, along with activity to manage the outflow of the channel that discharges to the sea in this area, could occur.</p>	<p><b>Policy = No Active Intervention</b></p> <p>This section is undefended and will continue to be undefended in terms of coastal defence structures.</p> <p>However, localised dune management to address recreational erosion of the dunes, along with activity to manage the outflow of the channel that discharges to the sea in this area, could occur.</p>	<p><b>Policy = No Active Intervention</b></p> <p>This section is undefended and will continue to be undefended in terms of coastal defence structures.</p> <p>However, localised dune management to address recreational erosion of the dunes, along with activity to manage the outflow of the channel that discharges to the sea in this area, could occur.</p>
	<p>Croyde Bay is enclosed by the resistant headlands at Saunton Down and Baggy Point. It is thought to be a 'closed system' in terms of sediment transport, with sediment tending to be internally redistributed. The Bay itself is characterised by a wide sandy beach backed by dunes (as covered by this section).</p> <p>The headland of Saunton Down is characterised by a rock platform and lower cliff composed of resistant shales, overlain by raised beach deposits consisting of mainly of sands with pebble layers and some shingle.</p> <p>This headland is predicted to continue to evolve as historically. The resistant shale deposits will</p>	<p>Erosion of the headland is predicted to continue as historically, with a risk that a landslide event at Saunton Down that could cause up to 50m erosion.</p> <p>During this period, the resistant rock platform will continue to afford some control to the backing cliffs, but there is a risk of erosion, through sub-aerial processes of the sandy cliffs above.</p> <p>The beach in the centre of Croyde Bay has historically been relatively stable due to the headlands that control the evolution of the bay, and it is predicted to continue to remain so during this period, despite sea level rise. There</p>	<p>Erosion of the cliffs along the south side of Croyde Bay, will continue as historically, although there is a risk that sub-aerial weathering of the softer cliffs could increase should precipitation increase in the future due to climate change.</p> <p>Along Saunton Down there is a risk that a landslide event could cause up to 50m erosion at any one location, although along the remainder of the coast change could be less than 10m.</p> <p>Any sediment that was released by cliff erosion would be added to the beach at Croyde.</p> <p>The beach in the centre of Croyde Bay has historically been relatively stable due to the protective influence of headlands. During this</p>

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	<p>change very little, but where the softer raised beach deposits outcrop there is a risk of erosion through either toe erosion or sub-serial weathering, which could result in a few metres of erosion during a single event.</p> <p>The beach in the centre of the Bay has historically been relatively stable due to protection afforded by the headlands, and this trend is predicted to continue during this period. Any sediment eroded from the beach or dune face is likely to be retained and redistributed within the bay.</p> <p>Measures to manage the channel outflow in this area, or to address dune erosion caused by footfall, are unlikely to impact significantly upon these natural processes.</p>	<p>may be localised areas of dune erosion, mainly driven by human activity, but any slight erosion is not predicted to affect the integrity of the beach or the wide dune system backing it, with any sediment eroded from the beach or dune face likely to be re-deposited within the bay.</p>	<p>period, however, raised water levels, due to sea level rise, may mean that the foot of the dunes is reached more frequently, resulting in erosion. This may also result in dunes retreating landwards in the longer term, which in turn could begin to impact upon properties located inland.</p> <p>During quiescent times some of this material will be returned to the dunes, but it is possible that a net trend of retreat could be initiated, particularly considering the little or no new input of sediment to this system. Actual rates of erosion will be dependent upon the future frequency and strength of storm events, which is when the majority of the dune erosion will take place.</p> <p>There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change.</p>
<b>7c33 – Middleborough Hill (Croyde Bay north)</b>	<p><b>Policy = No Active Intervention</b></p> <p>This section at the northern end of Croyde Bay is comprised of largely undefended low-lying cliffs, apart from a short length of seawall that protect individual properties.</p> <p>These are unlikely to attract public funds to replace them in the long term, and as such no maintenance of the defences is anticipated during this period. As such, these defences could deteriorate during this epoch.</p>	<p><b>Policy = No Active Intervention</b></p> <p>Without maintenance, the seawall along this northern end of Croyde Bay would be expected to fail during this period.</p> <p>However, if alternative funds are available, there is no reason not to allow retention of defences from a processes point of view. This would require defences to be re-built to be much larger than the existing structures during the early part of this period, such that they provide the required</p>	<p><b>Policy = No Active Intervention</b></p> <p>Without maintenance, there would be no defences present along this stretch in this period.</p> <p>However, if alternative funds are available, there is no reason not to allow retention of defences from a processes point of view. If maintained and re-built in the short and medium terms, then defences would need ongoing maintenance during this period.</p>

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	However, if alternative funds area available, there is no reason not to allow retention of defences from a processes point of view.	level of protection in the long-term.	
	<p>This section on the northern side of Croyde Bay extends along the low-lying cliffs situated at the eastern (landward) end of Baggy Point, the northern headland that encloses the bay and controls the bay's evolution.</p> <p>The headland of Baggy Point is characterised by a rock platform and lower cliff composed of resistant shales, overlain by raised beach deposits consisting of mainly of sands with pebble layers and some shingle.</p> <p>This headland is predicted to continue to evolve as historically. The resistant shale deposits will change very little, but where the softer raised beach deposits outcrop there is a risk of erosion though either cliff toe erosion or sub-serial weathering, which could result in a few metres of erosion during a single event.</p> <p>Cliff erosion along parts of this section at the northern end of Croyde Bay will be prevented by the continued presence of the short length of defences; this effect would remain during this epoch even without maintenance.</p>	<p>Erosion of Baggy Point is predicted to continue as historically, with the headland expected to erode very slowly (i.e. less than 5m erosion by year 50).</p> <p>During this period, the resistant rock platform will continue to afford some control on the backing cliffs, but there is a risk of erosion, through sub-aerial processes of the raised beach deposits above.</p> <p>If not maintained by alternative funds, the failure of the short length of seawall along part of this section during this period may result in some additional localised cliff erosion and this could be between 0 to 15m, although the rock platform along this stretch could afford some protection from wave attack as along the undefended parts of this section.</p> <p>This would be prevented if defences are retained by alternative funds.</p>	<p>Erosion of the cliffs along this section of the northern part of Croyde Bay, will continue as historically, with the previously defended part also evolving naturally following the loss of defences in the medium term.</p> <p>Baggy Point is generally expected to erode very slowly (i.e. less than 10m erosion by year 100), although erosion of the low cliffs along this section of Croyde Bay could occur in the region of 5 to 40m.</p> <p>Any sediment that was released by cliff erosion would be added to the beach at Croyde.</p>
7c34 – Middleborough Hill (Croyde Bay north) to Baggy	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section is undefended.	No defences.	No defences.
	Croyde Bay is enclosed by the resistant headlands	Erosion of the headland is predicted to continue	Erosion of the cliffs at Baggy Point will continue as

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<b>Point</b>	<p>at Saunton Down and Baggy Point. It is thought to be a 'closed system' in terms of sediment transport, with sediment tending to be internally redistributed. The Bay itself is characterised by a wide sandy beach backed by dunes.</p> <p>The headland of Baggy Point is characterised by a rock platform and lower cliff composed of resistant shales, overlain by raised beach deposits consisting of mainly of sands with pebble layers and some shingle.</p> <p>This headland is predicted to continue to evolve as historically. The resistant shale deposits will change very little, but where the softer raised beach deposits outcrop there is a risk of erosion though either cliff toe erosion or sub-serial weathering, which could result in a few metres of erosion during a single event.</p>	<p>as historically, with Baggy Point expected to erode very slowly (i.e. less than 5m erosion by year 50).</p> <p>During this period, the resistant rock platform will continue to afford some control on the backing cliffs, but there is a risk of erosion, through sub-aerial processes of the raised beach deposits above.</p>	<p>historically, although there is a risk that sub-aerial weathering of the softer cliffs could increase should precipitation increase in the future due to climate change. Baggy Point is expected to erode very slowly (i.e. less than 5m erosion by year 50).</p> <p>Any sediment that was released by cliff erosion would be added to the beach at Croyde.</p>
<b>POLICY SCENARIO AREA: BAGGY POINT TO MORTE POINT (WOOLACOMBE BAY)</b>			
<p>This short section of mainly undefended coastline is characterised by headlands at Baggy Point and Morte Point encompassing a wide sheltered bay of sandy beaches and dune systems.</p> <p>There are four SSSIs notable for their geology and nature conservation value, namely Saunton to Baggy Point Coast, Barricane beach, Mill Rock and Morte Point. This section also forms part of the wider UNESCO Biosphere transition zone. This impressive landscape is also within the nationally important North AONB and Heritage Coast. Woolacombe is a Conservation Area within this section of coast and there are numerous archaeological sites within the study area but no Scheduled Monuments.</p> <p>This stretch of coast is a major attraction to bathers and surfers from within the South West and nationally. A series of holiday parks and camping sites are located on farmland along the coast, benefiting the local village economies of places like Woolacombe. The South West Coast path hugs the peninsula providing access to the coast.</p> <p>The long-term vision for this area is to continue to allow the coast to evolve naturally, thus conserving its important landscape character. Continued protection of distinct places such as Putsborough Sands could be considered as retention of the existing seawall-type defences in these areas will not adversely affect coastal processes in a wider area; however, future provision of defence in these areas is unlikely to attract public funds from the flood and coastal defence budget and will therefore depend on availability of</p>			



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alternative funds.			
7c35 – Baggy Point to Napps Cliff (Putsborough)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this section of cliffed coast.	No defences.	No defences.
	Woolacombe Bay is controlled by the erosion-resistant headlands of Baggy Point to the south and Morte Point to the north. This section encompasses the northern side of Baggy Point up to the Putsborough.  The headland is resistant and predicted to continue to erode at the very low rates experienced historically; erosion is likely to be in the form of small, infrequent rock falls; therefore negligible erosion is predicted during this period, but the occurrence of very localised events, which are likely to result in less than 10m erosion, is possible.	The resistant headland of Baggy Point will change very little during this period, although there is a risk of localised erosion events occurring, which are likely to result in less than 10m erosion.	There will be very little change along the resistant headland of Baggy Point, although local cliff fall events may occur, erosion of less than 10m is likely. Sea level rise is unlikely to accelerate this process.
7c36 – Putsborough Sands and Vention	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	Most of the frontage is undefended, although there are local defences at Putsborough/Vention, in the form of concrete and masonry walls that protect individual properties, and rock revetment which protects the car park at the southern end. Along the northern part of this section, a concrete revetment prevents erosion of the backing dunes.  It is unlikely that these defences would attract public funds for maintenance and improvements	If funds are not available to maintain and replace the defences along this section, then they are likely to deteriorate and fail during this period as they reach the end of their design life.  If defences are not maintained, measures to adapt to the loss of defences in the medium to long term will be required.	Any defences that have not been maintained due to a lack of funds, will have deteriorated and failed in the medium term, and so only the residual remains of defences will be present during this period.  If alternative funds are available, then there would be no reason not to permit private landowners to continue to protect individual properties during this period, although it will become increasingly

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	<p>likely to be required to provide current levels of protection as sea levels rise. As such no maintenance of the defences is anticipated during this period.</p> <p>However, if alternative (private) funds were available for this purpose, there is no reason not to permit their retention and improvement (re-building) to continue to protect individual properties from a processes point of view, so long as the structures remain as linear (seawall/revetment) structures; any structures that interrupt longshore sediment transport would not be appropriate as they would have detrimental effects upon the sediment transport system within the wider Woolacombe Bay.</p> <p>If alternative funds are available, there is no reason – from a processes point of view – why they could not be retained, although defences here would only be acceptable if they continue to be linear type (seawalls and revetments) and are acceptable in landscape and biodiversity terms.</p> <p>If this is the case, then defences along this section that protect individual properties would need to be re-built to be much larger than at present in order to continue to provide adequate protection in the longer term as sea levels rise and defences become increasingly exposed to more frequent storm events. However, groynes or other shoreline control structures would interrupt sediment transport and affect other parts of</p>		<p>technically difficult and expensive to do so.</p> <p>It could therefore be very likely that it is not possible to re-build the defences once they reach the end of their design life and so measures to adapt to this situation as and when it occurs, will need to be developed in this period.</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>Woolacombe Bay, so they would not be supported by the Plan.</p> <p>Currently dune management is carried out, and this is assumed to continue under this scenario during this period in support of the ongoing maintenance of the private defences.</p>		
	<p>Woolacombe Bay is controlled by the erosion-resistant headlands of Baggy Point to the south and Morte Point to the north. The bay itself comprises Woolacombe Sand; a wide sandy beach backed by dunes and Woolacombe Down. This section represents the southern end of this feature and is referred to as Putsborough Sands.</p> <p>The frontage as a whole is predicted to remain largely stable during this epoch due to the controlling nature of the headlands.</p> <p>The frequency of storm events will be the key control on the rate of future dune erosion in this area. Any sediment eroded from the dunes will become deposited on the beach, and therefore may return to the dunes during quiescent periods, as cross-shore transport is dominant in Morte Bay. It is also possible that some sediment may be lost offshore. Overall the dune system should change little during this period, but it will be vulnerable to human pressures.</p> <p>At Putsborough there could be issues of cliff erosion along the car park. If alternative funds are available, the defences along this stretch would</p>	<p>At Putsborough any remaining defences that have been maintained by private funds will become less effective with erosion of the cliffs along the car park and also increasing flood risk to the private properties.</p> <p>As the rock revetment fronting the dunes becomes less effective (unless it is upgraded), erosion of the dunes will recommence; this is likely to be mainly during storm events. Erosion along this stretch could be in the region of 5 to 25m by the end of this period.</p> <p>The primary drivers of dune erosion will be the frequency of storm events and the coincidence of surges with high wave activity and the impact of human use of the dunes. Actual erosion and accretion rates along the frontage will be dependent upon the future frequency and strength of storm events, which is when the majority of the dune erosion will take place, but under a scenario of sea level rise, waves will reach the dune toe more frequently. There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks</p>	<p>Erosion of the dunes will be driven by storm events; however there is large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change. Without management of the dunes, any erosion may also be exacerbated by human use of the dunes.</p> <p>At Putsborough, where the dune belt is narrow already and the revetment defence fronting the dunes is likely to have failed by this period, the relict cliffs of Woolacombe/Pickwell Down that back the dunes may become exposed to the waves and therefore erosion may occur. Erosion along this stretch is expected to be in the region of 10 to 50m by the end of this period. This would add sediment to the system, but it is not predicted that a significant quantity would be released during this period.</p> <p>Where defences may have been maintained along localised parts of the frontage, such erosion will be prevented.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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	<p>need to be replaced with much larger, expensive, structures better suited to addressing the increasing pressures caused by sea level rise and greater wave exposure in the medium and long term.</p> <p>Despite maintenance, defences along the private properties could also start to become less effective during this period; these properties tend to be located on more resistant rock outcrops therefore the key risk could be from overtopping during extreme events.</p> <p>To the north, the rock revetment along the dunes may become less effective during this period, which may result in increase erosion of the backing dunes.</p>	<p>change, as a result of climate change.</p> <p>This is essentially a closed sediment system, therefore sediment eroded from the dunes should become deposited on the beach, but there may also be a loss of sediment offshore.</p>	
7c37 – Vention to Woolacombe Beach (Woolacombe Sands)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>This section is undefended in terms of coastal defence structures, although dune management is carried out, primarily to address erosion caused by recreational use of the dunes. Whilst unlikely to attract public funds, there is no reason not to permit this dune management to continue during this period.</p>	<p>No defences would be present, although there is no reason not to permit dune management during this period to address localised dune erosion caused by recreational use of the dunes.</p>	<p>No defences would be present, although there is no reason not to permit dune management during this period to address localised dune erosion caused by recreational use of the dunes.</p>
	<p>Woolacombe Bay is controlled by the erosion-resistant headlands of Baggy Point to the south and Morte Point to the north. This part of the bay comprises Woolacombe Sand; a wide sandy beach backed by dunes and Woolacombe Down.</p>	<p>The primary drivers of dune erosion will be the frequency of storm events and the coincidence of surges with high wave activity and the impact of human use of the dunes. Actual erosion and accretion rates along the frontage will be dependent upon the future frequency and</p>	<p>Erosion of the dunes will be driven by storm events; however there is large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change. Without management of the dunes, any erosion may also be exacerbated by human use of the</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>The frontage as a whole is predicted to remain largely stable during this epoch due to the controlling nature of the headlands.</p> <p>The frequency of storm events will be the key control on the rate of future dune erosion. Any sediment eroded from the dunes will become deposited on the beach, and therefore may return to the dunes during quiescent periods, as cross-shore transport is dominant in Woolacombe Bay. It is also possible that some sediment may be lost offshore. Overall the dune system should change little during this period, but it will be vulnerable to human pressures.</p>	<p>strength of storm events, which is when the majority of the dune erosion will take place, but under a scenario of sea level rise, waves will reach the dune toe more frequently. There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change.</p> <p>This is essentially a closed sediment system, therefore sediment eroded from the dunes should become deposited on the beach, but there may also be a loss of sediment offshore.</p>	<p>dunes. Retreat of the dunes through a roll back process is not possible due to the backing topography of Woolacombe Down; therefore it is likely that the dune belt will narrow in the future.</p> <p>Where the dunes narrow sufficiently, the relict cliffs may become exposed to the waves and therefore erosion may occur. This would add sediment to the system, but it is not predicted that a significant quantity would be released during this period.</p>
7c38 – Woolacombe Beach	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section is undefended.	No defences.	No defences.
	<p>This section encompasses the northern part of the wide sandy beach located within Woolacombe Bay, which is backed by dunes and Woolacombe Down. Along this section the dunes have been impacted by the construction of infrastructure along the top of them, although the seaward face is undefended.</p> <p>The frontage as a whole is predicted to remain largely stable during this epoch due to the controlling nature of the headlands at either end of Woolacombe Bay.</p> <p>The frequency of storm events will be the key control on the rate of future dune erosion. Any</p>	<p>The primary drivers of dune erosion will be the frequency of storm events and the coincidence of surges with high wave activity and the impact of human use of the dunes. Actual erosion and accretion rates along the frontage will be dependent upon the future frequency and strength of storm events, which is when the majority of the dune erosion will take place, but under a scenario of sea level rise, waves will reach the dune toe more frequently. There is, however, currently large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change.</p> <p>This is essentially a closed sediment system,</p>	<p>Erosion of the dunes will be driven by storm events; however there is large uncertainty over whether frequency of storms will increase, or storm tracks change, as a result of climate change. Without management of the dunes, any erosion may also be exacerbated by human use of the dunes. Retreat of the dunes through a roll back process is not possible due to the backing topography of Woolacombe Down; therefore it is likely that the dune belt will narrow in the future.</p> <p>Where the dunes narrow sufficiently, the relict cliffs may become exposed to the waves and therefore erosion may occur. This would add sediment to the system, but it is not predicted</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	sediment eroded from the dunes will become deposited on the beach, and therefore may return to the dunes during quiescent periods, as cross-shore transport is dominant in Woolacombe Bay. It is also possible that some sediment may be lost offshore. Overall the dune system should change little during this period, but it will be vulnerable to human pressures.	therefore sediment eroded from the dunes should become deposited on the beach, but there may also be a loss of sediment offshore.	that a significant quantity would be released during this period.
7c39 – Woolacombe to Morte Point	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this cliffed section of coast, which is interrupted by two small pocket beaches.	No defences.	No defences.
	<p>This section encompasses the cliffed section of Woolacombe Bay to the erosion resistant headland of Morte Point, which, along with Baggy Point to the south, exerts significant geological control on the evolution of Woolacombe Bay. Barricane Beach and Grunta Beach are small pocket beaches situated along this section, separated from the larger Woolacombe Sand to the south by smaller headlands.</p> <p>The headlands along this section are resistant and are predicted to continue to erode at the very low rates experienced historically; erosion is likely to be in the form of small, infrequent rock falls; therefore negligible erosion is predicted during this period, but the occurrence of very localised events, which are likely to result in less than 10m erosion, is possible.</p>	<p>The resistant headlands will change very little during this period, although there is a risk of localised erosion events occurring.</p> <p>The pocket beaches of Barricane Beach and Grunta Beach, are predicted to remain stable, although sea level rise could begin to cause narrowing and steepening as a result of coastal squeeze against the backing, erosion resistant cliffs.</p>	<p>There will be very little change along the resistant headlands, although local cliff fall events may occur. Sea level rise is unlikely to accelerate this process.</p> <p>Barricane Bay, to the north of Woolacombe, is predicted to experience narrowing and steepening as a result of coastal squeeze against the backing, erosion resistant cliffs, as sea levels rise.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	The pocket beaches of Barricane Beach and Grunta Beach, to the north of Woolacombe, are predicted to remain stable.		
<b>POLICY SCENARIO AREA: MORTE POINT TO FORELAND POINT</b>			
<p>This section of coastline starts at the prominent Morte Point and stretches approximately 50km east to Minehead and is varied in its character; it includes several bays, such as Combe Martin and Lynmouth, large headlands, including Foreland Point, and numerous smaller bays and rocky headlands.</p> <p>Exmoor Coastal Heaths are a designated SSSI and SAC. This coastline is rich in geological and ecological features and contains five designated SSSIs, namely Morte Point, Hele Samsons and Combe Martin Bays, Napps Cave, and West Exmoor Coast and Woods. The coast between Morte Point and Lynton also forms part of the wider UNESCO Biosphere transition zone. This stunning stretch of coastline includes the nationally designated Exmoor National Park, North Devon AONB and Heritage Coast; it also has a number of Conservation Areas and numerous Scheduled Monuments.</p> <p>This largely rural coastline is predominantly undefended, although localised defences are present at the numerous small settlements, characterised by steep river valleys leading to historic fishing or trading ports including Ilfracombe, Combe Martin, Lynton and Lynmouth. This coastline is accessible by the South West Coast Path.</p> <p>The long-term vision for this area is to continue to allow it to evolve naturally, thus conserving its important landscape character. However, it is recognised that there is a need to continue to protect some distinct locations, but this will not adversely affect coastal processes in a wider area. To this end, existing defences will be retained over the long term at places such as Lee, Ilfracombe, Combe Martin and Lynmouth.</p> <p>However in some areas such as at Lee Bay and Watermouth Slipway, future defence provision is unlikely to attract public funds from the flood and coastal defence budget. Continued protection in such areas could be considered as retention of the existing seawall-type defences in these areas will not adversely affect coastal processes in a wider area; however, future provision of defence in these areas is unlikely to attract public funds from the flood and coastal defence budget and will therefore depend on availability of alternative funds.</p>			
7d01 – Morte Point to Lee (west)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this cliffed coastline.	No defences.	No defences.
	This frontage is comprised of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion. These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the	As the cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall	Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but there will be restricted

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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	<p>region of a few hundred metres, since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similar little change is expected to occur within the many small embayments, which effectively form a series of closed sediment systems. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>Morte Point will prevent any incoming sediment input into this frontage, acting as a barrier to transport from further west and also the indented nature of this shoreline means that there is limited connectivity between the bays. New sediment input to the beaches is therefore dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in some of the smaller pocket beaches becoming permanently submerged, as retreat of the beaches is not possible due to the resistant cliffs to landward. Elsewhere beach narrowing is likely to occur. Small beaches may remain at the toe of the cliffs, where fed by rock fall events.</p>	<p>to very localised areas.</p> <p>The embayments are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change. Within the smaller pocket bays beaches may disappear.</p>
7d02 – Lee	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>Whilst being comprised largely of undefended cliffs, there are localised defences in the form of a seawall within Lee Bay that provides protection against flooding and erosion. These defences are likely to require some maintenance during this epoch.</p>	<p>The short length of seawall defence within Lee Bay is likely to require upgrading during this epoch in order for adequate levels of protection to continue to be provided.</p>	<p>Ongoing maintenance of the defences within Lee Bay will be required during this epoch.</p>
	<p>This frontage is comprised of areas of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion. These embayments are effectively closed</p>	<p>As the cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20</p>	<p>Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea</p>



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast (where it remains undefended) is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similarly little change is expected to occur within the small embayment of Lee Bay encompassed by this section, which effectively is a closed sediment system. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p> <p>The existing defences within Lee Bay will continue to provide defence but the risk of overtopping may increase.</p>	<p>years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>Morte Point will prevent any incoming sediment input into this frontage, acting as a barrier to transport from further west and also the indented nature of this shoreline means that there is limited connectivity between the bays. New sediment input to the beaches is therefore dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in some narrowing of the small pocket beaches along this section, which in places may even become submerged. Small beaches may remain at the toe of the cliffs, where fed by rock fall events.</p> <p>At Lee Bay the risk of overtopping and flooding of the properties will increase requiring improvement of the defences, although they will still prevent erosion of the resistant cliffs behind. These improvements would require defences to be re-built to be much larger than at present, such that they are able to provide adequate levels of protection in the long-term as sea levels rise and the frequency of storm events may increase.</p>	<p>level rise. Localised cliff falls will be the main mechanism of retreat, but these will be restricted to very localised areas.</p> <p>The embayments along this stretch are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change. It is possible that some parts of these small pocket beaches could disappear. Shoreline narrowing is predicted at Lee Bay resulting in the risk of overtopping increasing. Improvements to the defences made in the medium term will need to have accounted for this, and so the re-built defences should only require ongoing maintenance as a result.</p>
7d03 – Lee (east)	Policy = No Active Intervention	Policy = No Active Intervention	Policy = No Active Intervention

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
to Ilfracombe (west)	There are no defences along this cliffed coastline.	No defences.	No defences.
	<p>This frontage is comprised of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion. These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres, since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similar little change is expected to occur within the many small embayments, which effectively form a series of closed sediment systems. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>As the cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>New sediment input to the beaches is dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in some of the smaller pocket beaches becoming permanently submerged, as retreat of the beaches is not possible due to the resistant cliffs to landward. Elsewhere beach narrowing is likely to occur. Small beaches may remain at the toe of the cliffs, where fed by rock fall events.</p>	<p>Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but there will be restricted to very localised areas.</p> <p>The embayments are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change. Within the smaller pocket bays beaches may disappear.</p>
7d04 – Ilfracombe	<b>Policy = Hold the Line (locally Advance the Line)</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>This stretch encompasses the town of Ilfracombe, the coastline of which is a mix of undefended cliffs and lengths of seawall that provide defence against flood risk to low-lying parts of the town. These are supported by harbour breakwater structures that also have a defence function.</p>	<p>The various seawall defences and harbour structures at Ilfracombe are likely to require upgrading during this epoch in order for adequate levels of protection to continue to be provided.</p>	<p>Ongoing maintenance of the defences and other structures at Ilfracombe will be required during this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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	<p>These defences are likely to require some maintenance during this epoch. At Ilfracombe Harbour, proposals to re-develop this area and reconfigure the harbour, including localised reclamation, could also serve to achieve the aim of the Plan.</p>		
	<p>This frontage is comprised of areas of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion. Defences along this stretch are generally situated at the back of such embayments.</p> <p>These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres since sea levels stabilised approximately 4000 years ago. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similarly little change is expected to occur within the small embayments. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p> <p>The continued maintenance of the existing defences and structures at Ilfracombe will continue to minimise the risk of overtopping and</p>	<p>As the undefended cliffs along parts of this section are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>New sediment input to the beaches along this stretch is dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in some narrowing of the small pocket beaches along this section, which in places may even become submerged. Small beaches may remain at the toe of the cliffs, where fed by rock fall events.</p> <p>Maintenance and re-construction of the defences at Ilfracombe, to be much larger than the existing defences, will continue to prevent against erosion and flooding. A small beach will be retained to the</p>	<p>Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period along the undefended cliffed parts of this section. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but these will be restricted to very localised areas.</p> <p>At Ilfracombe, there will be an increased risk of overtopping therefore defences may require upgrading to continue protecting the hinterland. Ultimately erosion and flooding will be limited by the local topography and nature of the shoreline.</p> <p>The small embayments are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change. However, a small beach may be retained to the east of Capstone Point, but this is likely to be much narrower during this period, due to sea level rise resulting in higher water levels.</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	associated flooding, but are unlikely to have any impact on down-drift coasts as there is very little littoral sediment transport to be interrupted by these structures. This would remain the case even if proposals to reconfigure Ilfracombe Harbour, including localised reclamation, were to proceed.	east of Capstone Point, due to the indented nature of this frontage.	
<b>7d05 – Ilfracombe (east – Larkstone Beach) to Hele Beach (west)</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this short length of cliffed coastline.	No defences.	No defences.
	<p>This frontage is comprised of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion. These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres, since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similar little change is expected to occur within the many small embayments, which effectively form a series of closed sediment systems. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer</p>	<p>As the cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>New sediment input to the beaches is dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in some of the small pocket beaches becoming permanently submerged, as retreat of the beaches is not possible due to the resistant cliffs to landward. Elsewhere beach narrowing is likely to occur. Small beaches may remain at the toe of the cliffs,</p>	<p>Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but there will be restricted to very localised areas.</p> <p>The small embayments are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change, and may even disappear in this epoch.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	weather.	where fed by rock fall events.	
7d06 – Hele Beach	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	Whilst being comprised largely of undefended cliffs, there are localised defences in the form of a seawall within Hele Bay that provides protection against flooding and erosion. These defences are likely to require some maintenance during this epoch.	The short length of seawall defence within Hele Bay is likely to require upgrading during this epoch in order for adequate levels of protection to continue to be provided.	Ongoing maintenance of the defences within Hele Bay will be required during this epoch.
	<p>At Hele Bay the existing defences will continue to provide defence but the risk of overtopping may increase.</p> <p>The rest of this frontage is comprised of undefended hard rock, namely slates, shales and sandstones. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Similarly little change is expected to occur within the small embayment of Hele Bay, which is effectively a closed sediment system. Storm events may affect beach levels; however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>At Hele Bay any beach narrowing will increase the pressure on the defences, and these will need to be re-built in this epoch to be much larger than the existing structures, if they are to continue to provide adequate levels of protection in the long-term.</p> <p>As the undefended cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>New sediment input to the beach within Hele Bay is dependent upon cliff erosion, which is generally negligible. Sea level rise may therefore result in</p>	<p>Shoreline narrowing is predicted at Hele Bay resulting in the risk of overtopping increasing. Improvements to the defences made in the medium term will need to have accounted for this, and so the re-built defences should only require ongoing maintenance as a result.</p> <p>The undefended cliffed parts of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but these will be restricted to very localised areas.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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		the narrowing of this small pocket beach, as retreat of the beaches is not possible due to the resistant cliffs and defences to landward. A small beach may remain at the toe of the cliffs, where fed by rock fall events.	
7d07 – Hele Beach (east) to Watermouth Slipway	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section is comprised of undefended cliffs.	No defences.	No defences.
	<p>This frontage is comprised of hard rock, namely slates, shales and sandstones with heavily indented embayments formed due to differential erosion, notably at Water Mouth. These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced slow rates of recession, in the region of a few hundred metres, since sea levels stabilised approximately 4000 years ago.</p> <p>Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Any erosion will be in the form of infrequent and small scale events.</p> <p>Storm events may affect beach levels along the exposed parts of this coast, although Water Mouth is sheltered by the presence of the headlands at its narrow entrance. It is likely, however, that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>As the cliffs are resistant, erosion is likely to be in the form of infrequent and small scale events. Therefore, in general, this coast is expected to experience negligible change over the next 20 years. Due to exposure of different rock types, there will, however, be slight variations in erosion rates along the coast, with the risk that a rock fall event could cause several metres of erosion; however this will only have implications very locally and for much of the coast the frequency of such of an event is low, i.e. every 10 to 100 years.</p> <p>The beach at Water Mouth is likely to continue to erode and narrow as sea levels rise in this period.</p>	<p>Much of this coastline will remain resistant to change, due to the nature of the geology, with negligible change predicted for this period. Rates of change are also unlikely to be affected by sea level rise. Localised cliff falls will be the main mechanism of retreat, but there will be restricted to very localised areas.</p> <p>The embayments are predicted to continue to narrow due to sea level rise and increased storminess as a result of climate change. Within the smaller pocket bays beaches may disappear. However, the beach at Water Mouth is likely to continue to erode and narrow further as sea levels rise in this period.</p>

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	The beach at Water Mouth has historically been eroding and this trend is likely to continue due to the minimal inputs of sediment from cliff erosion.		
7d08 – Watermouth Slipway	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	The various structures at Watermouth Slipway, that provide localised protection against flood risk, could be maintained in this period if non-flood and coastal defence budget funds are available for this purpose. If this is not the case then no maintenance would occur and structures would deteriorate during this period.	If they are to be maintained through non-flood and coastal defence budget funds, the structures at Watermouth Slipway are likely to need to be improved in this period if they are to continue to function as intended, and so also provide some protection against flood risk, in the face of rising sea levels.  If this is not the case then defences will further deteriorate and begin to fail during this period.	If they are to be maintained through non-flood and coastal defence budget funds, and if not happened in the medium term, the structures at Watermouth Slipway would need to be improved in this period if they are to continue to function as intended, and so also provide some protection against flood risk, in the face of rising sea levels.  If this is not the case then defences will fail during this period, increasing the risk of flooding locally.
	The beach at Watermouth has historically been eroding and this trend is likely to continue due to the minimal inputs of sediment from cliff erosion. This is unlikely to be significantly affected by continued maintenance of structures along this stretch (if non-flood and coastal defence budget funds are available for this) or even if defences are not maintained during this epoch.	The beach at Watermouth is likely to start to narrow due to the combination of high water levels, resistant cliffs and lack of new sediment inputs. This is unlikely to be significantly affected by continued presence of structures along this stretch during this epoch, whether they are maintained by non-flood and coastal defence budget means or not..	The beach at Watermouth is likely to continue to narrow due to the combination of high water levels, resistant cliffs and lack of new sediment inputs. If maintained by non-flood and coastal defence budget means, this is may begin to be affected by the continued maintenance of structures along this stretch during this epoch, which will prevent the beach retreating landwards in response. However, even if defences have not been maintained and their effect is reduced during this epoch, this would naturally be constrained in any case by the resistant, rising topography of the area.
7d09 – Watermouth	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section is comprised of undefended cliffs.	No defences.	No defences.

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<b>Slipway to Combe Martin</b>	<p>This frontage is comprised of hard rock, namely shale and sandstone, with heavily indented embayments. These embayments are effectively closed systems which are unconnected in terms of sediment transport. Historically this frontage has only experienced very slow rates of recession. Therefore future erosion is expected to be negligible and in the form of infrequent and small scale events.</p> <p>The embayments are predicted to remain generally stable during this period; storm events may affect beach levels, however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>Along most of this coast there will be negligible change in shoreline position during this period, due to the resistant nature of the cliffs.</p> <p>As a result of sea level rise the small pocket beaches that characterise this shoreline are likely to start to narrow due to the combination of high water levels, resistant cliffs and lack of new sediment inputs.</p>	<p>Negligible change is expected along this shoreline due to the resistant nature of the cliffs; however, many of the smaller pocket beaches may become permanently submerged due to high water levels as sea levels rise and the lack of fresh sediment inputs. The rate of cliff erosion is unlikely to be affected by sea level rise therefore the input of sediment to the system is expected to remain minimal. Elsewhere the beaches are likely to become narrower.</p>
<b>7d10 – Combe Martin</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>This section is comprised of both undefended cliffs, interrupted by defences in the form of a recurved seawall at Combe Martin, which will require maintenance during this epoch.</p>	<p>The defences at Combe Martin are likely to require re-building during this epoch as they reach the end of their effective life, with the new structures needing to be much larger than those they replace, such that they are able to provide adequate levels of protection in the long-term as sea levels rise and wave exposure increases.</p>	<p>The defences at Combe Martin would require ongoing maintenance during this period.</p>
	<p>This section of frontage forms an embayment that is effectively a closed system which is unconnected in terms of sediment transport. The undefended parts are comprised of hard rock cliffs, namely shale and sandstone, with heavily indented embayments. Historically this frontage has only experienced very slow rates of</p>	<p>Along most of this coast there will be negligible change in shoreline position during this period, due to the resistant nature of the undefended cliffs.</p> <p>At Combe Martin the defences will continue to protect the hinterland, although increasing pressure on the shoreline as a result of high</p>	<p>Negligible change is expected along this shoreline due to the resistant nature of the cliffs in the undefended parts, and the continued presence of defences at Combe Martin.</p> <p>At Combe Martin the defences will continue to reduce the risk of flooding and erosion. However, the small pocket beach is likely to become</p>



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	<p>recession; therefore future erosion is expected to be negligible and in the form of infrequent and small scale events.</p> <p>This embayment is predicted to remain generally stable during this period; storm events may affect beach levels, however it is likely that these will be in the nature of cyclical changes with the sediment returning during calmer weather.</p>	<p>water levels and a lack of new sediment input may cause narrowing and result in the defences becoming more vulnerable.</p>	<p>narrower due to high water levels as sea levels rise and the lack of fresh sediment inputs. The rate of cliff erosion is unlikely to be affected by sea level rise therefore the input of sediment to the system is expected to remain minimal.</p> <p>This location is also potentially vulnerable to flash flood events which may provide occasional large inputs of sediment as the slate and sandstone bedrock is likely to be eroded during such events.</p>
7d11 – Combe Martin to Lynmouth	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>There are no defences along the majority of this cliffed coastline.</p> <p>The only defences present are a short length of seawall defence at Lee Bay. These are unlikely to attract public funds to replace them in the long term, and as such no maintenance of the defences is anticipated during this period. As such, these defences could deteriorate during this epoch.</p> <p>However, if alternative funds area available, there is no reason not to allow retention of defences from a processes point of view.</p>	<p>The majority of this undefended cliffed coastline would continue to evolve naturally during this epoch.</p> <p>Without maintenance, the seawall at Lee Bay would be expected to fail during this period.</p> <p>However, if alternative funds area available, there is no reason not to allow retention of defences at Lee Bay from a processes point of view. This would require defences to be re-built to be much larger than the existing structures during the early part of this period, such that they provide the required level of protection in the long-term.</p>	<p>The majority of this undefended cliffed coastline would continue to evolve naturally during this epoch.</p> <p>Without maintenance, there would be no defences present along any part of this stretch in this period.</p> <p>However, if alternative funds area available, there is no reason not to allow retention of defences at Lee Bay from a processes point of view. If maintained and re-built in the short and medium terms, then defences would need ongoing maintenance during this period.</p>
	<p>The cliffs along this frontage are composed of sandstones with alternating slate and shale bands. Along much of the coast the cliffs are very resistant, with negligible change expected over the period. Where softer sandstones are exposed, slightly greater recession rates as</p>	<p>Along this section the cliffs are expected to change very little with only very low rates of retreat anticipated. As such, there is likely to be limited inputs of sediment to help sustain the fronting beaches, and so these beaches may narrow further during this epoch as sea levels</p>	<p>To the west of Lynmouth, the undefended cliffs will continue to behave as at present, with only very low rates of retreat anticipated. As such, inputs of sediment to the foreshore will continue to be limited and so fronting beaches are likely to narrow further, and even become permanently</p>

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	expected, but even here less than 10 metres would be expected. Along this section, to the west of Lynmouth, the cliffs tend to be fronted by only narrow talus deposits.	rise.	submerged in places, as sea level rise accelerates.
<b>7d12 – Lynmouth</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	Defences along the frontage at Lynmouth include both a seawall and harbour structures (which may provide some defence function). The seawall on the western side of the harbour is fronted by a rock and masonry revetment. Some cliff stabilisation has been undertaken at western end of Lynmouth. These defences would require maintenance during this epoch.	The various defences and structures at Lynmouth would need to be re-built during this epoch as the existing defences reach the end of their effective life.	The defences at Lynmouth, re-built in the medium term, will require ongoing maintenance during this epoch.
	At Lynmouth, the cliff stabilisation works to the west, and the seawall, which runs for over 350m from the harbour westwards along the toe of the cliffs, are expected to remain and will therefore continue to prevent any shoreline retreat. The harbour structures will also afford some protection to the town. The boulder delta at Lynmouth, a legacy of a flash flood event that occurred in 1952, is predicted to remain stable during this epoch. As such, it will continue to provide some protection to the low-lying land behind. Defences upstream on the River Lyn are expected to reduce the impacts should a similar event occur in the future.	Maintenance of the defences and river training arm at Lynmouth will continue to afford some protection to the town. The training arm may have a localised impact in trapping sediment on the western side, but due to the sediment size it is not expected to be significant. Risk of overtopping and flooding to properties along the Lynmouth frontage is predicted to increase during this epoch as sea levels rise, requiring upgrading of the defences with larger structures in order to ensure adequate levels of protection are provided in the long term.  Although the maintenance of defences will prevent further sediment input into the system, the beach at Lynmouth is likely to be protected by the boulder delta which is a legacy of a flash	Maintenance of the defences and the river training arm at Lynmouth will continue to prevent any shoreline retreat. The training arm may have a localised impact in trapping sediment on the western side, but due to sediment size it is not expected to be significant. The problem of overtopping and flooding along the Lynmouth frontage is predicted to continue during this epoch, and the upgraded defences constructed in the medium term will need to account for this to ensure that adequate levels of protection are provided in this epoch.  Although the maintenance of defences will prevent further sediment input into the system, the beach at Lynmouth is likely to be protected by the boulder delta which is a legacy of a flash

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		flood event that occurred in 1952. It is predicted to remain stable during this epoch and, as such, it will continue to provide some protection to the low-lying land behind. Defences upstream on the River Lyn are expected to reduce the impacts should a similar event occur in the future.	flood event that occurred in 1952. It is predicted to remain stable during this epoch and, as such, it will continue to provide some protection to the low-lying land behind. Defences upstream on the River Lyn are expected to reduce the impacts should a similar event occur in the future.
7d13 – Lynmouth to Foreland Point	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this section of cliffed coastline.	No defences.	No defences.
	The cliffs along this frontage are composed of sandstones with alternating slate and shale bands. Along much of the coast the cliffs are very resistant, with negligible change expected over the period. Where softer sandstones are exposed along this stretch, such as along Foreland Point, slightly greater recession rates as expected, but even here less than 10 metres would be expected.  Along this stretch there are narrow linear upper beaches, fed by local cliff erosion; these are expected to remain quite stable during this period.	Along this section to the east of Lynmouth, slightly higher erosion rates are expected due to the exposure of softer sandstone deposits. Here up to 5 to 25 metres of erosion may occur by the end of this period. This erosion will supply sediment to the beaches, which should help sustain the narrow beaches present along this stretch.	Along this stretch, erosion rates may be increased further due to sea level rise. Up to 10 to 50m of erosion may occur by year 100. This input of sediment should help to retain narrow beaches along this stretch.
<b>POLICY SCENARIO AREA: FORELAND POINT TO HURLSTONE POINT</b>			
<p>This section of coastline starts at the prominent Foreland Point and stretches eastwards to Hurlstone Point, encompassing in the eastern part Porlock Bay.</p> <p>Exmoor Coastal Heaths are a designated SSSI and SAC. This coastline is rich in geological and ecological features and contains a number of designated SSSIs, namely West Exmoor Coast and Woods, and Porlock Ridge and Saltmarsh. This stunning stretch of coastline includes the nationally designated Exmoor National Park and Heritage Coast; it also has a number of Conservation Areas and numerous Scheduled Monuments.</p> <p>This largely rural coastline is predominantly undefended, although localised privately owned defences are present at Porlock Weir. This coastline is accessible by the South West</p>			

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<p>Coast Path.</p> <p>The long-term vision for this area is to continue to allow it to evolve naturally, thus conserving its important landscape character. In some areas such as at Porlock Weir, future defence provision is unlikely to attract public funds from the flood and coastal defence budget. Retention of defences through other funding could potentially impact on a wider coastal area as to provide adequate defence in the medium to long-term will require large structures over a wider length of coastline. Therefore, whilst continued defence through private funds could occur, if funds are not available to achieve this then it is proposed to move towards No Active Intervention. In this case, currently defended areas would face increased flood and erosion risk in the medium to long term, as existing defences deteriorate and fail. It is recognised that measures need to be put in place to manage this increased risk.</p>			
7d14 – Foreland Point to Gore Point	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences present along this section.	No defences.	No defences.
	<p>This undefended frontage of sandstone and mudstone cliffs has historically been retreating very slowly and in the future erosion is predicted to occur at similar rates, with patches of localised erosion due to wave undercutting at the cliff toe. This may result in the erosion of relict landslip deposits in the upper cliffs, which would erode, but then protect the cliff toe.</p> <p>Sediment transport within this region is limited both due to the resistant nature of the cliffs, and Foreland Point acting as a barrier to drift entering the region from further west.</p>	<p>Negligible change is expected during this period along most of this frontage. Local-scale events may cause a few metres of erosion due to long-term wave undercutting at the cliff toe and localised rock slides.</p> <p>Sediment transport within this region is limited both due to the resistant nature of the cliffs, and Foreland Point acting as a barrier to drift entering the region from further west. Any sediment released from the cliffs will be transported eastwards towards Gore Point, supplying the gravel beaches fronting the cliff and potentially continuing on around into Porlock Bay.</p>	<p>The current trend of very slow retreat is expected to continue and, in general, the form of this frontage is predicted to remain similar throughout all three epochs. There is a risk that the continued undercutting at the toe of the cliffs could result in the erosion of relict landslip deposits in the upper cliffs, which would erode, but then protect the cliff toe.</p> <p>Sediment transport within this region is limited both due to the resistant nature of the cliffs, and Foreland Point acting as a barrier to drift entering the region from further west. Any sediment input through cliff erosion will be transported eastwards towards Gore Point, supplying the gravel beaches fronting the cliff and potentially continuing on around into Porlock Bay; however this is expected to be small.</p>
7d15 – Gore	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>

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Point to Porlock Weir	<p>There are no defence structures along this section, although the eastern boundary of this section is at the harbour arm associated with Porlock Weir.</p> <p>There would also be a cessation of any beach maintenance works to maintain the ridge between Gore Point and Porlock Weir under this scenario.</p>	No defences.	No defences.
	<p>Along this section from Gore Point to Porlock Weir, the structures at Porlock Weir (the eastern boundary of this section) will continue to have an impact on the local sediment drift, with sediment being held on the western side (i.e. along this section) and prevented from being transported further eastwards with Porlock Bay, as the policy at Porlock Weir under this scenario is to 'Hold the Line'.</p> <p>Without any management, the beach along this stretch will be able to respond naturally and become more dissipative by widening and flattening; however, an increased risk of overwashing is predicted during this epoch as a result, and the beach will experience net retreat towards the backing high ground.</p>	<p>The beach along this section will continue to respond naturally to rising sea levels, with the beach continuing to roll back landwards towards the backing high ground.</p> <p>Continued presence of structures at Porlock Weir to the immediate east of this stretch will aid retention of some sediment along this stretch, which may help stabilise the beach locally at the eastern end.</p>	<p>The large-scale trend of beach recession and roll-back of the gravel ridge via overwashing is predicted to continue in response to accelerating sea level rise.</p> <p>The beach along this stretch is likely to experience narrowing due to a combination of sea levels rise and limited input of sediment around Gore Point. There will therefore be an increased risk of overwashing and hinterland flooding along this stretch. In places, the beach could also become constrained in its ability to roll back as it reaches the base of the backing higher ground, thus exacerbating the beach narrowing.</p>
7d16 – Porlock Weir	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	Privately owned defences along this Porlock Weir part of the Porlock Bay frontage include a seawall and harbour arm associated. There is also an earth embankment protecting the car park along	The defences along this stretch could be maintained and improved if non-flood and coastal defence budget is available for this purpose. However, it is uncertain if even this would be technically and economically viable, particularly as	The defences along this stretch could be maintained and improved if non-flood and coastal defence budget is available for this purpose. However, it is uncertain if even this would be technically and economically viable, particularly as

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	<p>the central part of this section.</p> <p>These are unlikely to attract public funds to replace them in the long term. These defences would require maintenance and improvement during this period if non-flood and coastal defence budget funds area available. If this were not to be the case, then measures will need to be developed to adapt this area (once the defences reach the end of their effective life).</p> <p>The eastern part of this stretch towards Porlockford is comprised of soft, low cliffs that are undefended. These would continue to evolve naturally.</p>	<p>defences are likely to need to be much larger and over a wider length of frontage – with impacts on landscape and environmental features.</p> <p>If defences are not maintained or improved, they will reach the end of their effective life during this epoch.</p> <p>As such, the properties at Porlock Weir would be at increased risk of flooding and erosion, and adaptation measures may be needed to address this during this period.</p>	<p>defences are likely to need to be much larger and over a wider length of frontage – with impacts on landscape and environmental features.</p> <p>If defences are not maintained or improved in the previous epochs, there would be no defences present at Porlock Weir during this epoch, allowing this section of coast to evolve naturally along with the rest of the wider Porlock Bay.</p>
	<p>Between Gore Point and Porlockford cliffs, the defences along this section at Porlock Weir will continue to have some impact on the local sediment drift, with sediment being held on the western side. The defences here also appear to have interrupted the occasional westwards drift of sediment, which has resulted in as lobe of shingle at this location. This area is therefore expected to remain in a similar state to present.</p> <p>Along Porlockford cliffs at the eastern end of this stretch, cliff recession is likely to continue, albeit at the slow rates experienced recently, i.e. less than 0.5m/year. Overall this stretch will remain quite stable due to the influence of the Porlock Weir, though any erosion may impact upon road access to Porlock Weir.</p>	<p>If maintained then the defences at the Weir will continue to have an impact upon sediment transport eastwards. Continued maintenance of these defences during this epoch; if it occurs; will help maintain a situation similar to today.</p> <p>However, if the defences are not maintained during this period, this restriction of sediment transport across Porlock Weir will reduce as defences deteriorate and fail.</p> <p>There will be continued erosion of Porlockford Cliffs, which could increase, both due to the limited input of sediment and sea level rise.</p>	<p>If maintained then the defences at the Weir will continue to have an impact upon sediment transport eastwards. Continued maintenance of these defences during this epoch; if it occurs; will help maintain a situation similar to today, although coastal squeeze could be an issue as the shoreline is restricted from adapting to sea level rise locally..</p> <p>If defences have not been maintained then the lack of defences at the Weir during this epoch will allow sediment to be transported to the beaches further east.</p> <p>Erosion of the undefended Porlockford cliffs to will release some sediment, but much of this is likely to be moved further eastwards. These are soft cliffs so will also be sensitive to accelerated</p>

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			sea level rise.
7d17 – Porlock Weir to Hurlstone Point	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>Along this frontage, the shingle ridge would be allowed to adapt naturally to rising sea levels, meaning it will roll back onto the low-lying land behind.</p> <p>Existing defences along this part of the Porlock Bay frontage, which include groynes associated with New Works, would not be maintained under this policy.</p> <p>This policy would not increase tidal flood risk to Porlock or Bossington. However, these settlements will remain at risk of fluvial flooding.</p> <p>Ways of adapting to this risk are currently being investigated as part of a Defra funded adaptation study being led by The National Trust.</p>	<p>There would be no defences along this section b the end of this epoch. The shingle ridge will continue to be allowed to roll back naturally as sea level rise accelerates.</p>	<p>There would be no defences along this section during this epoch. The shingle ridge will continue to be allowed to roll back naturally as sea level rise accelerates.</p>
	<p>Overall the current trends experienced along the barrier are expected to continue in the future, with the barrier being in a state of net retreat. Without any management, the barrier is able to respond naturally and become more dissipative by widening and flattening; however, a continuation of overwashing is predicted during this epoch.</p> <p>Along the undefended Porlockford cliffs, at the western end of this stretch, cliff recession is likely to continue, albeit at the slow rates experienced recently, i.e. less than 0.5m/year. Overall this stretch will remain quite stable during this period</p>	<p>There will be continued erosion of the undefended Porlockford Cliffs at the western end of this section, which could increase, both due to the limited input of sediment and sea level rise. This could begin to pose an outflanking risk to the adjacent defended stretch towards Porlock Weir.</p> <p>The 1996 breach is expected to remain open, with continued stability of the western spit and growth of the ebb tidal delta. Growth of this delta would be at the expense of the coast to the immediate west of the breach and here there is a high risk that the barrier integrity could be</p>	<p>Erosion of Porlockford cliffs along the western part of this stretch will release some sediment, much of which is likely to be moved further eastwards towards Hurlstone Point. These are soft cliffs that will also be sensitive to accelerated sea level rise, and so the rate of sediment supply to the ridge along this section could increase as a result.</p> <p>It is thought likely that the 1996 breach will remain open, due to insufficient rates of longshore drift; however, the rate of salt marsh growth behind the breach could decrease the</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>due to the influence of the Porlock Weir to the west and the ebb-tidal at the 1996 breach along this section.</p> <p>The breach is expected to remain open with continued growth of the associated ebb tidal delta. Both spits at the mouth of the breach are likely to remain relatively stable over this period. The area of salt marsh behind the ridge in the vicinity of the 1996 breach is predicted to continue to vertically accrete.</p> <p>The groynes to the east of New Works will continue to have an impact on alongshore drift and should help maintain some beach stability along the barrier along this section; however these groynes do not prevent cross-shore processes and therefore the barrier will still be prone to roll-over as gravel is pushed over the crest. They may therefore start to intercept more sediment during this period, although it is assumed that the groynes will not be maintained and so this influence is likely to reduce over time as these structures gradually deteriorate and eventually fail.</p> <p>Further eastwards the barrier is expected to remain generally stable and largely static, as it will continue to be feed with sediment from the west and is sufficiently robust. Certain sections, are however, likely to become increasingly vulnerable to overwashing and crest narrowing.</p>	<p>threatened. Alternatively, it is possible that the delta could afford some protection to the shoreline. The salt marsh behind the breach is expected to continue to vertically accrete, although its lateral extent could start to become squeezed as a result of barrier roll-back, as its landward boundary is currently fixed by field boundaries.</p> <p>There is also a risk of breaching along the eastern spit as the breach position moves progressively eastwards. The vulnerability of the barrier along this stretch will also be increased as the remaining groynes to the east of New Works deteriorate and fail and/or become less effective as the barrier retreats landwards. This would result in increased longshore drift locally and therefore the barrier along this stretch could become reduced in volume and vulnerable to crest recession and narrowing. Here the risk of hinterland flooding would therefore increase.</p> <p>The stretch of coast between New Works and the War Memorial will also be vulnerable to breaching during this period, although up to this point it has remained in a largely static, but over steepened state. Any sediment released as groynes fail to the east of New Works is likely to continue to be moved further eastwards and also the growth of the ebb-tidal delta will result in a diminished input from further west (due in parts to lack of sediment input around Gore Point;</p>	<p>tidal prism sufficiently to allow the breach to reseal. Conversely, an increase in sea level rise would tend to increase the tidal prism; therefore it would depend upon the balance between these two processes. There is therefore a degree of uncertainty associated with this stretch coast and that to the west.</p> <p>It is possible that breaches may occur along other sections of the barrier, particularly to the east of New Works, up to the War Memorial. Despite the increase in sediment being moved alongshore, due to failure of the groyne defences and the loss of defences at Porlock Weir during this epoch, the ebb-tidal delta at the breach could continue to act as a sink for this sediment. There is also a limited supply of sediment in the system as a whole and any sediment moved into this frontage, will continue eastwards towards Hurlstone Point. The frequency of wave overwashing events would also increase with accelerated sea level rise and this coastline would be vulnerable to any increase in storminess or change in wind-wave climate.</p> <p>Any breaches formed, due to catastrophic failure of the barrier, could remain open, but this would be governed by inlet efficiency, which may depend upon the number of breaches forming. It is not thought likely that sediment released by defences updrift failing would be a significant enough to close breaches otherwise.</p> <p>Further east, between Horner Water and</p>



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>although the effect of defences at Porlock Weir will reduce towards the end of this period). Therefore this stretch could be denuded of volume and in its over steepened state it is at greater risk of catastrophic breakdown.</p> <p>It is possible that any breaches that form could become permanent, but it has been suggested (Orford, 2003) that inlet efficiency could be reduced, should a number of breaches form, which would then limit the permanence of breaches.</p> <p>Further east, between Horner Water and Hurlstone Point, the beach is expected to remain stable and relatively static.</p>	<p>Hurlstone Point, the beach will continue to be fed by sediment being moved alongshore; therefore much of this is likely to remain stable and static. Accelerated sea level rise may, however, have an increased impact during this period and it is likely that the boulder foreshore could become less effective in terms of wave dissipation. Therefore during this period, the trend may start to change to net crest recession as the barrier starts to roll landward. The barrier, along most of its length, is likely, however, to remain robust and provide continued protection to the low-lying hinterland behind.</p>
<b>POLICY SCENARIO AREA: HURLSTONE POINT TO HINKLEY POINT</b>			
<p>This section of coastline runs from Minehead in an easterly direction for approximately 25km to Hinkley Point. There are several Conservation Areas within this stretch of coast. Dunster Castle and Daw Castle are nationally important Scheduled Monuments, and are two of many Scheduled Monuments within the area. The West Somerset Railway serves this area, following the coastline of Blue Anchor Bay for much of its length. It is in close proximity to the shoreline at Ker Moor before turning inland towards Watchet.</p> <p>Minehead is a popular holiday resort with its sandy beaches, holiday park and local attractions and is a Conservation Area. Minehead seafront forms the beginning/end of the South West Coast Path which continues along the South West Peninsula to Dorset. The coastline beyond Minehead is largely rural.</p> <p>The long-term Plan here is to continue to reduce flood and erosion risk to Minehead by maintaining the town's defences. However, to achieve this objective, the risk of 'back-door' flooding from east of Minehead, via The Warren/Dunster Beach/Ker Moor frontage on Blue Anchor Bay, needs to be addressed. The Plan is therefore to manage the realignment of this coast towards a set-back position, possibly seaward of the West Somerset Railway in order to retain this asset that is of economic importance to the wider area. This would not only address the risk of 'back-door' flooding at Minehead but it is likely that more beach would be retained at Dunster and salt marsh may also develop in front of the set-back defence. Both retention of beach material and development of salt marsh would provide additional natural defences.</p> <p>The long-term Plan for Blue Anchor is to move towards a 'No Active Intervention' policy in the long term. Maintaining defences along the present line here will become increasingly technically difficult and are also unlikely to attract public funds from the flood and coastal defence budget. This could necessitate re-routing the access to the coast road; however alternative access routes are available.</p>			

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<p>The section of the coastline between Blue Anchor and Lilstock is noted for its geology and geomorphology and is designated as a SSSI; it contains one of the thickest successions of the Jurassic period, which is probably the best in North West Europe. The Quantock Hills rise steeply from the coast and have national nature conservation and geological interest, designated as both a SSSI and SAC. The distinctive and attractive nature of the landscape is also recognised by its designation as an AONB. This part of the coast is largely rural, with the exception of Watchet. East of St Audries Bay are hamlets and farms looking out onto Bridgwater Bay. Hinkley Point at the eastern end of this stretch is the location for a Nuclear Power Station of strategic importance to the National Grid.</p> <p>The long-term Plan for the majority of this part of the coast is to allow it to evolve naturally and thus retain its important landscape character. Continuing to protect some areas may be acceptable from a coastal processes point of view but is unlikely to attract public funds from the flood and coastal defence budget. Therefore, some currently defended areas may face increased flood and erosion risk in the medium to long term as existing defences deteriorate and fail. Ways of adapting to the increased risk may be needed for these areas. The long-term Plan for Watchet is to continue to defend these areas against the risk of flooding and erosion.</p>			
7d18 – Hurlstone Point to Minehead (west)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>This section is comprised of undefended cliffs, and ends (at the eastern boundary) just to the west of Minehead, where defences in the form of buried groynes immediately west of Minehead, and a terminal groyne associated with the harbour breakwater occur.</p>	<p>No defences along this stretch, although the eastern end will be affected by continued presence of defences at Minehead in the adjacent section.</p>	<p>No defences along this stretch, although the eastern end will be affected by continued presence of defences at Minehead in the adjacent section.</p>
	<p>The heavily faulted and folded sandstones along this stretch of the coastline are predicted to experience low rates of recession as has occurred historically; therefore negligible erosion is predicted by year 20 for most of this coast. However, there is a risk of small frequent rock falls and also larger events occurring at Minehead Bluff, which locally could cause up to 10 to 50m retreat over a short section of cliff.</p> <p>The cliffs are fronted by a narrow gravel beach which is predicted to generally remain stable during this epoch, although trends of beach lowering towards the east may continue. There is</p>	<p>Low rates of erosion are expected to continue, with less than 5m erosion predicted by year 50. However, there is a risk of a large landslide at Minehead Bluff, which locally could cause up to 10 to 50m retreat over a short section of cliff.</p> <p>The cliffs are fronted by a narrow gravel beach and beach lowering towards the east may continue. There is little, if any, incoming sediment from updrift and therefore should sediment be lost it would not be expected to be replaced. This trend is predicted to be exacerbated by rising sea levels and increased storminess associated with climate change which will deplete beach</p>	<p>The cliffs along this stretch are expected to continue to slowly erode, with less than 10m expected by the end of this period. However, there is a risk of a large landslide at Minehead Bluff, which locally could cause up to 10 to 50m retreat over a short section of cliff.</p> <p>The cliffs are fronted by a narrow gravel beach which is predicted to narrow and continue lowering during this epoch. There is little, if any, incoming sediment from updrift and therefore should sediment be lost it would not be expected to be replaced. This trend is predicted to be exacerbated by rising sea levels and increased</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>little, if any, incoming sediment from updrift areas and therefore beaches rely on local sediment inputs, which are negligible due to the slow rates of cliff erosion.</p> <p>The harbour breakwater at Minehead and associated concrete groyne would continue to affect the very eastern end of this stretch, by trapping sediment and preventing it travelling further east around into Minehead Bay.</p>	<p>sediments further without any significant sources of sediment from updrift areas to replace it. The resistant cliffs mean that the beach will be unable to retreat and therefore narrowing is expected.</p> <p>The harbour breakwater at Minehead and associated concrete groyne would continue to impact upon the very eastern end of this stretch, by trapping sediment and preventing it travelling further east around into Minehead Bay. This would help provide some protection to the cliffs immediately north-west of Minehead.</p>	<p>storminess associated with climate change which will deplete beach sediments further without any significant sources of sediment from updrift areas to replace it.</p> <p>As long as it remains, the harbour breakwater at Minehead and associated concrete groyne would continue to trap sediment and prevent it travelling further east around into Minehead Bay. The wider beach that would be retained updrift of the structure would afford some protection to the cliff behind, including along the very eastern end of this stretch.</p>
<b>7d19 – Minehead</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	<p>At the western end of this stretch, there are some buried groynes immediately west of Minehead, and a terminal groyne associated with the harbour breakwater at Minehead. These structures would need to be maintained and eventually upgraded towards the end of this epoch.</p> <p>The Minehead urban area along this stretch is protected by a scheme constructed in 1997-8 consisting of new recurve seawall, rock revetments and groynes coupled with a large beach recharge. These structures will remain during this period with ongoing maintenance, including beach recycling as required to retain sufficient beach in front of the seawall.</p>	<p>The various defences and structures along this stretch, including seawall, breakwaters and groynes, will all require ongoing maintenance during this epoch.</p> <p>Continued beach recycling would form part of this maintenance.</p>	<p>The groynes to the immediate west of Minehead Harbour would likely require further upgrade during this period, although the harbour structures themselves are only likely to require ongoing maintenance.</p> <p>Along the frontage of the Minehead urban area, the various defences that includes a recurve seawall, rock revetments and groynes, may need some improvements during this period. This will be supported by ongoing beach recycling activities, which may also require additional beach recharge in this epoch.</p>
	Maintenance and upgrade of the harbour	With continued maintenance occurring, the	With continued maintenance occurring, the

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>breakwater at Minehead and associated concrete groyne during this epoch, means this feature will continue to trap sediment and prevent it travelling further east around into Minehead Bay, resulting in a localised accumulation of sediment updrift.</p> <p>As a result, there has been a lack of sediment to feed the beach to the east and there have been extensive defence works including a beach recharge. The predominately sandy beach is held in place by large rock groynes. Little change is anticipated along this shoreline during this period, as the new defence scheme will maintain beach stability.</p> <p>However, the terminal groyne at the eastern end of the bay will continue to prevent sediment leaving the scheme area (to move further east towards Dunster). This may exacerbate problems at the Warren (refer to the adjacent section) where an overall trend of shoreline retreat is predicted due to its exposure to storm wave energy. This in turn could pose a risk of outflanking and backdoor flooding from the west to this section along the Minehead frontage, until such time that this risk is reduced by construction of secondary flood defence embankments to the east of Minehead in this epoch under this scenario.</p>	<p>barrier to drift provided by the harbour structures at the western end of this stretch will continue during this epoch, with any sediment travelling from the west being trapped updrift. This would help provide some protection to the cliffs immediately north-west of Minehead.</p> <p>To the west of the harbour arm breakwater, there could also be risk of flooding in this western part of this stretch, but this would be very minor. There is not a backdoor flood route to Minehead (Black &amp; Veatch, 2006a).</p> <p>Defences along the frontage at Minehead will remain, fixing the shoreline position at this location. The groynes, whilst reducing longshore losses will not prevent offshore sediment movement and therefore during this period, under rising sea levels, there may start to be intertidal narrowing. This will put increased pressure on the defences, and beach recycling would likely be required to minimise these impacts.</p> <p>The continued presence of the terminal groyne at the eastern boundary of this stretch will prevent sediment moving down-drift, which will likely continue to exacerbate the problems at the Warren, and modifications to the terminal groyne may help reduce these impacts.</p>	<p>barrier to drift provided by the harbour structures at the western end of this stretch will continue during this epoch, with any sediment travelling from the west being trapped updrift. The wider beach that would be retained updrift of the structure would afford some protection to the cliff behind.</p> <p>To the west of the harbour arm breakwater, there could also be a risk of flooding, but this would be very minor and there is not a backdoor flood route to Minehead (Black &amp; Veatch, 2006a).</p> <p>The defences will remain along the rest of the Minehead frontage but will be increasingly exposed to wave action. There will therefore be an increased risk of overtopping and the defence heights may need to be increased (likely involving re-building defences to be larger than at present as the 1998 scheme nears the end of its effective life during this epoch). Beach recycling activities that support the retention of defences will become increasingly difficult due to coastal squeeze and ongoing offshore movement of sediment. As such, further beach recharge is likely to be required along this stretch during this epoch.</p> <p>The continued presence of the terminal groyne at the eastern boundary of this stretch will prevent sediment moving down-drift.</p>
7d20 – The	Policy = Hold the Line	Policy = Hold the Line	Policy = Managed Realignment

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<b>Warren (Minehead Golf Course)</b>	<p>There are no hard defences along this stretch of coast, although it is significantly influenced by the presence at its western end of the terminal groyne at Minehead constructed as part of the 1998 scheme.</p> <p>Currently beach recycling and reprofiling is undertaken, to limited success due to lack of sediment, to maintain a beach in front of embankments that would otherwise be eroded. Indeed, some areas of the bank have eroded in recent times due to periods of low beach levels.</p> <p>Under this policy, these beach management activities would continue in the immediate term, likely supported by re-building of the earth embankment and possibly introducing additional erosion protection measures (in line with recommendations made by Black &amp; Veatch, 2009). This will allow time for ‘Managed Realignment’ options to be fully investigated in advance of implementation during the medium term.</p> <p>However, the risk of overtopping and erosion in this area poses a significant flood risk to Minehead, and so to reduce this risk in the short term, secondary embankment defences would be constructed in land during this epoch under this scenario.</p>	<p>During this epoch, there would be continued beach management and maintenance of the embankment and secondary defence.</p> <p>If this were to become unsustainable during this period, then the policy could move towards the long-term policy of ‘Managed Realignment’. This would involve adopting the secondary defence line established in the short term, as the primary defence line in this epoch, including possibly armouring the embankment. The fronting beach and ‘currently defended area’ would then be allowed to erode and retreat back to this new defence line.</p>	<p>If still sustainable to do so, maintenance of the existing defence line would occur for as long as technically and economically possible during this period.</p> <p>If not occurred in the medium-term, it is likely that the policy will need to move to one of ‘Managed Realignment’ during this epoch. This would involve adopting the secondary defence line established in the short term, as the primary defence line in this epoch, including possibly armouring the secondary defence embankment. The fronting beach and ‘currently defended area’ would then be allowed to erode and retreat back to this new defence line.</p> <p>The realigned defence position would then be maintained to continue to reduce the risk of flooding to the wider Minehead area to the west.</p>
	<p>This is a low-lying section of the shoreline defended by an earth embankment which itself is fronted by a managed gravel and cobble ridge and</p>	<p>The maintenance of the fronting beach through beach recycling and reprofiling is likely to become increasingly difficult to achieve in the current</p>	<p>If not occurred in the medium term, then it is very likely that maintenance of the existing defence line will become unsustainable in the</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>sandy lower beach. Due to lack of sediment along this stretch, beach management activities struggle to provide an adequate fronting beach which has resulted in parts of the earth embankment defence being eroded during storm events. This embankment needs to be re-built, possibly with some local fronting measures to reduce the immediate erosion risk, in the immediate term.</p> <p>The terminal groyne at the eastern end of the bay will continue to prevent sediment reaching this stretch. This may exacerbate problems at the Warren where an overall trend of shoreline retreat is predicted due to its exposure to storm wave energy, making the long-term defence of this area technically difficult compared to a realigned defence position. This area is therefore vulnerable to overtopping and flooding.</p> <p>To ensure the risk of flooding to the wider Minehead area is minimised from any such overtopping and flooding along the Warren, construction of a secondary defence would occur in this epoch to provide additional defence inland.</p>	<p>position due to lack of sediment and rising sea levels.</p> <p>Therefore, during this epoch, these beach maintenance activities may need to cease and the existing shoreline position allowed to erode and retreat landwards, to the secondary defence line constructed in the short term. If this occurs, then as the shoreline retreats to this new position, the secondary defence will therefore become more exposed to wave and tidal action, and so the defence is likely to require armoured in this epoch as the change in policy occurs.</p> <p>The area of the Warren that would erode under this scenario is underlain by cobble/shingle deposits that would erode and so be released to the shoreline sediment transport system, which is likely to benefit downdrift beaches at Dunster and Blue Anchor. The amount of sediment that could be released is, however, uncertain, and this would need to be considered in the investigations in the short term.</p> <p>However, the realigned defence position would still retain the Warren (as an all-be-it smaller) headland that will continue to influence coastal processes in Minehead Bay to the west.</p>	<p>current position due to lack of sediment and rising sea levels.</p> <p>Therefore, during this epoch, the existing shoreline position will be allowed to erode and retreat landwards, to the secondary defence line constructed in the short term. As the shoreline retreats to this new position, the secondary defence will become more exposed to wave and tidal action, and so the defence is likely to require armoured in this epoch as the change in policy occurs.</p> <p>The area of the Warren that would erode under this scenario is underlain by cobble/shingle deposits that would erode and so be released to the shoreline sediment transport system, which is likely to benefit downdrift beaches at Dunster and Blue Anchor. The amount of sediment that could be released is, however, uncertain, and this would need to be considered in the investigations in the short term.</p> <p>However, the realigned defence position would still retain the Warren (as an all-be-it smaller) headland that will continue to influence coastal processes in Minehead Bay to the west.</p>
7d21 – Dunster Beach	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>
	Groynes are found along this stretch that encompasses Dunster Beach, which serve to	Maintenance of the groynes and beach along this stretch by private funds will be permitted,	If continued through the medium term, maintenance of the groynes and beach along this

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>protect the gravel storm ridge. These are private defences that have been constructed over a number of years, and under this scenario these would be allowed to remain and be maintained, though they may require upgrading during this epoch. These defences are also supported by beach recycling and reprofiling, in order to maintain sufficient beach along this stretch to reduce the risk of overtopping and flooding to the low-lying hinterland.</p> <p>This continued management in this epoch would be permitted to continue to occur during this epoch, allowing time for measures to be developed for relocating people and property located along this stretch in the medium to long term as this becomes technically unsustainable.</p> <p>However, whilst the shoreline defences would continue to be permitted to be retained by private funds, there is a risk that flooding in this area could cause ‘backdoor’ flooding to Minehead to the west. Public funds could be justified, under this policy, for construction of a secondary defence during this epoch to provide additional defence inland. This would be in combination with a similar defence in the adjacent sections at the Warren and Ker Moor.</p> <p>The eastern end of this unit is at the outflow of the River Advill relief channel, which appears to act as a groyne, preventing sediment reaching downdrift areas. This structure is assumed to be</p>	<p>although this could become increasingly technically difficult during this period due to reduced sediment supply from the west and rising sea levels.</p> <p>As such, measures that should be developed in the short term for the relocation of people and property along the Dunster Beach frontage, may need to be implemented during this epoch if current practices become unsustainable. As this occurs, the beach would then be allowed to roll back towards the secondary defence line established in the short term as sea levels rise. The secondary defence would therefore become the primary defence in terms of reducing risk of flooding to a wider area of low-lying hinterland, and may need to be armoured in this epoch as the defence becomes more exposed to wave and tide action.</p> <p>Adaptation of the outflow of the River Advill relief channel at the eastern end of this stretch may also need to be considered.</p>	<p>stretch by private funds will be permitted, although this is very likely to become increasingly technically difficult during this period due to reduced sediment supply from the west and rising sea levels.</p> <p>As such, maintenance of the existing shoreline defence would cease and the beach would then be allowed to roll back towards the secondary defence line established in the short term as sea levels rise. The secondary defence would therefore become the primary defence in terms of reducing risk of flooding to a wider area of low-lying hinterland, and may need to be armoured in this epoch as the defence becomes more exposed to wave and tide action.</p> <p>Adaptation of the outflow of the River Advill relief channel at the eastern end of this stretch may also need to be considered.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	maintained during this epoch.		
	<p>This is a low-lying section of the shoreline fronted by a gravel and cobble ridge and sandy lower beach. Along this stretch the shingle beach forms the main defence, and along much of its length is also protected by groynes.</p> <p>The gravel storm ridge along Dunster Beach has been eroded, due to the net eastward movement of shingle, but little input from further west, although beach recycling and construction of groynes by private funds along this stretch has served to maintain more beach material than would have remained otherwise. Where groynes have been constructed the beach has remained fairly stable and this trend is expected to continue during this period. It is not thought that this work at Dunster Beach has had a significant impact upon down drift beaches.</p> <p>However, this section remains susceptible to overtopping that could cause flooding of Minehead via the ‘backdoor’. This risk would be reduced by a secondary defence line constructed in this period,</p>	<p>If maintained by private funds, the groynes at Dunster may help to stabilise the beach locally by restricting longshore drift, but offshore losses may continue, resulting in beach retreat here, as a result of sea level rise.</p> <p>With roll back and narrowing of the ridge occurring, the effectiveness of groynes will reduce and there will therefore be an increased risk of breaching and flooding of the hinterland. Maintenance of the secondary defence position (established in the short term) in this epoch will continue provide a more sustainable defence alignment for reducing flood risk to the wider area of low-lying hinterland.</p> <p>Depending on when the move to ‘Managed Realignment’ occurs in Policy Unit 7d20, the effect of beach roll back and narrowing may be mitigated to some degree by release of (an uncertain amount of) sediment from erosion of the Warren that could potentially occur during this epoch if ‘Managed Realignment’ is implemented in this epoch along the Warren.</p>	<p>Continued shoreline retreat is predicted across this frontage, even if defences continue to be maintained by private funds. This is very likely to make continued defence along existing alignments unsustainable in this epoch.</p> <p>Therefore, and if not occurred in the medium-term, maintenance of the existing defence line will cease and the beach will be allowed to erode and retreat landwards, to the secondary defence line constructed in the short term. As the shoreline retreats to this new position, the secondary defence will become more exposed to wave and tidal action, and so the defence is likely to require armouring in this epoch as the change in policy occurs.</p> <p>Along this stretch there will be an increased risk of overtopping and breaching, although large-scale flooding will be constrained by continued maintenance of the realigned defence position.</p> <p>The effect of beach roll back and narrowing may be mitigated to some degree by release of (an uncertain amount of) sediment from erosion of the Warren that could occur during this epoch as ‘Managed Realignment’ is implemented in this epoch along the Warren.</p>
7d22 – Dunster Beach (east) to	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	This area that forms the central part of Blue	Under this scenario, the realigned defence	Under this scenario, the realigned defence



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
<b>Ker Moor</b>	<p>Anchor Bay, is undefended in terms of hard defence structures, although some flood protection is afforded by the fronting gravel and cobble ridge, which will be allowed to evolve naturally under this scenario.</p> <p>In order to reduce the risk of flooding to the wider area of low-lying hinterland (that is posed by the risk of overtopping and breaching of the fronting beach along this stretch), a secondary defence embankment would be constructed in this epoch. This would be in support of similar secondary defences that would be constructed along the adjacent sections to the west.</p> <p>Assuming that the West Somerset Railway Line is to be defended along its length under this scenario, then a possible secondary defence alignment could be seaward of the railway line.</p>	<p>position established in the short term would be maintained. As the fronting beach rolls back towards this position, it may become necessary to armour the embankment defence as it becomes more exposed to wave and tide action.</p>	<p>position established in the short term would continue to be maintained. As the fronting beach rolls back towards this position, and if not already occurred in the medium term, it may become necessary to armour the embankment defence as it becomes more exposed to wave and tide action.</p>
	<p>This is a low-lying section of the shoreline fronted by a gravel and cobble ridge and sandy lower beach.</p> <p>Whilst Blue Anchor Bay as a whole has remained quite stable historically, the gravel storm ridge has been eroded, particularly along this stretch towards Dunster Beach, due to the net eastward movement of shingle, but little input from further west. Net retreat is likely to continue at rate of around 0.6m/year (Black &amp; Veatch, 2006a), with roll back and narrowing of the ridge.</p> <p>This roll back of the beach could potentially cause</p>	<p>Along this undefended stretch, erosion will continue, with roll back and narrowing of the ridge. There will therefore be an increased risk of breaching and flooding of the hinterland, although this would be minimised by the presence of the secondary defence, constructed in the short term and maintained during this epoch.</p> <p>The realigned defence position along this stretch will become increasingly exposed to wave and tide action as erosion occurs at rates of around 0.6m/year or more. Therefore defences will need to be armoured during this epoch in order to</p>	<p>Continued shoreline retreat is predicted across the undefended frontage, with an associated increase in the risk of overtopping and breaching. However, large-scale flooding of the hinterland will continue to be reduced by maintenance of the realigned defence position during this epoch.</p> <p>Maintenance of the realigned defences at the eastern end of Ker Moor, adjacent to the defences at Blue Anchor, would also serve to reduce the risk of outflanking to Blue Anchor itself.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
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	outflanking of defences at Blue Anchor to the east, and also result in increased risk of overtopping and breaching causing wide-spread flooding to the low-lying hinterland. As such, construction of a secondary defence line in this epoch would reduce both these risks, and be supportive of the policies along the adjacent sections of coast to both the east and west.	provide adequate levels or protection into the long term.	
<b>7d23 – Blue Anchor</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = No Active Intervention</b>
	Along this stretch at the eastern end of Blue Anchor Bay, there is a scheme involving a concrete seawall and timber groynes, with the wall reinforced by a rock revetment and T-head rock groynes in the east. These defences will for the most part require ongoing maintenance during this period, although at the very eastern end, where defences are older (having not been upgraded as part of the recent scheme to protect the road at Blue Anchor), new defences will need to be constructed in the immediate term, extending a short way further east than present, in order to reduce the risk of outflanking to the new defences to the immediate west and also reduce the risk of the road being affected by erosion.	The various defences along the frontage at Blue anchor would require ongoing maintenance during this epoch.  During this epoch, in advance of the transition to the long-term policy of ‘No Active Intervention’, measures would need to be developed to allow for the relocation of people and property that will be required when this policy change happens.	During this epoch, as the various defences reach the end of their effective life, they would not be replaced with larger, more expensive defences (that would be required to deal with the effects of sea level rise and greater wave action), and there would be a move towards ‘No Active Intervention’ under this scenario, with maintenance of the defences ending. As such, measures to relocate people and property, developed in the medium term, would need to be implemented at this time.  Even without maintenance however, the defences would remain an influence on coastal evolution for some time to come, as they will gradually deteriorate and fail (i.e. they will not fall down straight away once maintenance stops).  Depending upon whether or not the West Somerset Railway has been defended by policies further to the west, there may need to be some localised managed realignment at the western end

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
			of this section to protect the railway line as it turns in-land.
	<p>The defences at Blue Anchor will prevent roll back of the beach, and thus beach narrowing is expected.</p> <p>The risk of outflanking of these defences by erosion of the adjacent soft cliffs to the immediate east of the older defences at Blue Anchor, would need to be addressed in this epoch. Under this scenario, a rock revetment type defence would be constructed to replace the old seawall defences. In order to be effective and reduce both risk of outflanking, and reduce the risk of erosion causing loss of the road as it drops down to the sea front at Blue Anchor, the replacement defences are likely to need to extend a short distance eastwards, along the front of part of the adjacent, currently undefended cliff.</p>	<p>The defences at Blue Anchor Bay will continue to fix the shoreline position and prevent roll back of the beach, and thus beach lowering may be expected. This section of shoreline will become increasingly exposed as adjacent undefended stretches continue to erode at rates of around 0.6m/year or more. This risk at the western end will however, be reduced by the policy at Ker Moor under this scenario, which would involve holding a realigned defence position seawards of the West Somerset Railway line.</p> <p>At the eastern end of this section, the risk of outflanking caused by erosion of the adjacent cliffs will also be a concern, depending upon the actual rate of erosion that occurs. There may therefore be a need to bolster the rock revetment defence (constructed in the short term) at the eastern end of this stretch during this epoch to manage this risk.</p>	<p>At Blue Anchor defences will continue to fix the shoreline position, which will stand several metres seaward of the adjacent shorelines by this period. These defences will continue to reduce the risk of flooding, but would require upgrading, due to increased exposure. There would also be a high risk of outflanking at the eastern end unless works are undertaken to address this.</p> <p>It is unlikely that replacement of defences along this section, which will require much larger and more expensive defences, and so maintenance would be withdrawn and defences allowed to gradually deteriorate and eventually fail. This will result in localised cliff recession on the eastern side of Blue Anchor at an accelerated rate for an initial period of time before returning to a more natural rate of recession in line with the cliffs in the adjacent undefended coast.</p> <p>Therefore the risk of overtopping, flooding and erosion would increase towards the end of this epoch, and measures to adapt to this will need to be implemented.</p>
7d24 – Blue Anchor to Watchet	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section encompasses the undefended cliffs from Blue Anchor to Watchet up to the western extent of defences at Watchet.	No defences.	No defences.

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>This frontage mostly comprises Triassic shale and limestone and Jurassic mudstone cliffs fronted by intertidal rock platforms, intersected by small embayments.</p> <p>To the east of Blue Anchor Bay, sandstone cliffs are replaced by mudstones cliffs, which erode via cliff falls, landslips and rotational slides. Such events have resulted in several metres of erosion in the recent past. Up to 2 to 10m of recession may occur along this undefended stretch of coast by year 20, although there is a risk that a single event could cause up to 10 to 50m erosion at a single location.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. This erosion will result in some widening of the rock shore platforms; these rock platforms are predicted to continue providing defence to the foreshore.</p>	<p>The mudstone cliffs erode via cliff falls, landslips and rotational slides, which have resulted in significant amounts of erosion at certain locations in the recent past. Along much of the undefended frontage, between 5 and 25m of recession may occur, but a landslide event at any one location could cause up to 10 to 50m of erosion.</p> <p>Differential cliff erosion to the varying geology and continued impact of defences will result in more pronounced embayments forming along this coastline, with the resistant limestone areas and defended stretches forming headlands.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. However, the individual embayments act as semi-closed systems and therefore transport around the headlands is likely to be limited and on a periodic basis.</p> <p>Although the rock platforms are predicted to continue providing defence to the foreshore, sea level rise may reduce their defence role and therefore the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>	<p>Differential erosion of this cliffed frontage will continue, although rates may increase due to sea level rise. Failure will be through both gradual erosion and larger landslide events. Along much of the frontage between 10 and 50m of erosion may be expected, however there is a risk that any one location a larger event could cause up to 50m of erosion.</p> <p>Ultimately the coastline will become defined by a series of crenulated bays, formed between the more resistant limestone outcrops, which will emerge as headlands. In the long term, the bay could reach a more stable form, resulting in lower rates of erosion; however this process may be prevented by the predicted acceleration in sea level rise. Rates of cliff erosion will vary across this frontage, with little or no erosion being experienced in some places, but potentially up to 100m in other locations.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. However, as the crenulated bays develop, sediment transport may reduce.</p> <p>Sea level rise and increased storminess as a result of climate change are predicted to reduce the defence role of the rocky intertidal platform, and thus the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>
7d25 – Watchet	Policy = Hold the Line	Policy = Hold the Line	Policy = Hold the Line

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
to Doniford	<p>Watchet is protected by concrete seawalls, and rock groynes and revetments in the harbour area and some of these defences will require upgrading towards the end of this epoch with much larger structures, such that they are able to provide adequate levels of protection in the long term.</p> <p>Between Watchet and the western half of Doniford Bay (fronting the railway line) there are localised stretches of rock revetment defences and small groynes (between short lengths of undefended cliffs) protecting the low-lying land and part of the West Somerset Railway. These presently do not provide a coherent defence against the risk of erosion.</p> <p>These defences would likely need to be upgraded with larger more coherent defences along the length of this part of the frontage in order to continue to provide adequate levels of protection to the railway line, in support of policies along adjacent sections of coast which also seek to protect the railway line along its length under this scenario.</p>	<p>Watchet is protected by concrete seawalls, and rock groynes and revetments in the harbour area. Some of these defences will require ongoing maintenance during this epoch, whilst others will need to be upgraded with much larger structures, such that they are able to provide adequate levels of protection in the long term.</p> <p>The defences between Watchet and the western half of Doniford Bay, having been upgraded in the short term, will require ongoing maintenance during this epoch in order to ensure that adequate levels of protection to the railway are provided.</p>	<p>The various defences along this stretch will require ongoing maintenance during this epoch to ensure that they continue to provide adequate levels of protection.</p> <p>At the western and eastern ends, however, there will be an increasing risk of outflanking due to erosion of adjacent, undefended cliffs, and so measures to bolster these areas between defended and undefended parts of the coast may be required in this period to address this risk.</p>
	<p>This frontage mostly comprises Triassic shale and limestone and Jurassic mudstone cliffs fronted by intertidal rock platforms, but which are protected against erosion along much of this section by the presence of a range of defences along the cliff toe.</p> <p>The defences at Watchet currently fix the shoreline position and therefore there will be no</p>	<p>At Watchet, the shoreline position has historically remained fixed by defences, including the harbour structures. This localised effect is predicted to continue, with the cliffs thus prevented from eroding and adding sediment to the system.</p> <p>To the east, a crenulated-form embayment is forming in the lee of the limestone outcrop at</p>	<p>At Watchet, the shoreline position has historically remained fixed by defences, including the harbour structures. This localised effect is predicted to continue, with the cliffs thus prevented from eroding and adding sediment to the system.</p> <p>Defences between Watchet and Doniford will continue to reduce erosion and so impact upon</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>change along this frontage during this period. These defences will continue to minimise the risk of flooding and erosion, although this is only a localised effect.</p> <p>To the east, the defences between Watchet and Doniford will continue to help slow cliff erosion along this stretch, but there may be issues of outflanking to either side of the defences. Replacement of defences along this stretch with a more coherent defence will reduce this outflanking risk and continue to afford both erosion and flood protection to the low cliffed areas.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. This erosion will result in some widening of the rock shore platforms; these rock platforms are predicted to continue providing defence to the foreshore. However, if replacement defences extend along these undefended areas, then this sediment supply would reduce.</p>	<p>Helwell Bay. Defences, in the form of groynes and rock revetment, which will be replaced with larger (and likely more extensive) defences in the short term prevent cliff erosion here. However, the here beach is narrower than to the east and the cliffs are much lower, therefore there could be an increased risk of both flooding, due to overtopping, and erosion during this period.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east, although due to the defences there are not predicted to be significant impacts.</p> <p>Although the rock platforms are predicted to continue providing defence to the foreshore, sea level rise may reduce their defence role and therefore the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>	<p>sediment supply, especially if the extent of defences is increased in the short term. The beach fronting these defences is therefore predicted to narrow further, and could even become permanently submerged as sea levels rise during this epoch.</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. However, as the crenulated bays develop, sediment transport may reduce.</p> <p>Although the rock platforms are predicted to continue providing defence to the foreshore, sea level rise may reduce their defence role and therefore the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>
7d26 – Doniford to St Audries Bay	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>Much of this stretch is comprised of undefended cliffs. However, along part of this section, the cliff toe in front of Doniford Holiday Park is protected by a rock revetment.</p> <p>This is privately owned defence and it is unlikely public funds would be attracted to maintain or</p>	<p>The defences along this stretch could be maintained if private funds are available to achieve this. However, it may become technically and economically unviable to do so, particularly if the adjacent undefended cliffs retreat and pose a significant outflanking risk.</p> <p>If this is the case, and no maintenance of the</p>	<p>The defences along this stretch could be maintained if private funds are available to achieve this. However, if not already occurred in the medium term, it may become technically and economically unviable to do so, particularly if the adjacent undefended cliffs retreat and pose a significant outflanking risk.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>replace them.</p> <p>To retain defences here would also likely exacerbate coastal squeeze (narrowing of the shoreline), resulting in narrowing or even loss of the fronting beach. There is also a potential risk of outflanking by erosion of undefended cliffs on either side creating a promontory along this frontage that interrupts sediment transport to the down-drift coast.</p> <p>Defences could be maintained during this period, if private funds are available to achieve this. However, if this is not the case then measures will need to be adapted in this period to plan the adaptation of this frontage in the medium to long term once the defences reach the end of their effective life.</p>	<p>defences occurs, then the defences would deteriorate and fail during this period.</p> <p>As such, assets at Doniford Holiday Park would be at increased risk of flooding and erosion, and adaptation measures may be needed to address this during this period.</p>	<p>If defences have not been maintained in the previous epochs, then there would be no defences along this section during this period. The coast would therefore continue to evolve naturally.</p>
	<p>This frontage mostly comprises Triassic shale and limestone and Jurassic mudstone cliffs fronted by intertidal rock platforms, defended in parts by rock revetment at the cliff toe that serves to prevent erosion locally.</p> <p>These cliffs erode via cliff falls, landslips and rotational slides. Such events have resulted in several metres of erosion in the recent past. Up to 2 to 10m of recession may occur along this undefended stretch of coast by year 20 although there is a risk that a single event could cause up to 10 to 50m erosion at a single location.</p> <p>The maintenance of the rock revetment in front</p>	<p>The mudstone cliffs erode via cliff falls, landslips and rotational slides, which have resulted in significant amounts of erosion at certain locations in the recent past. Where cliffs remain undefended along parts of this frontage, between 5 and 25m of recession may occur, but a landslide event at any one location could cause up to 10 to 50m of erosion.</p> <p>Continued defence at Doniford Holiday Park, if funds are available for this purpose, would prevent erosion locally during this epoch, with the cliffs thus prevented from eroding and adding sediment to the system.</p>	<p>Where cliffs remain undefended along parts of this section of coast, erosion will continue, although rates may increase due to sea level rise. Failure will be through both gradual erosion and larger landslide events. Along much of the frontage between 10 and 50m of erosion may be expected, however there is a risk that at any one location a larger event could cause up to 50m of erosion.</p> <p>Continued defence at Doniford Holiday Park, if funds are available for this purpose, would prevent erosion locally during this epoch, with the cliffs thus prevented from eroding and adding</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>of the Doniford Holiday Park, if funds are available for this purpose, would continue to afford both erosion and flood protection to the low cliffed areas during this period, but there may be issues of outflanking to either side of the defences (unless defences are extended in length when they are replaced).</p> <p>Any cliff erosion that does occur will provide sediment to feed the beach downdrift, i.e. to the east. This erosion will result in some widening of the rock shore platforms; these rock platforms are predicted to continue providing defence to the foreshore.</p> <p>The Swill and its associated pipeline appears to disrupt along shoreline sediment transport, resulting in a localised build up of beach to the west of the outlet.</p>	<p>If defences are not maintained, then this effect would reduce towards the end of this period as the defences deteriorate and begin to fail due to a lack of maintenance.</p> <p>Due to rising sea levels, the beach fronting this area will narrow during this period; although increased erosion once defences fail (if they are not maintained) could reduce this effect. Any cliff erosion that does occur will also provide sediment to feed the beach downdrift.</p> <p>The Swill and its associated pipeline appears to disrupt longshore sediment transport, resulting in a localised build up of beach to the west of the outlet.</p> <p>Although the rock platforms are predicted to continue providing defence to the foreshore, sea level rise may reduce their defence role and therefore the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>	<p>sediment to the system.</p> <p>If defences have not been maintained in the previous epochs, the removal of defences at Doniford Holiday Park by this period will allow cliffs to erode and add sediment to the system.</p> <p>Due to rising sea levels, the beach fronting this section could narrow further, and could even become permanently submerged in places; this effect could be reduced by erosion of the cliffs but will depend upon the rate of erosion compared to the rate of sea level rise.</p> <p>Any cliff erosion that does occur will also provide sediment to feed the beach downdrift. The Swill and its associated pipeline acts to disrupt longshore sediment transport, resulting in a localised build up of beach to the west of the outlet.</p> <p>Although the rock platforms are predicted to continue providing defence to the foreshore, sea level rise may reduce their defence role and therefore the cliff erosion rates are likely to increase. Sediment transport rates may also be affected.</p>
7d27 – St Audries Bay	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this stretch of cliffed coastline.	No defences	No defences.
	This mainly cliffed stretch of coastline is cut into Triassic shales and limestones which have	The cliffs will continue to erode quite slowly, with up to 5 to 25m by the end of this period. There	There will be continued, slow erosion of the cliffs, with up to 10 to 50m possible by year 100. Small



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>historically eroded slowly due to their resistant nature. Future rates are predicted to be similar to these historical ones with up to 2 to 10m of erosion possible by year 20. There is a risk of localised erosion events could result in up to 10m erosion at a single location. This will be a continuation of past trends, which has resulted in a series of small indents along this shoreline.</p> <p>Any sediment eroded from the cliffs will provide material to the foreshore and the extensive rock platforms will continue to afford some protection to the cliffs. There is potential for this sediment to be transported eastwards, towards Hinkley Point., but it is periodically interrupted by small headlands.</p>	<p>is, however, a risk of localised erosion events which may cause several metres of erosion over a very localised stretch.</p> <p>Even under a scenario of sea level rise, the extensive rock platform will continue to afford some protection to the backing cliffs.</p> <p>Any sediment eroding from the cliffs will provide material to the foreshore, which may be sufficient to enable a beach to be retained at the toe of the cliffs. Sediment will also be moved eastwards along the coast.</p>	<p>erosion events will reinforce the naturally indented nature of this coastline.</p> <p>Under a scenario of sea level rise, the shore platforms may become partially submerged, but are likely to still play a role in affording some protection to the backing cliffs and beaches.</p> <p>The beach currently provides protection to the cliffs in the form of the wide intertidal rock platforms, and these are predicted to continue doing so during this epoch. The intertidal foreshore is predicted to remain stable as the sediment entering the system from cliff erosion counteracts shoreline retreat as a result of sea level rise.</p> <p>Narrow beaches are expected to be retained, particularly within the small bays formed as the cliffs erode. There is still likely to remain a sediment pathway eastwards towards Hinkley Point, but the interconnectivity of this coast may periodically reduce due to the emergence of headlands further to the east.</p>
7d28 – St Audries Bay to Lilstock	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	There are no defences along this section of coast.	No defences.	No defences.
	This mainly cliffed stretch of coastline is cut into Triassic shales and limestones which have historically eroded slowly due to their resistant nature. Future rates are predicted to be similar to these historical ones with up to 2 to 10m of	The cliffs will continue to erode quite slowly, with up to 5 to 25m by the end of this period. There is, however, a risk of localised erosion events which may cause several metres of erosion over a very localised stretch.	There will be continued, slow erosion of the cliffs, with up to 10 to 50m possible by year 100. Small erosion events will result in small bays being cut, reinforcing the naturally indented nature of this coastline.

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>erosion possible by year 20. There is a risk of localised erosion events could result in up to 10m erosion at a single location. This will be a continuation of past trends, which has resulted in a series of small indents along this shoreline.</p> <p>Any sediment eroded from the cliffs will provide material to the foreshore and the extensive rock platforms will continue to afford some protection to the cliffs. There is potential for this sediment to be transported eastwards, towards Hinkley Point, but it is periodically interrupted by small headlands.</p>	<p>Even under a scenario of sea level rise, the extensive rock platform will continue to afford some protection to the backing cliffs.</p> <p>Any sediment eroding from the cliffs will provide material to the foreshore, which may be sufficient to enable a beach to be retained at the toe of the cliffs. Sediment will also be moved eastwards along the coast.</p> <p>The small area of low-lying land at Kilve Point is also at risk from flooding during this period as the natural gravel ridge will become more vulnerable to overtopping as a result of sea level rise. The potential for barrier roll back is very limited as the coast is backed by rising topography.</p>	<p>Under a scenario of sea level rise, the shore platforms may become partially submerged, but are likely to still play a role in affording some protection to the backing cliffs and beaches.</p> <p>The beach currently provides protection to the cliffs in the form of the wide intertidal rock platforms, and these are predicted to continue doing so during this epoch. The intertidal foreshore is predicted to remain stable as the sediment entering the system from cliff erosion counteracts shoreline retreat as a result of sea level rise.</p> <p>Narrow beaches are expected to be retained, particularly within the small bays formed as the cliffs erode. There is still likely to remain a sediment pathway eastwards towards Hinkley Point, but the interconnectivity of this coast may periodically reduce due to the emergence of headlands.</p> <p>The risk of very localised overtopping and flooding at Kilve Point will increase due to rising sea levels and the risk of the barrier becoming breached. Hinterland flooding will, however, be restricted due to the local topography. There is limited opportunity along this coastline for barrier roll-back, therefore there is likely to be barrier narrowing.</p>
7d29 – Lilstock	Policy = Hold the Line	Policy = No Active Intervention	Policy = No Active Intervention

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>This short section of coast at Lilstock is defended along its length by a combination of earth embankment fronted, in its western part, by rock armour.</p> <p>These defences would be maintained to a minimum standard during this epoch to ensure they continued to function whilst measures are developed to manage the transition in policy to one of 'No Active Intervention' in the medium and long term.</p> <p>Even with maintenance, these defences are predicted to fail during the latter part of this epoch.</p>	<p>Any residual effects of defences at Lilstock will disappear in the first part of this epoch, after which time the coast will return to a fully natural state.</p>	<p>No defences.</p>
	<p>The short stretch of rock armour and earth embankment at Lilstock will continue to reduce the risk of flooding and erosion along this lower-lying section of coast, but there will be a risk of outflanking due to continued cliff erosion either side.</p> <p>Even with maintenance, the defences will deteriorate and fail by the end of this epoch, and so the risk of flooding and erosion will increase.</p>	<p>The previously protected coastline at Lilstock is at risk from overtopping and flooding, although this risk will only be localised due to the hinterland topography. The potential for barrier roll back as sea levels rise is very limited as the coast is backed by rising topography.</p>	<p>The risk of very localised overtopping and flooding at Lilstock will increase due to rising sea levels and the risk of the barrier becoming breached. Hinterland flooding will, however, be restricted due to the local topography. There is limited opportunity along this coastline for barrier roll-back, therefore there is likely to be barrier narrowing.</p>
7d30 – Lilstock to Hinkley Point	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This is an undefended section of coast.	No defences.	No defences.
	This mainly cliffed stretch of coastline is cut into Triassic shales and limestones which have historically eroded slowly due to their resistant	The cliffs will continue to erode quite slowly, with up to 5 to 25m by the end of this period. There is, however, a risk of localised erosion events	There will be continued, slow erosion of the cliffs, with up to 10 to 50m possible by year 100. Small erosion events will result in small bays being cut,

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>nature. Future rates are predicted to be similar to these historical ones with up to 2 to 10m of erosion possible by year 20. There is a risk of localised erosion events could result in up to 10m erosion at a single location. This will be a continuation of past trends, which has resulted in a series of small indents along this shoreline.</p> <p>Any sediment eroded from the cliffs will provide material to the foreshore and the extensive rock platforms will continue to afford some protection to the cliffs. There is potential for this sediment to be transported eastwards, towards Hinkley Point., but it is periodically interrupted by small headlands.</p>	<p>which may cause several metres of erosion over a very localised stretch.</p> <p>Even under a scenario of sea level rise, the extensive rock platform will continue to afford some protection to the backing cliffs.</p> <p>Any sediment eroding from the cliffs will provide material to the foreshore, which may be sufficient to enable a beach to be retained at the toe of the cliffs. Sediment will also be moved eastwards along the coast.</p>	<p>reinforcing the naturally indented nature of this coastline.</p> <p>Under a scenario of sea level rise, the shore platforms may become partially submerged, but are likely to still play a role in affording some protection to the backing cliffs and beaches.</p> <p>The beach currently provides protection to the cliffs in the form of the wide intertidal rock platforms, and these are predicted to continue doing so during this epoch. The intertidal foreshore is predicted to remain stable as the sediment entering the system from cliff erosion counteracts shoreline retreat as a result of sea level rise.</p> <p>Narrow beaches are expected to be retained, particularly within the small bays formed as the cliffs erode. There is still likely to remain a sediment pathway eastwards towards Hinkley Point, but the interconnectivity of this coast may periodically reduce due to the emergence of headlands.</p>
<b>POLICY SCENARIO AREA: HINKLEY POINT TO BREAN DOWN</b>			
<p>This section stretches from Hinkley Point to Brean Down, and encompasses the Parrett Estuary which drains into Bridgwater Bay. The River Brue discharges into the Parrett Estuary, as does the Huntspill River, via a sluice control structure to control flood risk upstream. This section of coast fronts the extensive low lying area of the Somerset and Bleadon Levels and will become increasingly susceptible to flooding as sea levels rise.</p> <p>The southern shore of this section is rural, with a couple of hamlets at Stolford and Steart, whilst the eastern shore comprises the coastal towns of Burnham-on-Sea and Highbridge. Other settlements along the banks of the Parrett Estuary include Comwich, Dunball Wharf and Bridgwater. The section of coast between Burnham-on-Sea and Brean Down represent the eastern and northern limits of Bridgwater Bay. This section of coast fronts the extensive low lying area of the Somerset and Bleadon Levels and will become increasingly susceptible to flooding as sea levels rise. At the southern end of this section is the coastal town of Burnham-on-Sea, beyond which are sand dunes at</p>			

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>Berrow and Brean, with the popular holiday park at Brean. The sandy beaches located along this frontage are important in attracting tourists to this area and are therefore crucial to the future of Burnham-on-Sea as a tourist destination as well the holiday parks, caravan and camping sites at Brean and Berrow.</p> <p>Bridgwater Bay is ecologically important for its succession of intertidal habitats and contains two national and three international designations; Bridgwater Bay SSSI and National Nature Reserve; and, Severn Estuary SSSI, Special Protection Area, Special Area of Conservation and Ramsar site. This interest is because Bridgwater Bay forms part of the wider Severn Estuary which is of international importance for its wetlands, waders and waterfowl. Inland, the River Parrett meanders between the Steart and Berrow flats. The Berrow Dunes are of national conservation importance and designated as a SSSI. The Huntspill River is a man-made channel joining the Parrett Estuary to the Somerset Levels and Moors SSSI and SPA; providing an important wildlife corridor for migrating waterfowl and waders and is designated as a National Nature Reserve.</p> <p>There are two Conservation Areas within this section of coast at Bridgwater and Burnham-on-Sea, but no landscape designations. There are also several Scheduled Monuments, including Brean Down headland and Brent Knoll as well as numerous archaeological sites within the Parrett Estuary. The Parrett Trail follows the western bank of the River Parrett inland towards Bridgwater. There are sandy beaches in front of the Steart Peninsula and on the eastern side of the Bay, where they are an important attraction of the resort town of Burnham-on-Sea.</p> <p>The long-term Plan for the Parrett Estuary is to provide sustainable flood defence to people, property and infrastructure, while allowing the estuary to evolve as naturally as possible in response to climate change and rising sea levels. There are many areas in the outer Parrett Estuary where continued provision of defences along existing alignments is unlikely to attract funding in the long term, as larger and more expensive defences would be required in order to sustain the flood risk. These areas, for example Pawlett Ham, also offer opportunities for 'managed realignment', which would involve construction and maintenance of more sustainable defences and could also offer habitat gains. However, in places such as at Steart it will not be economically viable to provide continued defence even in a realigned position.</p> <p>There are potential implications of realignment in one or more parts of the Parrett Estuary in conjunction with a No Active Intervention policy for the Steart Peninsula, both on the open coast and in upstream areas such as Bridgwater. Any potential increase in flood risk to the upper Parrett Estuary at Bridgwater and Dunball could be minimised through constructing a surge barrier, as already identified as being required to address future sea level rise in the Parrett Estuary Flood Risk Management Strategy (Environment Agency, 2009). Implementation of a surge barrier would be subject to more detailed appraisal of both technical aspects and environmental impacts.</p> <p>Towards the open coast, changes to the estuary regime could alter the low water channel, and this also needs detailed consideration. Impacts of any such changes would be managed at Burnham-on-Sea and Highbridge by retaining defences through ongoing maintenance and eventually replacing these with larger structures as the existing structures reach the end of their effective life.</p> <p>Along the coast between Burnham-on-Sea and Brean Down, the long-term Plan is to continue to provide reduce flood risk to the Somerset Levels and Moors, in a sustainable way, while maintaining the natural character and beaches along much of this frontage, which are important in attracting visitors and in terms of the regional economy. The most sustainable way to achieve this is to appropriately manage the well-established natural dune systems such as those at Berrow.</p> <p>Where dunes have been degraded by development or eroded through recreation, for example at Brean, the objective will be to encourage re-establishment of the dunes to provide protection. To achieve this, some properties at Brean built on the dunes could potentially have to be relocated, though this would be subject to more detailed study and based ongoing monitoring. In the long term, if dunes become so narrow that they become at risk from breaching, resulting in widespread flooding of the Somerset Levels and Moors, then set-back defences would be needed landwards of the dunes to minimise this flood risk. The location of any set back defences would need to be determined by</p>		

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<p>more detailed study prior to implementation.</p> <p>Between Brean and Brean Down (and along the west bank of the River Axe), the long-term Plan for Managed Realignment, in line with realignment of the adjacent coast between Berrow and Brean, could result in the mouth of the River Axe move to the south of Brean Down. The risk of flooding to the wider Somerset Levels and Moors as a result of this policy change would need to be managed through constructing set-back defences.</p>			
7d31 – Hinkley Point	<p><b>Policy = Hold the Line / No Active Intervention</b></p> <p>Defences protecting Hinkley Point power stations are in the form of a recurved seawall backed by gabion baskets, which would continue to be maintained during this period.</p> <p>These defences may also need to be extended about 1km westwards as part of the Hinkley Point expansion. Current proposals envisage construction of defences along the line of the existing shoreline to the west of the existing site.</p> <p>If extension of defences west of the current defences is not needed as part of the expansion of the nuclear power station, then currently undefended coast will be allowed to continue to evolve naturally under a policy of No Active Intervention.</p>	<p><b>Policy = Hold the Line / No Active Intervention</b></p> <p>Defences at Hinkley Point will need ongoing maintenance during this epoch.</p>	<p><b>Policy = Hold the Line / No Active Intervention</b></p> <p>Defences at Hinkley Point will need ongoing maintenance during this epoch.</p>
	<p>The existing defences will continue to protect the power station site from flooding and erosion (due to overtopping). The shoreline position will therefore remain fixed during this epoch. This will also be the case to the west of the existing site, if defences are constructed along this stretch as part of the planned expansion of the power station.</p>	<p>The defences will continue to fix the shoreline position and minimise the risk of flooding and erosion. As the undefended cliffs to the west erode (i.e. to the west of the potentially extended defences), there could be an increasing risk of outflanking to the west of the site; therefore works could be required to address this. The site will also become increasingly exposed; therefore the risk of overtopping could increase</p>	<p>The defences will continue to fix the shoreline position, but there would be an increasing risk of outflanking due to continued erosion of the undefended cliffs to the west. As sea levels rise the fronting platforms could become increasingly submerged and eroded; thereby increasing the wave energy at the toe of the defences.</p>

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	<p>The shoreline at this point protrudes seawards by about 100m, due to the power station being constructed on made ground within the foreshore zone. This situation would remain if the planned extension westwards of defences is envisaged to occur along the line of the present shoreline (i.e. not involving significant land reclamation).</p> <p>The increased exposure of this shoreline means that shingle beaches are not present at the toe of the defence: waves are able to reach the structure at high water. The extension of defences westwards would result in the eventual loss of beach in this area as well.</p> <p>The defences also act to interrupt the transport of shingle westwards along this frontage and historically the gravel ridges downdrift have been eroding. This trend is predicted to continue during this epoch.</p>	<p>(particularly along the eastern part of this frontage where the defences are older), unless defences are improved to address this.</p> <p>As well as preventing the input of sediment from the erosion of these cliffs, as the promontory increases, any sediment travelling east will become trapped and unable to continue eastwards towards Stolford. The beach fronting the westward extension of the defences would also narrow and likely become submerged by the end of this epoch.</p>	
<b>7d32 – Hinkley Point to Stolford</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>Along this stretch between Hinkley Point and Stolford, defence is provided by a rock revetment fronting earth embankment.</p> <p>These defences will require ongoing maintenance during this epoch to continue to reduce the risk of flooding to the low-lying hinterland. This will allow measures to be developed to plan and implement the medium term policy of 'Managed</p>	<p>As the existing defences reach the end of their effective life during the early part of this period, defences would be re-built in a realigned (landward) position to maintain an adequate level of protection against the risk of flooding.</p>	<p>The realigned defences will require ongoing maintenance during this epoch to ensure that they continue to maintain an adequate level of protection.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	Realignment’.		
	<p>Along this stretch to the east of Hinkley Point, the hinterland becomes low-lying, forming the start of the Steart Peninsular, which stretches westwards into the mouth of the Parrett.</p> <p>Between Hinkley and Stolford the gravel beaches have been greatly denuded and only a narrow strip of shingle is currently present. Currently the main defence is provided by a rock revetment, but this is also holding the coastline away from its natural alignment, which may be exacerbating the issue of beach loss.</p>	<p>The realignment of defences during this epoch will reduce the likelihood that the gravel beach along this stretch would become submerged during this epoch as it is able to adapt to rising sea levels.</p> <p>A small embayment may form here that will encourage more beach sediment to remain in this area, although this may reduce transport of sediment further eastwards. However, this would be limited in any case by the continued defences at Hinkley Point that will continue preventing new sediment inputs from further west reaching this area (and areas to the east towards the mouth of the Parrett Estuary).</p>	<p>Due to the impact on sediment drift of both the defences at Hinkley Point power station and the natural headland of Hinkley Point, the beach along this stretch (and those to the east) are predicted to have little incoming sediment to maintain them as sea level rise accelerates.</p> <p>Realignment of the defences along this stretch during the medium term would create more of an embayment between Hinkley and Stolford, which may, over time, see beach deposition as any sediment which is transported around Hinkley Point enters this area and is unable to be transported further eastwards.</p>
<b>7d33 – Stolford</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>Rock revetment fronting earth embankment provides defence against the risk of flooding and erosion to Stolford. These defences will require ongoing maintenance during this epoch, whilst measures are developed to plan and implement the medium term policy of ‘Managed Realignment’.</p>	<p>As the existing defences reach the end of their effective life during the early part of this period, defences would be re-built in a realigned (landward) position to maintain an adequate level of protection against the risk of flooding.</p>	<p>The realigned defences will require ongoing maintenance during this epoch to ensure that they continue to maintain an adequate level of protection.</p>
	<p>The hinterland along this stretch is low-lying, forming the start of the Steart Peninsular, which stretches westwards into the mouth of the Parrett.</p>	<p>Realignment of the defences along this stretch during this epoch would reduce the degree to which this section would form an additional headland that would block any sediment that does</p>	<p>Due to the impact on sediment drift of both the defences at Hinkley Point power station and the natural headland of Hinkley Point, the beach along this stretch (and those to the east) are predicted</p>



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>Along this frontage at Stolford, the gravel beaches have been greatly denuded and only a narrow strip of shingle is currently present. Currently the main defence is provided by a rock revetment, but this is also holding the coastline away from its natural alignment, which may be exacerbating the issue of beach loss.</p>	<p>enter this area from the west from being transported eastwards along the Steart Peninsula (i.e. minimise the impact of realignment in the adjacent section between Hinkley and Stolford which would likely form an embayment).</p> <p>The gravel beach along this stretch could however become submerged during this epoch as it is constrained in adapting to rising sea levels by the continued presence of defences, although realignment of defences may reduce this effect.</p>	<p>to have little incoming sediment to maintain them as sea level rise accelerates.</p> <p>Realignment of the defences along this stretch during the medium term would reduce the degree to which this section would form an additional headland that would block any sediment that does enter this area from the west from being transported eastwards along the Steart Peninsula (i.e. minimise the impact of realignment in the adjacent section between Hinkley and Stolford which would likely form an embayment).</p>
<b>7d34 – Stolford to Wall Common</b>	<p><b>Policy = Hold the Line / Managed Realignment</b></p> <p>Along this stretch east of Stolford to Wall Common, defences are in the form of gabion walls. These defences are in a poor condition and would need to be significantly upgraded if they were to provide adequate levels of protection in the future.</p> <p>However, under this scenario, the defences would not be renewed in their existing position, but rather the defences would be constructed in a realigned (landward) position with the existing defence line then being artificially breached. The exact position and form of the realignment in this area is at present uncertain, although ongoing detailed studies as part of the Steart Managed Realignment Project will identify the most appropriate way in which this realignment should</p>	<p><b>Policy = Hold the Line / No Active Intervention</b></p> <p>Defences realigned in the short term would require ongoing maintenance during this period so long as it remains economically justified to do so.</p> <p>The existing shoreline will be subject to No Active Intervention.</p>	<p><b>Policy = Hold the Line / No Active Intervention</b></p> <p>Defences realigned in the short term would require ongoing maintenance during this period so long as it remains economically justified to do so.</p> <p>The existing shoreline will be subject to No Active Intervention.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	occur.		
	<p>Along this stretch between Stolford and Wall Common (to the west of Steart), protection from flooding is currently provided by the shingle barrier and attenuation of waves across the intertidal flats and salt-marshes, which become prevalent towards Steart. The general trend has been long term erosion of both the salt marsh and the shingle beach and this net trend is expected to continue in the future along much of the frontage.</p> <p>‘Managed Realignment’ during this epoch would provide space for the development of more intertidal habitat and salt marsh over the low-lying hinterland to counter the impacts of this erosion.</p> <p>As a result of artificial breaching as part of implementation of this policy, a tidal inlet would form which would reduce the stability of adjacent sections of ridge and thus may lead to subsequent enlargement of the breach.</p> <p>The breach would be able to re-seal should there be sufficient sediment, resulting in a need for management intervention to maintain the artificial breach. However the continued defences at Hinkley Point may prevent this during this period, and breaches may become permanent naturally as a result.</p>	<p>The gravel ridge along this stretch is predicted to continue eroding during this epoch, with the ridges rolling back to a more natural and less exposed alignment. This would be aided by the realignment of defences along this stretch in the short term, with the beach allowed to roll back towards the realigned defence position.</p> <p>There is likely to be widening of the artificial breach created in the short term during this epoch, resulting in increased inundation of intertidal areas created under the policy of ‘Managed Realignment’ in the preceding epoch.</p> <p>The maintenance of realigned defences during this epoch, if economically justified, would minimise the risk of this flooding affecting key infrastructure by allowing construction of defences in key areas (e.g. around electricity pylons).</p> <p>The breach along this stretch would be able to re-seal should there be sufficient sediment, however the continued defences at Hinkley Point is likely to prevent this during this period and breaches would likely become permanent naturally.</p>	<p>Due to the impact on sediment drift of both the defences at Hinkley Point power station and the natural headland of Hinkley Point, and the realignment of the defence line between Hinkley and Stolford during this epoch, the gravel ridges along this stretch are predicted to have little incoming sediment to maintain them and they may narrow as well as migrating landwards due to sea level rise towards realigned defence positions.</p> <p>Ridge erosion may lead to further widening of the artificial breach originally created in the short term along this stretch resulting in increased inundation of inter-tidal areas. Breaches may become permanent should there be insufficient sediment to naturally repair them.</p>
7d35 – Steart	Policy = Hold the Line / Managed Realignment	Policy = No Active Intervention	Policy = No Active Intervention

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
Village	<b>moving towards No Active Intervention</b>		
	<p>Embankment defences situated along the Steart Peninsula, a spit that extends from west to east to enclose the western side of the mouth of the Parrett Estuary, currently protect Steart village from flood risk.</p> <p>These defences are in poor condition and would be unlikely to attract public funds to replace them in the medium term. To retain defences here would also likely exacerbate coastal squeeze (narrowing of the shoreline), resulting in narrowing or even loss of the fronting beach and intertidal areas.</p> <p>Therefore defences could be maintained during this period along the open coast side if it remains economically viable to do so, whilst measures are developed for adapting to the medium term policy of no active intervention (when the existing defences reach the end of their effective life). From the Parrett Estuary side, managed realignment of defences could be implemented to aid habitat creation during this period.</p>	<p>As the existing defences reach the end of their effective life during the early part of this period, they would not be replaced and maintenance would be withdrawn. The defences would therefore deteriorate and eventually fail during this epoch.</p> <p>As a result of this policy here and in adjacent sections, the Steart Peninsula would be allowed to evolve naturally in the long term. This would result in the loss of Steart village and so adaptation measures may be required in this area.</p> <p>The transition to no active intervention may be aided by introduction of regulated tidal exchange measures creating inter-tidal habitat in this area in the short term. This is currently being considered as part of the ongoing Steart Managed Realignment Project.</p> <p>As part of the move to no active intervention, there may remain a need to allow localised realignment of defences to protect power lines, if it is not possible for these to be relocated.</p>	<p>There would be no defences along this section, which would be allowed to evolve naturally.</p> <p>If required for protection of power lines (if not possible to relocate them), retention of localised defences for this purpose is not likely to have a significant impact upon natural processes; although achievement of this is likely to become increasingly technically difficult and so it may prove more cost effective for power lines to be relocated during this period.</p>
	<p>Along this stretch, protection from flooding is currently provided by the existing defences fronted by a shingle barrier and attenuation of waves across the intertidal flats and salt-marshes, which become prevalent towards Steart. The general trend has been long term erosion of both the salt marsh and the shingle beach and this net</p>	<p>The gravel ridge along the western part of this stretch towards Wall Common is predicted to continue eroding during this epoch, with the ridges rolling back to a more natural and less exposed alignment. The low-lying hinterland is likely to become increasingly at risk from flooding via overtopping, with the road access to Steart</p>	<p>Due to the impact on sediment drift of both the defences at Hinkley Point power station and the natural headland of Hinkley Point, the gravel ridges along this stretch are predicted to have little incoming sediment to maintain them and they may narrow further as well as migrating</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>trend is expected to continue in the future along much of the frontage.</p> <p>Sediment transport rates along this stretch to the east of Wall Common are negligible and therefore the beach in this region may remain more stable during this epoch.</p>	<p>also becoming intermittently cut-off as a result; although this will only be an issue for as long as Steart village remains. This would be exacerbated by lack of new sediment entering this area from further west caused by continued defence at Hinkley Point.</p> <p>Steart Point to the east of this stretch interacts with the Parrett Estuary; therefore any changes in the estuary regime may affect this shoreline. It has been suggested that in the long term a new channel could be cut through the Steart Peninsula; this would significantly alter the hydrodynamic and sedimentary regime of the whole area.</p> <p>However, potential changes to the regime of the Parrett, and its interaction with the open coastline are not well understood; therefore the impacts of any changes within the estuary on this frontage are difficult to quantify.</p> <p>The natural evolution and realignment of this section as a result of the move to No Active Intervention could alter the course of the Parrett low-water channel, which in turn could potentially impact upon the right bank of the River Parrett around Huntspill River. However, other studies have shown that this issue is best dealt with by managing the right bank of Parrett rather than management along this stretch (Atkins, April 2009).</p>	<p>landwards due to sea level rise.</p> <p>Ridge erosion may lead to breaching to the west of Steart towards Wall Common resulting in hinterland flooding. Breaches may become permanent should there be insufficient sediment to naturally repair them. In this instance a tidal inlet would form which would reduce the stability of adjacent sections of ridge and thus may lead to subsequent enlargement of the breach.</p> <p>Salt marsh would be likely to develop on Steart Peninsula as it is able to adapt landwards as sea levels rise, no longer constrained by any defences at Steart village.</p> <p>Steart Point to the east of this stretch interacts with the Parrett Estuary; therefore any changes in the estuary regime may affect this shoreline. It has been suggested that in the long term a new channel could be cut through the Steart Peninsula; this would significantly alter the hydrodynamic and sedimentary regime of the whole area. However, potential changes to the regime of the Parrett, and its interaction with the open coastline are not well understood; therefore the impacts of any changes within the estuary on this frontage are difficult to quantify.</p> <p>The natural evolution and realignment of this section as a result of the move to No Active Intervention could alter the course of the Parrett low-water channel, which in turn could potentially</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
			impact upon the right bank of the River Parrett around Huntspill River. However, other studies have shown that this issue is best dealt with by managing the right bank of Parrett rather than management along this stretch (Atkins, April 2009).
7d36 – South of Steart Village to north of Combwich (line of national grid power lines)	<b>Policy = Hold the Line</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	<p>Much of this stretch is undefended, although some embankments are present, situated more on the estuary side of this section, and provide localised defence against the risk of flooding.</p> <p>These embankments are unlikely to attract public funds to replace them in the medium to long term.</p> <p>Therefore defences would be maintained during this period, whilst measures are developed for adapting to the medium term policy of no active intervention (when the existing defences reach the end of their effective life).</p>	<p>As the existing defences reach the end of their effective life during the early part of this period, they would not be replaced and maintenance would be withdrawn. The defences would therefore deteriorate and eventually fail during this epoch.</p> <p>As a result of this policy here and in adjacent sections, the Steart Peninsula would be allowed to evolve naturally in the long term. This would result in the loss of Steart village and so adaptation measures may be required in this area.</p> <p>The transition to no active intervention may be aided by introduction of regulated tidal exchange measures creating inter-tidal habitat in this area in the short term. This is currently being considered as part of the ongoing Steart Managed Realignment Project.</p> <p>As part of the move to no active intervention, there may remain a need to allow localised realignment of defences to protect power lines, if it is not possible for these to be relocated.</p>	<p>There would be no defences along this section, which would be allowed to evolve naturally.</p> <p>If required for protection of power lines (if not possible to relocate them), retention of localised defences for this purpose is not likely to have a significant impact upon natural processes; although achievement of this is likely to become increasingly technically difficult and so it may prove more cost effective for power lines to be relocated during this period.</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>This section forms the seaward end of the Steart Peninsular, which stretches westwards into the mouth of the Parrett from Hinkley Point.</p> <p>Along this stretch, protection from flooding is currently provided primarily by the shingle barrier and attenuation of waves across the intertidal flats and salt-marshes, which become prevalent towards Steart. The general trend has been long term erosion of both the salt marsh and the shingle beach and this net trend is expected to continue in the future along much of the frontage.</p> <p>Sediment transport rates along this stretch are negligible and therefore the beach in this region may remain more stable during this epoch.</p>	<p>The gravel ridge along this stretch is predicted to continue eroding during this epoch, with the ridges rolling back to a more natural and less exposed alignment. The low-lying hinterland is likely to become increasingly at risk from flooding via overtopping.</p> <p>Localised breaches may also occur as a result of sea level rise and the reduced protection afforded by the shingle ridge, with the potential for this to cause flooding of the wider area of low-lying land that makes up the Steart Peninsula. Such breaches would be able to re-seal should there be sufficient sediment, however the continued defences at Hinkley Point may prevent this and breaches may become permanent.</p> <p>Steart Point interacts with the Parrett Estuary; therefore any changes in the estuary regime may affect this shoreline. It has been suggested that in the long term a new channel could be cut through the Steart Peninsula; this would significantly alter the hydrodynamic and sedimentary regime of the whole area. However, potential changes to the regime of the Parrett, and its interaction with the open coastline are not well understood; therefore the impacts of any changes within the estuary on this frontage are difficult to quantify.</p> <p>The natural evolution and realignment of this section as a result of the move to No Active Intervention could alter the course of the Parrett low-water channel, which in turn could potentially</p>	<p>Due to the impact on sediment drift of both the defences at Hinkley Point power station and the natural headland of Hinkley Point, and realignment of the coast between Hinkley Point and Steart, the gravel ridges along this stretch are predicted to have little incoming sediment to maintain them and they may narrow as well as migrating landwards due to sea level rise.</p> <p>Ridge erosion may lead to breaching resulting in hinterland flooding. Breaches may become permanent should there be insufficient sediment to naturally repair them. In this instance a tidal inlet could form which would reduce the stability of adjacent sections of ridge and thus may lead to subsequent enlargement of the breach.</p> <p>Steart Point interacts with the Parrett Estuary; therefore any changes in the estuary regime may affect this shoreline. It has been suggested that in the long term a new channel could be cut through the Steart Peninsula; this would significantly alter the hydrodynamic and sedimentary regime of the whole area. However, potential changes to the regime of the Parrett, and its interaction with the open coastline are not well understood; therefore the impacts of any changes within the estuary on this frontage are difficult to quantify.</p> <p>The natural evolution and realignment of this section as a result of the move to No Active Intervention could alter the course of the Parrett low-water channel, which in turn could potentially</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		impact upon the right bank of the River Parrett around Huntspill River. However, other studies have shown that this issue is best dealt with by managing the right bank of Parrett rather than management along this stretch (Atkins, April 2009).	impact upon the right bank of the River Parrett around Huntspill River. However, other studies have shown that this issue is best dealt with by managing the right bank of Parrett rather than management along this stretch (Atkins, April 2009).
<b>7d37 – Parrett Estuary from line of national grid power lines to Combwich</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	Along this outer left bank of the Parrett Estuary, embankment defences constrain the estuary channel over much of its length.  These embankment defences would be maintained during this period to continue to protect property and critical infrastructure against the risk of flooding.	The defences would continue to be maintained during this period, so long as it remains economically viable to do so, to protect property and critical infrastructure against the risk of flooding.	The defences would continue to be maintained during this period, so long as it remains economically viable to do so, to protect property and critical infrastructure against the risk of flooding.
	The constrained nature of the Parrett channel along the length of the Parrett Estuary means that there is little opportunity for change during this epoch.	Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.  Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Sediment deposition in the lower reaches may increase. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime.  Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise. On	Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant.  Increased water levels would increase pressure on the defences upstream and therefore works are likely to be required to address this. Allowing the natural realignment of this outer part of the estuary under the policy of No Active Intervention would therefore minimise these effects.  Changes in the estuary may also affect the adjacent coastline through affecting the position of the outer low water channel. It has been postulated (Pethick, 2002) that the increase in

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>the opposite side from this stretch, the Huntspill Channel regulates discharge from the lower parts of the River Brue catchment area, and as such provides a steady inflow of water into the lower Parrett. Increases in the discharge through this channel would be likely to cause further localised erosion of the banks either side of the confluence (i.e. along this stretch), and of the area of salt marsh downstream.</p> <p>Localised pressure on the defences along this stretch may also result from changes in the position of the low water channel – which are difficult to predict without further studies.</p>	<p>tidal prism would cause the outer low water channel to swing clockwise, which would affect the coastline of Burnham. Natural realignment along this part of the outer estuary as a result of the No Active Intervention policy could significantly impact upon this evolution, and so this would need to be considered in detail prior to any implementation.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise. On the opposite side from this stretch, the Huntspill Channel regulates discharge from the lower parts of the River Brue catchment area, and as such provides a steady inflow of water into the lower Parrett. Increases in the discharge through this channel would be likely to cause further localised erosion of the banks either side of the confluence (i.e. along this stretch), and of the area of salt marsh downstream.</p>
7d38 – Comwich	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	The settlement of Comwich, on the left bank of the Parrett Estuary, is protected against the risk of flooding primarily by flood embankments, though some short lengths of flood walls are also present. These defences will need to be upgraded (re-built with larger structures) during this epoch such that they continue to provide an adequate	The defences at Comwich will require ongoing maintenance during this epoch.	The defences at Comwich will require ongoing maintenance and likely further upgrade towards the end of this epoch, as sea levels rise and the structures constructed in the short term near the end of their effective life.



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	level of protection (Environment Agency 2009).		
	The constrained nature of the Parrett channel along this stretch means that there is little opportunity for change during this epoch.	<p>Maintenance of the defences at Comwich means that the estuary along this stretch will remain constrained. Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.</p> <p>Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Sediment deposition in the lower reaches may increase. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p> <p>Localised pressure on the defences at Comwich may also result from changes in the position of the low water channel – which are difficult to predict without further studies.</p>	<p>Maintenance of the defences at Comwich means that the channel will remain constrained along this part of the estuary.</p> <p>Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant.</p> <p>Increased water levels would increase pressure on the defences and therefore works are likely to be required to address this.</p> <p>Changes in the estuary may affect the adjacent coastline through affecting the position of the outer low water channel. It has been postulated (Pethick, 2002) that the increase in tidal prism would caused the outer low water channel to swing clockwise, although this is likely to have a lesser effect on this stretch within the estuary.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p>
7d39 – Comwich to Bridgwater	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>
	The Parrett Estuary along this stretch is constrained over much of its length by embankments with localised revetments and flood walls that provide protection against the risk of flooding to a large area of agricultural land as well	<p>The defences along this stretch, having been rebuilt in the short term, will require ongoing maintenance during this epoch.</p> <p>Along part of this stretch, a surge barrier may also be constructed during the latter part of this</p>	All defences along this stretch will require ongoing maintenance during this epoch. As they reach the end of their effective life, they will be re-built in realigned positions to continue to reduce the risk of flooding to people, property

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	<p>as settlements at Cannington and Chilton Trinity.</p> <p>Under this scenario, the defences along this stretch would need to be re-built towards the end of this epoch, with much larger structures than exist at present being constructed such that an adequate level of protection is maintained in the future.</p>	<p>epoch in support of the defences upstream at Bridgwater (Environment Agency, 2009).</p>	<p>and infrastructure in a sustainable way.</p> <p>There would be continued maintenance of the surge barrier constructed in the latter part of the preceding epoch, in support of the defences at Bridgwater.</p>
	<p>The constrained nature of the Parrett channel along this stretch means that there is little opportunity for change during this epoch.</p>	<p>Maintenance of the defences means that the estuary along this stretch will remain constrained. Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.</p> <p>Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Sediment deposition in the lower reaches may increase. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p>	<p>Maintenance of the defences means that the channel remains constrained along much of the estuary. This effect would be reduced once defences are realigned during this epoch.</p> <p>Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant.</p> <p>Increased water levels would increase pressure on the defences and therefore works are likely to be required to address this.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p>
<b>7d40 – Bridgwater (upper Parrett Estuary)</b>	<p><b>Policy = Hold the Line</b></p> <p>The Parrett Estuary along this stretch, which encompasses the town of Bridgwater, is constrained over much of its length by a range of defences including embankments, concrete or</p>	<p><b>Policy = Hold the Line</b></p> <p>The Bridgwater defences will require ongoing maintenance during this epoch.</p> <p>Downstream of Bridgwater, a surge barrier may also be constructed during the latter part of this</p>	<p><b>Policy = Hold the Line</b></p> <p>All defences along this stretch will require ongoing maintenance and possible further upgrade towards the end of this epoch, as sea levels rise and the structures constructed in the short term</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	masonry walls, sheet piled walls and flood walls. These defences will require maintenance and improvement during this epoch (Environment Agency, 2009) such that they are able to provide adequate levels of protection against the risk of flooding.	epoch in support of the defences at Bridgwater (Environment Agency, 2009).	near the end of their effective life.  There would be continued maintenance of the surge barrier constructed in the latter part of the preceding epoch, in support of the defences at Bridgwater.
	The constrained nature of the Parrett channel in this upper part of the estuary means that there is little opportunity for change during this epoch.	Maintenance of the defences in this upper part of the estuary means that the estuary will remain constrained. Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.  Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime. Construction of a surge barrier would serve to reduce the impacts of climate change on Bridgwater.  Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.	Maintenance of the defences means that the channel remains constrained along much of the estuary.  Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant.  Increased water levels would increase pressure on the defences and therefore works are likely to be required to address this. Maintenance of a surge barrier would continue to minimise the impact of this on Bridgwater.  Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.
<b>7d41 – Bridgwater to Dunball</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	The Parrett Estuary along this length is constrained by embankment defences that provide protection against the risk of flooding to the low-lying hinterland, upon which a large amount of development and infrastructure is	The defences along this stretch will require ongoing maintenance during this epoch. Towards the end of this period, these defences will need to be replaced with larger defences.	All defences along this stretch will require ongoing maintenance during this epoch.  There would be continued maintenance of the surge barrier constructed in the latter part of the

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>located.</p> <p>These defences will require ongoing maintenance during this epoch in order to ensure adequate levels of protection are maintained.</p>	<p>Along part of this stretch, a surge barrier may also be constructed during the latter part of this epoch in support of the defences upstream at Bridgwater (Environment Agency, 2009).</p>	<p>preceding epoch, in support of the defences at Bridgwater.</p>
	<p>The constrained nature of the Parrett channel long this stretch means that there is little opportunity for change during this epoch.</p>	<p>Maintenance of the defences along this stretch means that the estuary will remain constrained in this area. Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.</p> <p>Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Sediment deposition in the lower reaches may increase. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p>	<p>Maintenance of the defences means that the channel will remain constrained along this part of the estuary.</p> <p>Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant.</p> <p>Increased water levels would increase pressure on the defences and therefore works are likely to be required to address this.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p>
<b>7d42 – Dunball to River Brue</b>	<p><b>Policy = Hold the Line</b></p> <p>This area of the right bank of the Parrett Estuary is constrained over much of its length by embankments with localised revetments that provide protection against the risk of flooding to a large expanse of low-lying, largely agricultural, hinterland.</p> <p>Under this scenario, all of the defences along this</p>	<p><b>Policy = Managed Realignment/Hold the Line</b></p> <p>During this epoch, parts of this stretch will undergo ‘Managed Realignment’; involving construction of set-back defences and breaching of existing embankments.</p> <p>This is anticipated to occur at Pawlett Ham (Environment Agency, 2009), resulting in creation of a new area of salt marsh and defence of the</p>	<p><b>Policy = Managed Realignment/Hold the Line</b></p> <p>All defences along this stretch, whether in existing or realigned positions, will require continued maintenance during this epoch.</p> <p>The continued policy of ‘Managed Realignment’ would allow further areas along this stretch to be realigned during this epoch.</p>

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	stretch would be maintained during this epoch whilst measures are investigated and developed to implement 'Managed Realignment' of defences along parts of this stretch (most likely at Pawlett Ham (Environment Agency, 2009)).	<p>wider area of low-lying hinterland being maintained by defences in a more sustainable position; though implementation of this will also be dependent upon improvements to the upstream defences at Bridgwater as realignment here could potentially affect the flood risk upstream.</p> <p>Defences not subject to realignment along this stretch would need to be maintained or even improved during this epoch (i.e. replaced with larger structures) such that they continue to provide protection against the risk of flooding.</p>	This is anticipated to occur at Pawlett and Huntspill Levels during this epoch, as the Huntspill Sluice reaches the end of its effective life and needs replacement.
	<p>The constrained nature of the Parrett channel along this stretch means that there is little opportunity for change during this epoch.</p> <p>The key risk will be from the meandering nature of the low water channel which will put local pressure on the various defences within the estuary.</p>	<p>Maintenance of the defences along this stretch (where defences are not realigned during this epoch) means that much of the estuary in this area will remain constrained.</p> <p>Currently the estuary is in a stable state and this is likely to continue for much of this period, however, as sea level rise this will start to impact on the estuary as a whole.</p> <p>Sea level rise is expected to result in an increased tidal prism and therefore an increase in tidal flow. Sediment deposition in the lower reaches may increase. Studies (EA, 2009) suggest that overall sea level rise will have a marginal impact on the existing estuarine regime.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and</p>	<p>Maintenance of the defences along this stretch, particularly where defences are not realigned, means that the channel will remain constrained along parts of this section of the estuary.</p> <p>Sea level rise will increase the tidal prism, resulting in increased tidal flows, although the estuary is expected to remain flood dominant. Realignment along this stretch may affect this, though it is difficult to quantify any such impacts without further study.</p> <p>Increased water levels would increase pressure on the defences, particularly those that remain in existing alignments, and therefore works are likely to be required to address this.</p> <p>Changes in the estuary in this area may affect the adjacent coastline through affecting the position of the outer low water channel. It has been</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>inundation of low level land as sea levels rise.</p> <p>At the northern end of this stretch, the Huntspill Channel regulates discharge from the lower parts of the River Brue catchment area, and as such provides a steady inflow of water into the lower Parrett. Increases in the discharge through this channel would be likely to cause further localised erosion of the banks either side of the confluence, and of the area of salt marsh downstream.</p> <p>Realignment in parts of this section during this epoch could help mitigate the effects on salt marsh areas, by providing space for new areas of salt marsh to develop.</p> <p>Localised pressure on defences may also result from changes in the position of the low water channel – which are difficult to predict without further studies.</p>	<p>postulated (Pethick, 2002) that the increase in tidal prism would cause the outer low water channel to swing clockwise, which would affect the coastline of Burnham to the north of this stretch.</p> <p>Climate change may also change the proportions of fresh and saltwater with an increase in rainfall potentially causing an increase in river flows and inundation of low level land as sea levels rise.</p> <p>At the northern end of this stretch, the Huntspill Channel regulates discharge from the lower parts of the River Brue catchment area, and as such provides a steady inflow of water into the lower Parrett. Increases in the discharge through this channel would be likely to cause further localised erosion of the banks either side of the confluence, and of the area of salt marsh downstream.</p> <p>Realignment in this area could help mitigate the effects on salt marsh areas, by providing space for new areas of salt marsh to develop. Realignment in this area would also be likely to mitigate any increased pressure on defences in this area arising from possible changes in the position of the low-water channel.</p>
7d43 – Burnham-on-Sea and Highbridge	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>
	Along the Burnham-on-Sea frontage there is a recurved seawall and stepped revetment constructed in 1983, which is assumed to remain during this epoch aided by ongoing maintenance.	Along Burnham-on-Sea frontage the recurved seawall constructed in 1983 is assumed to remain, aided by ongoing maintenance; although this will also be dependent upon the future position of the	The defences at Burnham-on-Sea are likely to require upgrading during this epoch in order to continue to provide current levels of protection. This would involve construction of larger

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	<p>There is also a flood gate at Maddocks Slade.</p> <p>Along the north bank of the River Brue, embankment defences that protect Highbridge and Burnham-on-Sea from the risk of flooding would need to be re-built during this period, in order to ensure the required level of protection is maintained.</p>	<p>Parrett low-water channel, any changes in which could have significant implications for flood risk management to the coastal defences to at Burnham-on-Sea.</p> <p>The embankment defences along the north side of the River Brue would be maintained during this period.</p>	<p>defences than presently exist, to address issues of increased sea levels and risk of undermining that may occur as a result of changes in the position of the Parrett Estuary low water channel.</p> <p>The embankment defences along the north side of the River Brue would be maintained and eventually re-built with much larger defences during this period.</p>
	<p>At Burnham the defences will continue to fix the shoreline position and the coast along this stretch is likely to remain generally stable; although localised beach lowering may become an issue.</p> <p>Continued defence along the north side of the River Brue will continue to reduce the risk of flooding to Burnham and Highbridge, although this constrain the channel in this area.</p>	<p>At Burnham, the defences will continue to fix the shoreline position. The vulnerability of this coastline will also depend upon changes within the Parrett estuary, which could affect Stert Island and therefore increase exposure of this coastline. This frontage would also be affected by any change in the outer low water channel of the Parrett; it is possible that this could swing clockwise towards the coast as a result of tidal prism increases.</p> <p>Continued defence along the north side of the River Brue will continue to reduce the risk of flooding to Burnham and Highbridge, although this constrain the channel in this area.</p>	<p>At Burnham, the defences will continue to fix the shoreline position, but more substantial defences may be required in response to both sea level rise and any change in the outer low water channel of the Parrett. There could also be a risk of outflanking due to erosion of the adjacent undefended dunes along the northern part of this stretch.</p> <p>Continued defence along the north side of the River Brue will continue to reduce the risk of flooding to Burnham and Highbridge, although this constrain the channel in this area.</p>
<b>7d44 – Berrow to Brean (north)</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Managed Realignment</b>
	<p>Along this stretch between Berrow and Brean the coastal dune system is the primary defence – records suggest that this dune ridge has restricted overtopping along this stretch. This natural defence would be supported during this epoch by implementation of dune and beach management,</p>	<p>The coastal dune system along this stretch is the primary defence and although the frontal dunes may erode the backing dune system should continue to provide a high standard of protection from flooding to the wider area of low-lying</p>	<p>The coastal dune system is likely to fail in places, particularly where the dunes are narrower towards the northern end of this stretch, allowing inundation by the sea to occur. The extent of this flooding will be limited by the secondary defences to be constructed landwards of the dune in the</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>to promote a healthier dune system to provide amore robust natural defence in this period, and to manage the roll back of the coast as sea levels rise. This is particularly important along the northern parts of this stretch where dunes are already narrow.</p> <p>This policy could potentially require relocation of some of the more seaward properties along this stretch (which have been developed on the dunes) in order to allow dunes to develop and recover (by allowing sand currently constrained by development to re-enter the system to help stabilise the dunes). The need for this during this period (or the medium term) requires further investigation and would be based upon continual monitoring.</p> <p>Back door flooding to this area is also controlled by flood embankments along the left bank of the River Axe, which would continue to be maintained under this scenario (refer to adjacent units).</p>	<p>hinterland.</p> <p>However, where the dunes become narrower towards the northern end of this stretch, even despite measures in the short term to promote dune stability, dunes will be unlikely to recover to the extent of those to the south at Berrow and so there is a risk of dune erosion resulting in increased risk of overtopping, flooding and even breaching of the dunes.</p> <p>Therefore a set back defence embankment would be constructed landwards of the existing shoreline to reduce the risk of flooding to the wider area of the low-lying Somerset Levels, although this would likely not provide protection to some more seaward properties and infrastructure located along this stretch. The precise location of a set-back defence would need to be determined by more detailed study.</p> <p>Back door flooding to this area is also controlled by flood embankments along the left bank of the River Axe; these would be maintained during this period in order to minimise this risk (refer to adjacent units), and also in support of the 'Managed Realignment' policy along this stretch under this scenario.</p>	<p>preceding epochs.</p> <p>Back door flooding to this area will be controlled during this epoch by a set-back defence, likely extending between the open coast and the Axe Estuary, as the section of coast to the north moves towards a policy of no active intervention (refer to adjacent sections). The precise location of a set-back defence would need to be determined by more detailed study.</p>
	<p>Along this section of undefended coastline, protection against the risk of flooding is dependent upon the coastal dune belt that varies in width along this length, and which is narrowest</p>	<p>Although the trend of dune erosion will continue along this stretch, the flood risk to the hinterland should remain low along much of this frontage due to the higher dunes which lie behind.</p>	<p>The erosional trend will continue along this dune frontage; although flood risk should still remain low along the majority of this stretch due to the high dunes behind much of it.</p>



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>towards the northern end of this stretch. Frontal dune erosion is likely to continue at rates between 0.4 and 2m/year. There is a risk that these frontal dunes could be breached during this period; however, the high dunes behind the majority of this stretch will prevent wide-spread hinterland flooding.</p> <p>Dune erosion could be reduced by introduction of dune and beach management during this epoch; particularly if aided by relocation of seaward properties to allow currently constrained sand supply to be re-activated such that it becomes available to help stabilise the dunes. Despite this, it is unlikely that the dunes would recover to the extent of the dunes towards the southern end of this stretch.</p> <p>Defences within the Axe Estuary will also remain during this period to reduce the risk of back door flooding to this area, as the defences along the Axe Estuary will be subject to a 'Hold the Line' policy in this epoch.</p>	<p>Should the wide intertidal mudflats fronting these dunes erode as they have been recently, there would be predicted to be greater pressure on the dunes, as these mudflats provide protection of the coast through reducing incident wave energy.</p> <p>Where the dunes are narrowest, and despite action in the short term to release sediment to the system and aid dune stabilisation, this trend of erosion would have more significant impacts, with an increasing risk of overtopping and breaching of the dunes which could cause wide-spread flooding of the low-lying Somerset Levels.</p> <p>Construction of a secondary defence position during this epoch landwards of the dunes (at a location to be determined by more detailed studies) would therefore serve to minimise this flood risk extent.</p> <p>Protection of this stretch also relies on defences within the Axe Estuary, which would continue to be maintained to an adequate level during this epoch.</p>	<p>Towards the northern end of this stretch, where the dunes are narrowest, the flood risk to the wider hinterland will be minimised by the secondary defences constructed in the medium term, as the dunes are allowed to roll back landwards towards this defence position as sea levels rise.</p> <p>Defence of this low-lying hinterland will also continue to depend, on continued maintenance of defences along the left bank of the Axe.</p>
<b>7d45 – Brean (north) to Brean Down</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>
	<p>Along this stretch between the northern end of Brean and Brean Down there is a range of defences including a wave return wall, masonry walls, rock armour and gabion baskets. Some of these, such as the gabion baskets are at risk of failure during this period and so will require</p>	<p>The range of defences along this stretch are all at risk of failing as a result of undermining during this period, and measures to address this may be required during this period, along with ongoing maintenance of the structures themselves, to ensure they are able to continue to provide adequate levels of protection for as long as</p>	<p>The existing defences would be maintained for as long as technically feasible, however once the defences reach the end of their effective life (early in this period), it is likely to be more sustainable to realign the defences in order to continue to reduce the risk of extensive flooding of the low-</p>

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	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>replacement.</p> <p>Back door flooding to this area is also controlled by flood embankments along the left bank of the River Axe, which would continue to be maintained under this scenario.</p>	<p>possible.</p> <p>Back door flooding to this area is also controlled by flood embankments along the left bank of the River Axe; these would be maintained during this period in order to minimise this risk, in support of the 'Hold the Line' policy along this stretch.</p>	<p>lying hinterland.</p>
	<p>Between Brean and Brean Down the current defences will continue to fix the shoreline position and reduce the risk of hinterland flooding during this epoch.</p> <p>Defences within the Axe Estuary will also remain during this period to reduce the risk of back door flooding to this area, as the defences along the Axe Estuary will be subject to a 'Hold the Line' policy in this epoch.</p>	<p>Should the wide intertidal mudflats fronting this stretch erode as they have been recently, there would be predicted to be greater pressure on defences as these mudflats provide protection of the coast through reducing incident wave energy. This would be exacerbated by sea level rise causing narrowing of the foreshore (with a larger area covered by more states of the tide).</p> <p>This increased exposure of defences, combined with the defences reaching the end of their effective life towards the end of this epoch and rising sea levels, defences would be maintained for as long as possible during this epoch and into the next, in order to protection against the risk of flooding to the wider low-lying hinterland area.</p> <p>Protection of this stretch also relies on defences within the Axe Estuary, which would continue to be maintained to an adequate level during this epoch.</p>	<p>Provision of a realigned defence position will ensure flood risk to the wider Somerset Levels continues to be reduced whilst allowing the shoreline that is currently defended to evolve and adapt to rising sea levels more naturally.</p> <p>The policy on the west bank of the Axe Estuary in the long-term supports the policy on this stretch (i.e. is also 'Managed Realignment').</p> <p>These policies mean that the future course of the Axe Estuary could alter in the very long term so that it discharges to the south of Brean Down. This could affect how sediment circulates in Bridgwater Bay and further study is required to understand this.</p>
7d46 – Brean Down (south side)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section of hard rock cliffed headland is undefended.	No defences.	No defences.

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	This section comprises the southern half of the resistant Carboniferous limestone headland of Brean Down, which will experience negligible change during this epoch.	Limited change is predicted for the headland at Brean Down; less than 5m by the end of the epoch.	There will be limited change at Brean Down, due to the resistant nature of this headland; less than a total of 10m by the end of the epoch.
<b>POLICY SCENARIO AREA: BREAN DOWN TO ANCHOR HEAD (WESTON BAY)</b>			
<p>This short section of coast starts at Brean Down, and sweeps 7km northeast to Anchor Head where Birnbeck Island lies a hundred meters from the coast. It encompasses Weston Bay and the estuary mouth to the River Axe.</p> <p>The River Axe forms part of the Severn Estuary SSSI, SPA, SAC and Ramsar site. Brean Down is a peninsula of carboniferous limestone of geological and biological national importance and is a designated SSSI. There is also a Local Nature Reserve at Uphill. The prominent limestone hills of the Mendip Hills Area of Outstanding Natural Beauty form a backdrop to Weston-Super-Mare with access into the Bleadon Hills. There is one Scheduled Monument near the River Axe.</p> <p>Weston-Super-Mare is a traditional seaside resort and designated Conservation Area forming a townscape to the northern mouth of the Axe up to and beyond Anchor Head. It is fronted by wide sandy beaches and is a popular tourist destination with many traditional seaside attractions.</p> <p>The long-term Plan is to continue to minimise flood risk to the Somerset Levels and Moors in a sustainable way, while maintaining the natural character and beaches along much of this frontage that attract many tourists and are therefore important to the regional economy.</p> <p>At Uphill, the most sustainable way to achieve this is to appropriately manage the well-established natural dune system. Along parts of the east side of the River Axe there is potential to achieve this through implementing managed realignment whilst also creating habitat of benefit to the wider area.</p> <p>Along the west bank of the River Axe (and between Brean and Brean Down on the adjacent open coast), the long-term Plan for Managed Realignment could see the mouth of the River Axe move to the south of Brean Down. The risk of flooding to the wider Somerset Levels and Moors as a result of this policy change would need to be managed by constructing set-back defences.</p> <p>Flood risk to Weston-super-Mare would continue to be reduced by maintaining the recently constructed sea defences, possibly supported in the future by beach recharge.</p>			
7e01 – Brean Down (north side) to Axe Estuary mouth (west)	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>	<b>Policy = No Active Intervention</b>
	This section of hard rock cliffed headland is undefended.	No defences.	No defences.
	This section comprises the northern half of the resistant Carboniferous limestone headland of Brean Down which is predicted to erode at rates	Cliff erosion at Brean Down is predicted to continue occurring at a very slow rate with infrequent events and therefore by the end of this	Cliff erosion along Brean Down is predicted to continue occurring at a very slow rate with infrequent events and therefore by the end of this

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	similar to historically, with negligible change expected during this period.	epoch total erosion is predicted to be less than 5m.	epoch total erosion is predicted to be less than 10m.
<b>7e02 – Axe Estuary left (west bank (mouth to near Diamond Farm))</b>	<b>Policy = Hold the Line</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>
	<p>Embankments constraining River Axe estuary and protecting low-lying hinterland from flooding are located throughout this section. These will remain during this epoch, aided by ongoing maintenance.</p>	<p>Embankments constraining River Axe estuary along the length of this section, which protect the low-lying hinterland from flooding, will be maintained during this epoch.</p> <p>The management of this section will be heavily influenced by the management on the open coast between Brean and Brean Down. The policy of 'Hold the Line' here supports the like policy on the open coast during this period.</p>	<p>As the embankments constraining the River Axe estuary along this section reach the end of their effective life early in this period, the defence alignment should be moved in line with similar realignment actions on the adjacent open coast (refer to policy units 7d44 and 7d45).</p> <p>This would be directly related to the policy on the adjacent open coast defences between Brean and Brean Down.</p>
	<p>This frontage is controlled at its north-western end by the resistant Carboniferous headland at Brean Down, and forms the western bank of the estuary of the River Axe, which discharges into the southern end of Weston bay.</p> <p>The continued maintenance of the embankments along this stretch that constrain the estuary of the River Axe will prevent any significant change in estuary morphology or processes during this epoch.</p>	<p>The headland of Brean Down will remain a control on the north-western end of this section of the Axe Estuary.</p> <p>The embankments constraining the River Axe will prevent any significant change in estuary morphology or processes.</p> <p>However acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the Axe, increasing the potential for sediment reworking both by water and currents. Climate change may also result in an increase in the freshwater component of the estuary, increasing flood risk.</p>	<p>The headland of Brean Down will remain a control on the north-western end of this section of the Axe Estuary.</p> <p>The effect of embankments constraining the estuary morphology in this area will reduce during this period once the defence line is realigned.</p> <p>Acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the Axe, increasing the potential for sediment reworking both by water and currents. Climate change may also result in an increase in the freshwater component of the estuary, increasing flood risk.</p> <p>If the policy on the open coast between Brean and Brean Down also moves to one of 'Managed</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
			<p>Realignment' during this period, then the policy along this stretch supports the long-term policy of the open coast.</p> <p>These policies could mean that the future course of the Axe Estuary could alter in the very long term so that it discharges to the south of Brean Down. This could affect how sediment circulates in Bridgwater Bay and further study is required to understand this.</p>
<b>7e03 – Axe Estuary right (east) bank (near Diamond Farm to mouth)</b>	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>Embankments along this eastern side of the Axe Estuary constrain the estuary and protect low-lying hinterland from the risk of flooding. These defences will remain during this epoch, aided by ongoing maintenance, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along parts of this section.</p>	<p>As defences reach the end of their effective life during this epoch, implementation of managed realignment would occur along all or parts of this section, based upon investigations undertaken in the short term.</p> <p>Any areas where realignment does not occur would require the embankments to be re-built with much larger structures in this period, such that they continue to provide the required level of protection to the extensive low-lying hinterland.</p>	<p>Defences along this eastern side of the Axe Estuary, either in realigned or existing positions, would require ongoing maintenance during this epoch.</p>
	<p>The embankments constraining the River Axe along this will prevent any significant change in estuary morphology or processes.</p>	<p>The embankments constraining the eastern side of the Axe Estuary in this area will prevent any significant change in shoreline morphology or processes; although this may effect may be reduced by realignment of some or all defences during this epoch.</p> <p>However acceleration in the rate of sea level rise</p>	<p>The embankments constraining this eastern side of Axe Estuary will prevent any significant change in estuary morphology or processes. However acceleration in the rate of sea level rise would increase water depths, tidal prism and current velocities in the Axe, increasing the potential for sediment reworking both by water and currents. Climate change may also result in an increase in</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
		<p>would increase water depths, tidal prism and current velocities in the Axe, increasing the potential for sediment reworking both by water and currents. Climate change may also result in an increase in the freshwater component of the estuary, increasing flood risk.</p> <p>As such, any defences not realigned would need to be re-built, with these defences likely needing to be much larger than the existing defences in order to provide adequate levels of protection in the long term.</p>	the freshwater component of the estuary, increasing flood risk.
7e04 – Axe Estuary mouth to Uphill	<b>Policy = Hold the Line</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Hold the Line</b>
	<p>This stretch along the southern part of Weston Bay extends between the mouth of the River Axe and Uphill.</p> <p>Along this stretch, there is a seawall extending northwards from the River Axe to Uphill. This is predicted to begin to fail towards the end of this period.</p> <p>Therefore, maintenance of the seawall would occur during this period to ensure the defence continues to provide protection against the risk of flooding for as long as possible, whilst measures are developed to plan and implement the medium term policy of 'Managed Realignment' along this section; once the defence becomes unsustainable to maintain.</p>	<p>As the seawall defence reaches the end of its effective life in the early part of this epoch, implementation of managed realignment would occur along this section, based upon investigations undertaken in the short term.</p>	<p>The realigned defences would be maintained during this period.</p>
	Defences along this stretch will remain during this	Shoreline retreat and foreshore lowering along	Shoreline retreat and foreshore lowering along

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>period, and so continue to minimise flooding risk along this section.</p> <p>Low rates of erosion of the resistant headlands that bound Weston Bay (Brean Down and Anchor Head) and the lack of incoming sediment from other sources mean that there is little fresh sediment input to feed the beach fronting the defences along this stretch.</p>	<p>this stretch would be reduced during this period once defences are realigned; allowing the shoreline to adapt more naturally to rising sea levels.</p>	<p>this stretch, where defences (even in realigned positions) prevent natural retreat, is predicted to continue during this epoch.</p> <p>The erosion of the dunes to the north of Uphill in this epoch will make maintenance of the defences along this stretch increasingly difficult.</p>
7e05 – Uphill to Weston-super-Mare (south)	<b>Policy = Managed Realignment</b>	<b>Policy = Managed Realignment</b>	<b>Policy = Managed Realignment</b>
	<p>Along this stretch between Uphill and Weston-super-Mare, there is a short stretch of undefended dunes that provide a natural defence against flood risk. These would be allowed to continue to evolve naturally without significant intervention, although they would be subject to ongoing monitoring and pro-active dune management if required to ensure that the natural defence function continues to be provided during this epoch.</p>	<p>The dunes along this section will continue to provide a natural defence, but the effectiveness of these may begin to diminish as sea levels rise.</p> <p>Ongoing monitoring and pro-active dune management would occur to ensure that the natural defence function continues to be provided during this epoch.</p>	<p>Even with pro-active dune management, the dunes along this section are likely to be increasingly ineffective as a natural form of defence as sea level rise accelerates. Ongoing monitoring would also occur to ensure that the natural defence function continues to be provided during this epoch, however, additional intervention towards the end of this period may become necessary; possibly constructing secondary defences inland to provide additional flood protection to Uphill and Weston-super-Mare beyond the natural defence function provided by the dunes.</p>
	<p>Low rates of erosion of the resistant headlands that bound Weston Bay (Brean Down and Anchor Head) and the lack of incoming sediment from other sources mean that there is little fresh sediment input to feed the beaches and dune system along this stretch.</p> <p>The dunes along this stretch are predicted to</p>	<p>Shoreline retreat is predicted to continue during this epoch along this stretch. The dune system along this stretch is also likely to suffer erosion, possibly affecting the performance of the defence function of the dunes. Pro-active dune management would reduce the erosion effect and control the rate of retreat.</p>	<p>Shoreline retreat along this stretch is predicted to continue during this epoch, controlled to some extent by ongoing dune management.</p> <p>The dune system here is also likely to suffer further erosion, and the risk of flooding of the low-lying hinterland (part of the Somerset Levels) is predicted to increase throughout this epoch,</p>

Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
	<p>remain in a similar position as at present in this epoch, aided by pro-active dune management and a southerly drift of sediment from the northern part of the bay (although material is recycled back to the northern beaches annually), though a slight trend of erosion, and particularly foreshore narrowing and steepening, could begin to occur along this stretch towards 2025.</p>	<p>Risk of flooding of the low-lying hinterland (part of the Somerset Levels) is predicted to increase throughout this epoch, particularly with rising sea levels and increased storminess related to climate change.</p> <p>The extra pressure on the dunes that this will cause will make maintenance of the seawall defences in the adjacent section to the south increasingly problematic as well.</p>	<p>particularly with rising sea levels and increased storminess related to climate change.</p> <p>Potential for a breach of the dunes is high during this epoch which would cause significant flooding. There is potential for the dune belt to be entirely lost in the centre of this frontage during this epoch. This would be predicted to result in the development of low cliffs due to erosion of the backing hinterland. Construction of secondary defences at the back of the dunes during this epoch would therefore serve to provide additional flood risk protection in this area.</p> <p>The erosion of the dunes in this epoch will also make maintenance of the defences in the adjacent section to the south increasingly difficult.</p>
<b>7e06 – Weston-Super-Mare</b>	<p><b>Policy = Hold the Line</b></p> <p>The main defence along this frontage is a seawall protecting the town of Weston-Super-Mare from flooding. These defences are in the process of being upgraded and will remain an influence upon coastal evolution throughout this epoch.</p> <p>This will continue to be supported by annual beach recycling activities, which retrieves sediment from the southern part of the bay and re-deposits it along this stretch.</p>	<p><b>Policy = Hold the Line</b></p> <p>The main defences along this frontage protect the town of Weston-Super-Mare from flooding and consist of a seawall. These defences would continue to be present and influence coastal evolution as a result of ongoing maintenance during this epoch.</p> <p>It may also become necessary to implement further shoreline defences, in the form of beach recharge and control structures, during this epoch to support the seawall as the fronting foreshore experiences narrowing and steepening in response to rising sea levels.</p>	<p><b>Policy = Hold the Line</b></p> <p>The main defences along this frontage protect the town of Weston-Super-Mare from flooding and consist of a seawall. These defences would continue to be present and influence coastal evolution as a result of ongoing maintenance during this epoch.</p> <p>If not occurred in the medium term, then it may become necessary to implement further shoreline defences, in the form of beach recharge and control structures, during this epoch to support the seawall as the fronting foreshore experiences narrowing and steepening in response to rising</p>



Possible Policy Unit & Number	Predicted Change for Preferred Policy		
	Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)
			sea levels.
	<p>This frontage is controlled at its northern end by the resistant Carboniferous headland at Anchor Head, which, along with the headland at Brean Down, forms a closed sediment system.</p> <p>Erosion at Anchor Head, where natural rock is exposed (as much of the headland is armoured with seawalls) is predicted to be negligible during this epoch.</p> <p>Along the main frontage of Weston-super-Mare the defences will continue to hold the shoreline position and minimise the risk of localised flooding.</p> <p>These low rates of erosion of the headlands that bound Weston Bay to the north and south, and the lack of incoming sediment from other sources, means that there is little fresh sediment input to feed the beaches along this stretch. Recently there has been a trend of slight erosion, particularly foreshore lowering and steepening associated with the defences along this northern part of the bay. This is predicted to continue during this epoch.</p>	<p>Foreshore lowering along this section, where defences prevent natural retreat, is predicted to continue during this epoch.</p> <p>The defences along this frontage will maintain the shoreline. These defences are predicted to become increasingly vulnerable as the foreshore lowers. The presence of the defences will also limit the sediment available to feed the dunes to the south towards Uphill, and therefore this may add to the erosion here.</p> <p>Due to this increasing vulnerability, beach recharge, likely supported by shoreline control structures (i.e. groynes) are likely to be required during this epoch to support the seawall. Any such measures could, however, adversely impact the dunes and defences in the southern part of the bay, and this would need to be considered fully as part of any implementation.</p>	<p>Foreshore lowering along this stretch, where defences prevent natural retreat, is predicted to continue during this epoch.</p> <p>The defences along this frontage will maintain the shoreline. These defences are predicted to become increasingly vulnerable due to foreshore lowering and potentially outflanking caused by erosion of the dunes to the south of the defences, which itself is likely to be affected by the continued defences along this stretch which will limit the sediment available to feed the dunes and so put extra pressure upon the dunes to the south.</p> <p>Due to this increasing vulnerability, if not implemented in the medium term, then beach recharge, likely supported by shoreline control structures (i.e. groynes) is very likely to be required during this epoch to support the seawall. Any such measures would, however, need to consider and seek to minimise adverse impacts to the dunes and defences in the southern part of the bay</p>

Annex G.I – Concise Summary of Preferred Policy Options

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
<b>POLICY SCENARIO AREA: LUNDY</b>						
<b>7c01 – Landing Beach</b>	Hold the Line	Improve existing defences to continue protecting the only access to the rest of Lundy, through <b>hold the line</b> .	Maintain the defences to continue protecting the only access to the rest of Lundy, through <b>hold the line</b> .	Maintain the defences to continue protecting the only access to the rest of Lundy, through <b>hold the line</b> .	<p>Maintaining defences at Landing Beach will continue to result in less sediment being eroded from the backing cliffs and a slight decrease in sandbanks that form part of the Lundy Special Area of Conservation (SAC), assuming an onshore-offshore pathway for sediment.</p> <p>Potential impacts on Lundy Site of Special Scientific Interest (SSSI) and Marine Nature Reserve from improvement and maintenance of coastal defence assets.</p> <p>Minor changes in landscape in Lundy Heritage Coast and Coastal Preservation Area from improvement and maintenance of coastal defence assets.</p> <p>A Hold the Line policy may cause coastal squeeze (narrowing of the shoreline) and gradual loss of landing beach. This may see a change in conservation value of this feature of the SAC.</p> <p>Unlikely to have implications for UNESCO Biosphere Reserve.</p>	The objective of the Plan here is to continue to provide defence at Landing Beach in order to maintain access to the rest of Lundy.
<b>7c02 – Lundy (except Landing Beach)</b>	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Shrinkage of the island’s pocket beaches due to coastal squeeze (narrowing of the shoreline) as cliff erosion fails to keep pace with sea level rise. Although a natural process, there may be loss of key intertidal features of the Lundy SSSI, Marine Nature Reserve and SAC.</p> <p>Cliffs could recede by up to 10m in the south-east of the island over the long term. Depending on where this occurs, it could lead to the loss of several scheduled monuments: Marison Castle; remains of two gun batteries; Brazen Ward in the north east of Lundy; and a battery in the central western area. Potential loss of non-scheduled prehistoric features also. Loss of these features depends on where the cliffs recede in future.</p> <p>Unlikely to have implications for UNESCO Biosphere Reserve.</p>	The objective of the Plan here is to continue to allow this undefended section of coast, designated for its environmental features, to evolve naturally.
<b>POLICY SCENARIO AREA: HARTLAND POINT TO WESTWARD HO!</b>						

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7c03 – Hartland Point to Clovelly	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Sections of the South West Coast Path will need to be moved inland as they are lost to erosion. This is in line with South West Coast Path policy.</p> <p>Potential for erosion of terrestrial habitats such as heath and woodland designated as Tintagel-Marsland-Clovelly Coast SAC and Marsland to Clovelly SSSI. Policies could be developed to allow the landward movement of habitats.</p> <p>Potential change in landscape within Hartland Heritage Coast and North Devon Area of Outstanding Natural Beauty (AONB) through increased flooding and erosion.</p> <p>Potential partial loss of two Scheduled Monuments due to erosion: Gallantry Bower (medium term) and Windbury Head (long term). Potential loss of Listed Buildings near Blackchurch Rock and to the west of Clovelly, as well as a number of non-designated archaeological features. Loss of these features depends on where the cliffs recede in future.</p> <p>Unlikely to have implications for UNESCO Biosphere Reserve.</p>	The objective of the Plan here is to continue to allow this undefended section of coast, designated for its environmental features, to evolve naturally.
7c04 – Clovelly	Hold	<p>Maintain the existing seawall and breakwater to continue protecting Clovelly, through <b>hold the line</b>.</p> <p>This would be supported by continuing the annual transfer of pebbles across the harbour from west to east.</p>	<p>Maintain the defences and eventually replace, or add to the outside of, them with larger structures to continue protecting Clovelly, through <b>hold the line</b>.</p> <p>This would be supported by continuing the annual transfer of pebbles across the harbour from west to east.</p>	<p>Maintain the defences constructed in the medium term to continue protecting Clovelly, through <b>hold the line</b>.</p> <p>This would be supported by continuing the annual transfer of pebbles across the harbour from west to east.</p>	<p>Protection of homes and businesses, the harbour, listed buildings and South West Coast Path from flood and erosion risk.</p> <p>Potential change in landscape in Hartland Heritage Coast and North Devon AONB through increased size of defences.</p> <p>Unlikely to have implications for UNESCO Biosphere Reserve.</p>	<p>The objective of the Plan here is to continue to protect people, property and infrastructure at Clovelly.</p> <p>To do so will only have localised impacts on coastal processes.</p>

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7c05 – Clovelly to Westward Ho! (Seafield House)	Do Nothing	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Sections of the South West Coast Path will need to be moved inland as they are lost to erosion. This is in line with South West Coast Path policy.</p> <p>Potential loss of properties, including a number of Listed Buildings, due to erosion at Bucks Mill if alternative funds are unavailable for future defence.</p> <p>Potential loss of non-designated archaeological features along this section. Loss of these features depends on where the cliffs recede in future.</p> <p>Potential for landscape change within Hartland Heritage Coast and North Devon AONB through increased erosion, and for deteriorating coastal defence structures to become unsightly if not maintained.</p> <p>Through natural process of erosion, there may be a loss of terrestrial habitats such as heath and woodland in the Tintagel-Marsland-Clovelly Coast SAC and the Marsland to Clovelly SSSI.</p> <p>The policy will promote the geological exposures from Mermaids Pool to Rowdens Gut SSSI, which will continue to be visible. Maintenance and possible enhancement of geological features in the Marsland to Clovelly SSSI and SAC if Bucks Mill is not defended in the medium to long term.</p> <p>Unlikely to have implications for UNESCO Biosphere Reserve.</p>	<p>The objectives of the Plan here are to continue to allow this largely undefended section of coast to evolve naturally and minimise erosion risk to people and property.</p> <p>However, it is unlikely that continued defence of Bucks Mill would attract public funding from the flood and coastal defence budget.</p> <p>If alternative funds are available, there is no reason from a processes point of view not to permit defences to be retained. They would need to be replaced with much larger structures to provide adequate levels of protection in the future. However, this may be impossible to justify economically even with alternative funding in the future.</p>
<b>POLICY SCENARIO AREA: WESTWARD HO! TO SAUNTON DOWN</b>						
7c06 – Westward Ho!	Hold	Maintain and improve the existing seawall defences, replacing them with much larger structures as required, to continue protection for Westward Ho!, through <b>hold the line</b> .	Maintain the seawall defences to continue protection for Westward Ho!, through <b>hold the line</b> .	Maintain the seawall defences to continue protection for Westward Ho!, through <b>hold the line</b> .	<p>Protection of properties, community, recreational and amenity facilities from erosion and flooding (Short term).</p> <p>Protection of tourist amenities (including holiday camp, park and caravan site), promenade, Coastguard station and slipway from erosion and flooding (long term). Minor changes in landscape within North Devon AONB and Hartland Heritage Coast.</p> <p>Protection of sections of the South West Coastal Path. This policy will limit natural processes that are key to the integrity of Westward Ho! SSSI's geological features; visible exposures will remain limited, except at the western end of this section.</p> <p>There are potential effects on Northam Burrows SSSI and Braunton Burrows Nature Reserve SSSI and SAC, as continued defence at Westward Ho! limits natural processes.</p>	<p>The objective of the Plan here is to continue to protect Westward Ho! against flood and erosion risk.</p> <p>Defences would eventually need replacing with much larger structures along existing alignments.</p> <p>Defences may also need to be bolstered at the western end as the undefended cliffs towards Rock Nose erode, posing a potential risk of outflanking. This policy does not envisage constructing new defences towards Rock Nose.</p>

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7c07 – Northam Burrows	Retreat	<p>Continue to reduce flood and erosion risk for developed areas along the southern part of Northam Burrows by constructing low embankment/revetment type defences that reflect the waves power. Continue to take measures to protect the former landfill site, while allowing the pebble ridge to roll back and rotate to become more aligned with the dominant wave direction (possibly aided by recycling beach material), through <b>managed realignment</b>.</p>	<p>Continue to reduce flood and erosion risk for developed areas along the southern part of Northam Burrows by maintaining and improving embankment defences. Continue to take measures to protect the former landfill site, while allowing the pebble ridge to adapt naturally to rising sea levels, through <b>managed realignment</b>.</p>	<p>Continue to reduce flood and erosion risk for developed areas along the southern part of Northam Burrows by maintaining and improving embankment defences. Continue to take measures to protect the former landfill site, while allowing the pebble ridge to adapt naturally to rising sea levels, through <b>managed realignment</b>.</p>	<p>Protection of homes at the southern end of Northam Burrows and the former landfill site at the northern end. The Golf Course and the Surf Bay Caravan Park continue to be at risk from coastal flooding.</p> <p>Loss of part of a minor road (medium term), giving access to the northern sections of Northam Burrows, the information centre and the car park (long term) due to erosion and flooding.</p> <p>The minor road behind the pebble ridge will therefore need to be moved back as the ridge rotates. Ultimately access via the Pebble Ridge Road will be lost.</p> <p>Loss of parts of the Golf Course due to erosion. The Golf Course could be relocated elsewhere in Northam Burrows, aided by the Hold the Line policy along unit 7c08.</p> <p>Loss of large sections of the South West Coast Path due to erosion (medium to long term) and flooding. These sections will need to be moved inland in line with the South West Coast Path policy.</p> <p>Loss of a number of non-designated archaeological features located on the western half of Northam Burrows due to flooding and erosion.</p> <p>Reduction in size of the Northam Burrows SSSI as the pebble ridge rolls back (medium to long term). This may affect the Braunton Burrows SAC and would be considered through an appropriate Assessment.</p> <p>Extension of defences east from Westward Ho! would result in loss of the southernmost part of the pebble ridge.</p> <p>There would be minor changes in landscape in the North Devon AONB.</p> <p>Any construction of defences would need to be sympathetic to the AONB and support biodiversity and sustainable development policies of the Biosphere Reserve.</p>	<p>The objectives of the Plan here are to provide a sustainable long-term solution for managing flood and erosion risk to people, property and the former landfill site, and to work with the natural processes predicted to cause roll-back and rotation of the pebble ridge.</p> <p>This rotation and roll-back could be allowed to occur largely naturally although beach recycling could be used where it would help this process, e.g. by aiding the building up of the beach at the northern end of the spit, and it would not interfere significantly with the transport of sediment along the shore. The need for this would be based on continuous monitoring.</p> <p>Along the southern end of Northam Burrows, where the land rises and development has occurred, roll-back of the ridge here could be up to 150-200m.</p> <p>This will expose areas currently considered to be 'inland' to wave action. Therefore under this policy, a new low-reflective structure (e.g. earth embankment or rock revetment type defence) could be constructed perpendicular to the shoreline. This would reduce flood risk for property and infrastructure. The exact nature of the structure to be used requires more detailed investigation.</p> <p>This defence could be extended over time, depending upon the extent of ridge roll-back as sea levels rise, and based on continuous monitoring. As part of this implementation, the defences at the eastern end of Westward Ho! would need to be extended and increased as this area will become more prominent along the shoreline.</p>

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<b>7c08 – Skern Salt marsh to Appledore (west)</b>	Retreat	Maintain the existing revetment defences to continue protecting the rest of Northam Burrows and provide access to the landfill site, through <b>hold the line</b> .	Maintain and improve the revetment defences to continue protecting the rest of Northam Burrows and provide access to the landfill site, through <b>hold the line</b> .	Maintain the revetment defences, improved in the medium term, to continue protecting the rest of Northam Burrows and provide access to the landfill site, through <b>hold the line</b> .	<p>Protection of the former landfill site at Northam Burrows from flooding and erosion.</p> <p>Protection of sections of the Tarka Trail from flooding.</p> <p>Maintenance of defences provides flood protection for Appledore, Instow and the Taw-Torridge Estuary.</p> <p>Provides protection of a maximum possible area of the eastern side of Northam Burrows into which the Golf Course could move as the seawards side erodes.</p> <p>A Hold the Line policy may cause local coastal squeeze (narrowing of the shoreline) with potential loss of intertidal habitat from the Taw Torridge SSSI and possibly wider implications for the Braunton Burrows SSSI, National Nature Reserve and SAC.</p> <p>However, Hold the Line is required to support the adjacent managed realignment in policy unit 7c07 that will create a greater area of habitat to offset this loss. Needs further detailed assessment.</p> <p>Minor changes in landscape in the North Devon AONB.</p>	<p>The objective of the Plan here is to manage flood and erosion risk to people, property and the former landfill site.</p> <p>This objective supports the managed realignment in unit 7c07. The policy to Hold the Line here will provide a further 'back stop' to any flooding caused by overtopping and breaching of the pebble ridge.</p> <p>This will reduce the potential for any such events breaking through Northam Burrows and having a more significant impact on the Taw/Torridge Estuary.</p> <p>Holding the line here could also maximise the land available for adapting land use, whereas realignment would reduce the land available.</p> <p>Implementation of a Hold the Line policy here will need to consider both continuation of access to the furthest part of the pebble ridge while also allowing sediment and water to pass beneath the Skern road. This would allow sediment deposition on Northam Burrows to occur, reducing the effects of future sea level rise.</p>
<b>7c09 – Appledore</b>	Hold	Maintain and improve the various seawall/quay wall defences to continue protecting Appledore, through <b>hold the line</b> .	Maintain and further improve the various seawall/quay wall defences to continue protecting Appledore, through <b>hold the line</b> .	Maintain the various seawall/quay wall defences to continue protecting Appledore, through <b>hold the line</b> .	<p>Protection from the risk of flooding of homes and businesses, facilities for the community, recreation and tourism, roads (A386 and cycle path), shipyard and harbour infrastructure.</p> <p>Protection of sections of the Tarka Trail from flooding.</p> <p>Potential loss of salt marsh at Skern Bay due to coastal squeeze (narrowing of the shoreline), with potential impacts on Taw Torridge SSSI.</p>	<p>The objective of the Plan here is to continue to reduce the risk of flooding to people, property and infrastructure at Appledore.</p>
<b>7c10 – Appledore to Cleave Moorings, Northam</b>	Do Nothing	Allow natural estuary evolution to continue through <b>no active intervention</b> .	Allow natural estuary evolution to continue through <b>no active intervention</b> .	Allow natural estuary evolution to continue through <b>no active intervention</b> .	<p>No implications for development, historic features, conservation or land areas..</p>	<p>The objective of the Plan here is to allow the estuary to evolve naturally.</p> <p>This section is backed by steeply rising ground. A policy of No Active Intervention would result in no more assets being at risk of flooding than at present.</p>

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7c11 – Cleave Moorings, Northam and Bideford	Hold	Maintain the existing floodwall defences to continue protecting Northam and Bideford, through <b>hold the line</b> .	Maintain the existing floodwall defences to continue protecting Northam and Bideford, through <b>hold the line</b> .	Maintain the floodwall defences, eventually raising the height of the walls in response to sea level rise, to continue protecting Northam and Bideford, through <b>hold the line</b> .	<p>Protection from the risk of flooding for homes and businesses, community, recreation and tourism amenities, roads (A39, A386 and cycle path), a substation and harbour.</p> <p>A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI</p>	The objective of the Plan here is to continue to reduce flood risk for people, property and infrastructure in Northam and Bideford.
7c12 – Upper Torridge Estuary (right (east) and left (west) banks between Bideford and Weare Gifford)	N/A	<p>Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Torridge Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are required to protect infrastructure and property.</p> <p>Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.</p>	<p>Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Torridge Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are required to protect infrastructure and property.</p> <p>Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.</p>	<p>Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Torridge Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are required to protect infrastructure and property.</p> <p>Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.</p>	<p>Policies may affect isolated properties.</p> <p>Minimal loss of higher grade agricultural land beside the Estuary due to erosion. Agricultural land is at risk from flooding.</p> <p>Although outside the Taw Torridge SSSI, creation of intertidal habitat could benefit the SSSI by offsetting the loss of habitat within it. This in line with the UNESCO Biosphere Reserve policy.</p>	<p>The objectives of the Plan here are to manage flood risk to people, property and infrastructure in a sustainable way and seek opportunities to allow the estuary to adapt to the effects of climate change in as natural way as possible.</p> <p>Most defences in the upper Torridge Estuary protect low-lying areas of mainly farmland backed by steeply rising ground.</p> <p>The policy of No Active Intervention in much of this upper part of the estuary would eventually help the estuary adapt to rising sea levels and other effects of climate change. The Biosphere Reserve has also been implementing small- to medium-scale managed realignment over the last 10 years in support of this type of action.</p> <p>Properties and infrastructure have been developed in some areas, where it may be necessary to manage the realignment of the estuary by providing set-back defences. This would continue to reduce flood risk to these assets while allowing the estuary to adapt.</p> <p>It may be necessary to Hold the Line locally along short lengths of the upper estuary where realignment is impossible.</p> <p>Whether defended or undefended in the future, the evolution of the estuary will be constrained by defences or the naturally steep valley sides.</p>
7c13 – East-the-Water to Torridge Bridge (A39)	N/A	Minimise flood risk, by maintaining existing defences, through a <b>hold the line</b> policy.	Minimise flood risk, by maintaining existing defences, through a <b>hold the line</b> policy.	Minimise flood risk, by maintaining or improving existing defences, through a <b>hold the line</b> policy.	<p>Flood protection for homes and businesses, facilities for the community, recreation and tourism and roads (A39 and cycle path).</p> <p>A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI. However, along parts of this stretch, consideration could be given to controlled tidal exchange (allowing managed flooding) through the defended line onto land to the east of the main road.</p>	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure in the developed area of East-the-Water.

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<b>7c14 – Torridge Bridge (A39) to Instow</b>	Hold	Minimise flood risk, by maintaining existing defences, through a <b>hold the line</b> policy.	Minimise flood risk, by maintaining or improving existing defences, through a <b>hold the line</b> policy.	Minimise flood risk, by maintaining the improved defences, through a <b>hold the line</b> policy.	Protection of the B3233 and part of Tapeley Park from risk of flooding. A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI. Habitat creation policies in other parts of the estuary could be needed to offset this.	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure on the developed frontage between East-the-Water and Instow.
<b>7c15 – Instow</b>	Hold	Maintain the floodwall defences, eventually replacing them with larger structures, to continue to protect Instow through a <b>hold the line</b> policy.	Maintain the defences, improved in the short term, to continue to protect Instow through a <b>hold the line</b> policy.	Maintain the defences to continue to protect Instow through a <b>hold the line</b> policy.	Protection of homes and businesses, facilities for the community, recreation and tourism, Instow Conservation Area and B3233 from flooding. A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure at Instow.
<b>7c16 – Instow Dunes</b>	Hold	Undertake dune management through a <b>managed realignment</b> policy to ensure that the dunes provide a robust natural defence against the risk of flooding.	Continue dune management through a <b>managed realignment</b> policy to ensure that the dunes provide a robust natural defence against the risk of flooding. If this becomes compromised, construct a set back defence.	Continue dune management through a <b>managed realignment</b> policy to ensure that the dunes provide a robust natural defence against the risk of flooding. If this becomes compromised, construct a set back defence.	Protection of homes and businesses, facilities for the community, recreation and tourism, Instow Conservation Area and B3233 from flooding. Construction and maintenance of a set back defence in the long term could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure at Instow by pro-actively managing the dunes that provide a natural flood defence in this area. This is in support of the policy in unit 7c15. A dune/beach management plan could be developed to support this policy. This might involve extending the dunes southwards along Instow Beach and altering highway drainage.



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7c17 – Instow to Yelland	Hold	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> along parts of this stretch (dependent upon outcome of studies). Where realignment does not occur, continue to <b>hold the line</b> to protect infrastructure and property.	<b>Hold the line</b> of the defence to continue to reduce the risk of flooding.	<p>Protection of local access road, isolated houses and the South West Coast Path.</p> <p>Protection of substations at Estuary Business Park. Loss of sections of this business park in the medium term through Managed Realignment, although the extent of loss depends on where the set-back defences are, which would be determined through further detailed study.</p> <p>Potential benefits to the Taw Torridge SSSI by creating intertidal habitat in areas of Managed Realignment in the medium term.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p> <p>A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat from the SSSI.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement Managed Realignment to provide both flood storage and habitat creation opportunities to benefit the wider estuary.</p> <p>Implementing this policy could involve constructing a set-back defence and then making a breach in the existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required to assess their likely effects in isolation and cumulatively.</p> <p>The short term policy to Hold the Line would maintain existing defences while these studies are done.</p> <p>If the studies show it is inappropriate to realign defences here, then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>
7c18 – Home Farm Marsh (Yelland to Fremington)	Retreat	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate managed realignment opportunities.	Implement <b>managed realignment</b> along this stretch (dependent upon outcome of studies).	<b>Hold the line</b> of the defence.	<p>The realigned defence may impact on the Fremington geological SSSI.</p> <p>Potential benefits to the Taw Torridge SSSI through the creation of intertidal habitat in areas of managed realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat from the SSSI, especially on Home Farm Marsh.</p> <p>Protection of the old Yelland Power Station and associated ash beds from flooding as well as the major substation serving around 40,000 homes.</p> <p>Potential impacts on Yelland Stone Row Schedule Monument and a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement managed realignment to provide both flood storage and habitat creation opportunities of benefit to the wider estuary whilst continuing to reduce flood risk to people, property and infrastructure.</p> <p>Implementation of this policy could involve constructing a set-back defence and then making a breach in the existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required to assess the likely affects of this, both in isolation and cumulatively.</p> <p>The short term policy to Hold the Line would maintain existing defences while these studies are done.</p> <p>If the studies show it is inappropriate to realign defences here, then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>

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7c19 - Fremington	Hold	Maintain and improve the defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	Maintain the improved defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	Maintain the improved defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	<p>A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat from the Taw Torridge SSSI.</p> <p>Protection of homes and businesses at Fremington and Muddlebridge from flooding.</p>	The objective of the Plan in this area is to continue to reduce the risk of flooding to the developed areas that are currently defended in this area.
7c20 – Fremington to Penhill Point	Do Nothing	Allow natural estuary evolution to continue through <b>no active intervention</b> .	Allow natural estuary evolution to continue through <b>no active intervention</b> .	Allow natural estuary evolution to continue through <b>no active intervention</b> .	Damage and potential loss of isolated access roads and the Conservation Areas at Fremington to flooding.	<p>The objective of the Plan is to allow this undefended section of the estuary to continue to evolve naturally.</p> <p>This section is comprised of high ground with no assets at risk of flooding.</p>
7c21 – Penhill Point to Bickington	N/A	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate managed realignment opportunities.	Implement <b>managed realignment</b> along this stretch (dependent upon outcome of studies).	<b>Hold the line</b> of the defence.	<p>A Hold the Line policy in the long-term could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI.</p> <p>Potential implications for the Tarka Trail depend on how realignment in this area is implemented. Consideration could be given to controlled tidal exchange through the defended line onto land to the west of Tarka Trail, between Penhill Point and the Western Bypass Road Bridge.</p>	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure at Bickington whilst seeking opportunities to create habitat.
7c22 – Bickington to A39	N/A	Maintain and improve the defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	Maintain the improved defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	Maintain the improved defences to continue protection against flood risk to property and infrastructure, through <b>hold the line</b> .	<p>Protection of homes and businesses and community, recreation and tourism amenities from flooding.</p> <p>A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI.</p> <p>Protection of Conservation Areas at Bickington from flooding.</p>	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure at Bickington.
7c23 – Upper Taw Estuary (right (east) and left (west) banks between A39 to tidal limit near Bishops Tawton)	N/A	Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Taw Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are	Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Taw Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are	Allow natural estuary evolution to continue through <b>no active intervention</b> along much of the upper Taw Estuary, but implement <b>managed realignment</b> or <b>hold the line</b> locally where defences are	<p>Policies may affect isolated properties.</p> <p>Minimal loss to erosion of higher grade agricultural land by the estuary. Agricultural land is at risk from flooding.</p> <p>Potential benefits to the Taw Torridge SSSI by creating intertidal habitat in areas of Managed Realignment or No Active Intervention.</p>	<p>The objective of the Plan here is to manage flood risk to people, property and infrastructure in a sustainable way, while seeking opportunities to allow the estuary to adapt to climate change in as natural way as possible.</p> <p>Most defences in the upper Taw Estuary protect low-lying areas of mainly farmland backed by steeply-rising ground.</p> <p>The policy of No Active Intervention in much of this upper</p>

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		required to protect the railway line.  Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.	required to protect the railway line.  Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.	required to protect the railway line.  Exact locations suitable for managed realignment will be informed by the ongoing Taw-Torridge Estuary strategy study.	Potential loss of intertidal habitat from the SSSI due to coastal squeeze (narrowing of the shoreline) where a Hold the Line policy is implemented.	part of the estuary, particularly along the east bank, would eventually see the estuary able to adapt to rising sea levels and other results of climate change.  Where properties and infrastructure – particularly the railway line – have been developed, it may be necessary to manage the estuary realignment by providing set-back defences to continue to reduce flood risk to these assets.  Holding the Line may be required along short lengths of the upper estuary where realignment is impossible.
<b>7c24 – A39 to West Ashford (Barnstaple)</b>	N/A	Maintain the embankment defences, and eventually replace some with larger embankments, to continue protection for Barnstaple, through <b>hold the line</b> .	Maintain and further replace the embankment defences to continue protection for Barnstaple, through <b>hold the line</b> .	Maintain the embankment defences to continue protection for Barnstaple, through <b>hold the line</b> .	Protection from flood risk for: homes and businesses; community, recreation and tourism facilities at Barnstaple, Pottington, Pilton, Sticklepath; sections of the A361, A39 and A386 and some access roads; the South West Coast Path; the Barnstaple to Exeter railway line; and the electricity sub-stations at Barnstaple serving a total of about 36,000 homes and businesses.  Ashford Sewage Works would be protected from flooding. Protection of Conservation Areas and a Schedule Monument, Barnstaple Castle, from flooding.  A Hold the Line policy could cause coastal squeeze (narrowing of the shoreline) with loss of intertidal habitat from the Taw Torridge SSSI.  Consideration could, however, be given to controlled tidal exchange (managed flooding) through the defended line onto low-lying land between the defence line and the A361.	The objective of the Plan here is to continue to reduce flood risk to people, property and infrastructure at Barnstaple.

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7c25 – West Ashford to Braunton (east bank of River Caen)	Hold	Continue to maintain existing defences under a <b>hold the line</b> policy. Investigate managed realignment opportunities.	Implement <b>managed realignment</b> along parts of this stretch (dependent upon outcome of studies). Continue to <b>hold the line</b> of the recently realigned defence at RAF Chivenor.	<b>Hold the line</b> of the realigned defences.	<p>Parts of the airfield at RMB Chivenor and its infrastructure, which includes a Royal Marine base, as well as agricultural land, could be lost through realignment in the medium term. Exactly how much would depend on where the defences were realigned, which would be determined by future detailed studies.</p> <p>Potential benefits to the Taw Torridge SSSI through the creation of intertidal habitat in areas of Managed Realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat from the SSSI. Flood risk to most properties in this area would continue to be reduced by providing realigned defences.</p> <p>Realigned defences would continue to reduce flood risk to homes and businesses and community, recreation and tourism facilities at Braunton, Wrafton and Chivenor.</p> <p>Protection of the South West Coast Path along much of this section, though some parts may need to be relocated, depending upon location of any future realignment.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement Managed Realignment to provide both flood storage and habitat creation opportunities of benefit to the wider estuary.</p> <p>The Ministry of Defence has already realigned defences on the landward side of the main runway at RMB Chivenor.</p> <p>Parts of the airfield at RMB Chivenor and agricultural land would be lost as a result of this and further realignment in the medium term.</p> <p>There is potential for further realignment on the western side of this section, along the east bank of the River Caen.</p> <p>Implementation of this policy could involve constructing a set-back defence and then making a breach in existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required to assess its likely effects, both in isolation and cumulatively.</p> <p>The short-term policy to Hold the Line would maintain the existing defences while these studies are done.</p> <p>If the studies show it is inappropriate to realign defences here, then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>

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7c26 – Braunton to Horsey Island (west bank of River Caen)	Hold / Observe & Monitor	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> along this stretch (dependent upon outcome of studies).	<b>Hold the line</b> of the realigned defence.	<p>Protection from risk of flooding of homes and businesses and community, recreation and tourism facilities at Braunton.</p> <p>Protection from risk of flooding of the A361 and other roads and the cycle path at Braunton.</p> <p>Protection from flood risk of part of the South West Coast Path.</p> <p>Locally and nationally important sites at Braunton Great Field and Braunton Conservation Area are at risk from flooding in the medium term. Potentially adverse impacts on the Great Sea Bank by implementing realignment.</p> <p>Potential benefits to the Taw Torridge SSSI by creating intertidal habitat in areas of Managed Realignment in the medium term.</p> <p>A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat from the SSSI.</p> <p>Change in landscape on the Heritage Coast.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement Managed Realignment to provide both flood storage and habitat creation opportunities of benefit to the wider estuary.</p> <p>Implementation of this policy could involve constructing a set-back defence and then making a breach in the existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required to assess its likely effects in isolation and cumulatively.</p> <p>The short term policy to Hold the Line would maintain existing defences while these studies are made.</p> <p>If the studies show that realignment is inappropriate here then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>
7c27 – Horsey Island	Hold	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> along this stretch (dependent upon outcome of studies).	<b>hold the line</b> of the realigned defence.	<p>Protection of an access road.</p> <p>Potential benefits to the Taw Torridge SSSI by creating of intertidal habitat in areas of managed realignment in the medium term, although this could cause permanent loss of freshwater habitats in Greenaways and Freshways Marshes SSSI and Braunton Swanpool SSSI. Interim preparatory measures could be used, such as regulated tidal exchange (managed tidal flooding) over Horsey Island.</p> <p>A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and eventual loss of intertidal habitat from the SSSI.</p> <p>Change in landscape on the Heritage Coast.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement Managed Realignment to provide both flood storage and habitat creation opportunities of benefit to the wider estuary.</p> <p>This policy supports the policies of the UNESCO Biosphere Reserve.</p> <p>Implementation of this policy could involve constructing a set-back defence and then making a breach in the existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required to assess its likely effects in isolation and cumulatively.</p> <p>The short term policy to Hold the Line would maintain existing defences while these studies are made.</p> <p>If the studies show it is inappropriate to realign the defences, then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>

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7c28 – Horsey Island to Crow Point	Observe & Monitor	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> along this stretch (dependent upon outcome of studies).	<b>Hold the line</b> of the realigned defence.	<p>Protection of tourism infrastructure through Hold the Line policy.</p> <p>Potential benefits to the Taw Torridge SSSI by creating intertidal habitat in areas of managed realignment in the medium term, although this could cause permanent loss of freshwater habitats from Greenaways and Freshways Marshes SSSI and Braunton Swanpool SSSI. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and eventual loss of intertidal habitat from the SSSI.</p> <p>Change in landscape in North Devon AONB and Heritage Coast.</p> <p>Potential impact on non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objective of the Plan here is to investigate and, if appropriate, implement managed realignment to provide both flood storage and habitat creation opportunities of benefit to the wider estuary.</p> <p>Implementation of this policy could involve constructing a set-back defence and then making a breach in the existing defences. This could occur along most or part of this section.</p> <p>Any areas not subject to realignment would be maintained, and embankments eventually replaced with much larger structures along existing alignments.</p> <p>However, the impact of realigning defences is uncertain. Much more detailed study is required in order to assess the likely effects of this both in isolation and cumulatively.</p> <p>The short-term policy to Hold the Line would maintain the existing defences while these studies are made.</p> <p>If the studies show it is inappropriate to realign the defences, then the existing defences would need to be maintained and eventually replaced with much larger structures.</p>
7c29 – Crow Point & Crow Neck	Observe & Monitor	Continue to monitor the spit, under a policy of <b>managed realignment</b> , while investigating the importance of the spit in terms of providing protection to the inner estuary. If necessary, undertake beach replenishment to maintain this feature and/or repair any breaches, otherwise limited or no intervention is to occur.	Continue to monitor the spit, under a policy of <b>managed realignment</b> , and undertake works as required following the investigations in the short term. If studies show this area is not required for defence benefit of the inner estuary, then limited or no intervention is to occur.	Continue to monitor the spit, under a policy of <b>managed realignment</b> , and undertake works as required following the investigations in the short term. If studies show this area is not required for defence benefit of the inner estuary, then limited or no intervention is to occur.	<p>The proposed coastal protection measures may promote alternative processes that could affect the Braunton Burrows SSSI, Nature Reserve and SAC, as well as the UNESCO Biosphere Reserve's dunes.</p> <p>Natural processes will continue to develop Braunton Burrows SSSI, Nature Reserve and SAC, as well as the UNESCO Biosphere Reserve's dunes.</p> <p>Change in landscape in North Devon AONB and Heritage Coast.</p> <p>Potential impacts on a number of non-designated archaeological features.</p>	<p>The objective of the Plan is to work with natural processes in this area and only intervene if necessary to benefit the wider inner estuary area.</p> <p>If it is found to be important to maintain the spit in the medium to long term for the benefit of other parts of the inner estuary, then this could be most sustainably achieved by working with natural processes as far as possible. This could, however, ultimately be constrained with a secondary defence line.</p> <p>If found not to be important for the protection of the inner estuary, then little or no intervention would occur along the spit.</p>

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7c30 – Braunton Burrows	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Natural processes will continue to develop Braunton Burrows SSSI, Nature Reserve and SAC as well as dunes in the UNESCO Biosphere Reserve.</p> <p>If the coastal defence structures are not maintained, then properties at Saunton would face increased flood risk and eventual loss due to erosion in the medium to long term.</p> <p>Support of Biosphere Reserve natural processes and provides protection of North Devon AONB and Heritage Coast from development of defences.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.</p>	<p>The objective of the Plan is to allow this predominantly undefended coast to continue to evolve naturally in order to conserve its internationally-designated features.</p> <p>It is recognised that the short defences at the northern end of this section protect properties at Saunton against flood and erosion risk. However, it is unlikely that these defences would attract public funds from the flood and coastal defence budget for maintenance and improvement.</p> <p>If alternative funds are available, there is no reason – from a processes point of view – why these defences could not be retained, although they would need to be much larger in the future to provide adequate levels of protection. This may be impossible to justify economically, even using alternative funds in the future.</p>
7c31 – Saunton Down	Do Nothing	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion and maintain visitor access.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Loss of tourism infrastructure at Saunton Sands.</p> <p>Continued erosion will retain the geological exposures of the Saunton to Baggy Point SSSI.</p> <p>Support of Biosphere Reserve natural processes and protection of North Devon AONB and Heritage Coast from development of defences.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon location and extent of any future erosion.</p>	<p>The objective of the Plan here is to continue to allow the natural evolution of this undefended section of coast, which is designated for its environmental features.</p>
<b>POLICY SCENARIO AREA: SAUNTON DOWN TO BAGGY POINT (CROYDE BAY)</b>						
7c32 – Croyde Sands	Observe & Monitor	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Homes, roads, amenities and infrastructure are at risk from fluvial flooding at Croyde village.</p> <p>Continued erosion will retain the geological exposures of the Saunton to Baggy Point SSSI.</p> <p>Support of Biosphere Reserve natural processes and protects North Devon AONB and Heritage Coast from development of defences.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.</p>	<p>The objective of the Plan here is to continue to allow the natural evolution of this undefended section of coast, which is designated for its environmental features.</p> <p>The dunes are managed to deal with the erosion caused by recreation, and the channel that discharges to the sea is also managed. These management activities could continue as no intervention for the purpose of coastal defence would occur under this policy.</p>

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<b>7c33 – Middleborough Hill (Croyde Bay north)</b>	Hold	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Loss of some properties north of Croyde to erosion could occur if defences are not maintained.  Continued erosion will retain the geological exposures of the Saunton to Baggy Point SSSI.  Potential change to the landscape of the North Devon AONB and Heritage Coast as deteriorating coastal defence structures become unsightly.  Potential impacts on a number of non-designated archaeological features, depending upon location and extent of any future erosion.	The objectives of the Plan here are to allow the natural evolution of this section of coast while managing the risk of flooding and erosion to people and property.  There are short lengths of defence at the northern end of Croyde Bay.  It is unlikely that these would attract public funds from the flood and coastal defence budget for maintenance and improvement.  If alternative funds are available, there is no reason – from a processes point of view – why these defences could not be retained, although they would need to be replaced in the short term with much larger structures to provide adequate levels of protection. This may be impossible to justify economically, even with alternative funds in the future.
<b>7c34 – Middleborough Hill (Croyde Bay north) to Baggy Point</b>	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Loss of small amounts of Grade 2 and 3 agricultural land from erosion in the long term.  Continued erosion will retain the geological exposures of the Saunton to Baggy Point SSSI.  Support of Biosphere Reserve natural processes and protection of North Devon AONB and Heritage Coast from development of defences.  Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.	The objective of the Plan here is to continue to allow natural evolution of this undefended section of coast, which is designated for its environmental features.
<b>POLICY SCENARIO AREA: BAGGY POINT TO MORTE POINT (WOOLACOMBE BAY)</b>						
<b>7c35 – Baggy Point to Napps Cliff (Putsborough)</b>	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, historic features, conservation or land areas.  Continued erosion will retain the geological exposures of the Saunton to Baggy Point SSSI.	The objective of the Plan here is to continue to allow the natural evolution of this undefended section of coast, which is designated for its environmental features.



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<b>7c36 – Putsborough Sands and Vention</b>	Hold	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Loss of the caravan park at Putsborough Sands, slipway and sections of the South West Coast Path (long term).</p> <p>Potential loss of isolated properties due to erosion (medium to long term) if defences are not maintained. Protection of North Devon AONB and Heritage Coast from development of defences.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.</p>	<p>The objectives of the Plan here are to allow the natural evolution of this section of coast while managing flood and erosion risk to people and property.</p> <p>Short defences at the south end of Morte Bay provide local protection against flood and erosion risk to people, property and infrastructure at Vention.</p> <p>It is unlikely that these defences would attract public funds from the flood and coastal defence budget for maintenance and improvement.</p> <p>If alternative funds are available, there is no reason – from a processes point of view – why they could not be retained, although defences here would only be acceptable if they continue to be linear type (seawalls and revetments) and are acceptable in landscape and biodiversity terms.</p> <p>Groynes or other shoreline control structures would interrupt sediment transport and affect other parts of Morte Bay, so they would not be supported by the Plan.</p> <p>If alternative funds are available, these defences would need to be replaced in the short term with much larger structures to provide adequate levels of protection.</p> <p>Retention of the defences could become technically more difficult as they would exacerbate narrowing and loss of fronting beach as sea levels rise; they could also become outflanked if undefended dunes to the north erode.</p> <p>Therefore this may be impossible to justify economically, even using alternative funds in the future.</p>
<b>7c37 – Vention to Woolacombe Beach (Woolacombe Sands)</b>	Do Nothing	<p>Allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>No implications for development, historic environment or land areas.</p> <p>Potential loss of locally important habitats from the Woolacombe Down County Wildlife Sites.</p> <p>Protection of North Devon AONB and Heritage Coast from development of defences.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.</p>	<p>The objective of the Plan here is to continue to allow the natural evolution of this undefended section of coast, which is designated for its environmental features.</p> <p>Current dune management could continue to deal with local erosion caused by recreation.</p>

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7c38 – Woolacombe Beach	Observe & Monitor	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Homes, roads, amenities, the Conservation Area and infrastructure at Woolacombe village are at risk from fluvial flooding.  Protection of Mill Rock SSSI from development of defences.  Protection of North Devon AONB and Heritage Coast from development of defences.  Potential impacts on a number of non-designated archaeological features, depending upon extent of any future erosion that may occur.	The objectives of the Plan here are to allow this section of undefended coast to evolve naturally, while managing flood and erosion risk to people and property by developing ways of adapting to the risk.
7c39 – Woolacombe to Morte Point	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, historic features, conservation or land areas.  Protection of Barricane Beach SSSI and Morte Point SSSI from development of defences.  Protection of North Devon AONB and Heritage Coast from development of defences.  Potential impacts on a number of non-designated archaeological features, depending upon location and extent of any future erosion.	The objectives of the Plan here are to allow this section of undefended coast to evolve naturally, while managing flood and erosion risk to people and property by developing ways of adapting to the risk.
<b>POLICY SCENARIO AREA: MORTE POINT TO FORELAND POINT</b>						
7d01 – Morte Point to Lee (west)	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, conservation or land areas.  Protection of North Devon AONB and Heritage Coast from development of defences.  Potential impacts on a number of non-designated archaeological features, including Bull Point Lighthouse, depending upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d02 – Lee	Hold	Maintain the existing defences to continue protecting Lee, through <b>hold the line</b> .	Maintain and improve the defences to continue protecting Lee, through <b>hold the line</b> .	Maintain the improved defences to continue protecting Lee, through <b>hold the line</b> .	Homes, roads, amenities and infrastructure at Lee village are protected against the risk of coastal flooding and erosion but are at risk from fluvial flooding.  Potential for defences to impact on County Wildlife Site, North Devon AONB and Heritage Coast.	The objective of the Plan here is to continue to protect people, property and infrastructure at Lee.  To do so will only have local effects on coastal processes.
7d03 – Lee (east) to Ilfracombe (west)	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, historic features, conservation or land areas.  Protection of North Devon AONB and Heritage Coast from development of defences.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.

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7d04 – Ilfracombe	Hold	Maintain the existing seawall and breakwater defences to continue protecting Ilfracombe, through <b>hold the line</b> . Localised <b>Advance the Line</b> will be used in Ilfracombe Harbour as part of plans to re-develop this area would also achieve the aim of the plan.	Maintain the defences, eventually replacing them with larger structures, to continue protecting Ilfracombe, through <b>hold the line</b> .	Maintain the defences, improved in the medium term, to continue protecting Ilfracombe, through <b>hold the line</b> .	Protection from flood risk for homes, roads, amenities, Conservation Area and infrastructure at Ilfracombe.  Potential for defences to affect Conservation Area.  Protection of harbour, amenities and beach width due to erosion (long term).	The objective of the Plan here is to continue protecting people, property and infrastructure at Ilfracombe.  To do so will only have local impacts on coastal processes.
7d05 – Ilfracombe (east – Larkstone Beach) to Hele Beach (west)	Do Nothing/ Hold at Hillsborough	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Protection of Hele Samsons and Combe Martin Bay SSSI from development of defences.  Protection of North Devon AONB and Heritage Coast from development of defences.  Potential loss of terrestrial habitat on the coast at Hillsborough Local Nature Reserve. Potential loss of parts of the Hillsborough Promontory Fort Scheduled Monument. Loss of these features depends upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d06 – Hele Beach	Hold	Maintain the existing seawall defences to continue protecting the A399, through <b>hold the line</b> .	Maintain the seawall defences, eventually replacing them with larger structures, to continue protecting the A399, through <b>hold the line</b> .	Maintain the defences which were improved in the medium term, to continue protecting the A399, through <b>hold the line</b> .	Protection of homes, roads, amenities and infrastructure at Hele from flood risk.  This policy will limit erosion of Hele Samsons and Combe Martin Bay SSSIs' geological features, thereby limiting their visible exposure.  Potential loss of beach volume due to coastal squeeze (narrowing of the shoreline) against coastal defence structures.  Potential for defences to affect North Devon AONB and Heritage Coast.	The objective of the Plan here is to continue protecting people, property and infrastructure at Hele.  To do so will only have local effects on coastal processes.
7d07 – Hele Beach (east) to Watermouth Slipway	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Minor loss of the South West Coast Path due to erosion and flooding. It would need to be moved in line with the South West Coast Path policy.  Potential impacts on a number of non-designated archaeological features, depending upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.

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7d08 – Watermouth Slipway	Hold	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Protection from flood risk for the holiday park, caravan site and camp site at Watermouth Cove, if alternative funds are available.  Potential for defences, if retained, to affect North Devon AONB and Heritage Coast.	The objectives of the Plan here are to allow the natural evolution of this section of coast while managing flood risk to people and property.  Short lengths of structures that also provide a defence function provide local protection against flood risk to people, property and infrastructure at Watermouth Slipway.  It is unlikely that these defences would attract public funds from the flood and coastal defence budget for maintenance and improvement.  If alternative funds are available, there is no reason – from a processes point of view – why they could not be retained.
7d09 – Watermouth Slipway to Combe Martin	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, conservation or land areas.  Protection of Hele Samsons and Combe Martin Bay SSSI from development of defences.  Protection of North Devon AONB and Heritage Coast from development of defences.  Potential impacts on a number of non-designated archaeological features, depending upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d10 – Combe Martin	Hold	Maintain the existing seawall defences to continue protecting Combe Martin, through <b>hold the line</b> .	Maintain the defences, eventually replacing them with larger structures, to continue protecting Combe Martin, through <b>hold the line</b> .	Maintain the defences, improved in the medium term, to continue protecting Combe Martin, through <b>hold the line</b> .	Protection of community, recreational and amenity facilities from erosion. Reduction of beach width here due to erosion (long term).  Protection of homes, roads, amenities and infrastructure from flood risk.  Potential impact on Hele Samsons and Combe Martin Bay SSSI from development of defences.  Protection of Exmoor National Park from development of defences.	The objective of the Plan here is to continue protecting people, property and infrastructure at Combe Martin, which will only have local effects on coastal processes.

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7d11 – Combe Martin to Lynmouth	Do Nothing	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.  If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development or land areas.  Protection of Exmoor National Park from development of defences.  Potential loss of terrestrial habitat due to natural processes at West Exmoor Coast and Woods SSSI, Exmoor Coastal Heaths SSSI and Exmoor Heath and Coast SAC.  Potential loss of a number Scheduled Monuments, Listed Buildings and non-designated archaeological features. Loss of these features depends upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this predominantly undefended section of coast to evolve naturally.  It is unlikely that continued defence of Lee Bay would attract public funding from the flood and coastal defence budget.  However, if alternative funds are available, there is no reason from a processes point of view not to permit defences to be retained. They would need to be replaced with much larger structures to provide adequate levels of protection in the future. However, this may be impossible to justify economically even with alternative funding in the future.
7d12 – Lynmouth	Hold	Maintain the existing seawall defences to continue protecting Lynmouth, through <b>hold the line</b> .	Maintain the seawall defences, eventually replacing them with larger structures, to continue protecting Lynmouth, through <b>hold the line</b> .	Maintain the defences, improved in the medium term, to continue protecting Lynmouth, through <b>hold the line</b> .	Protection of homes, local amenities and tourism infrastructure from flooding.  Loss of beach width due to coastal squeeze (narrowing of the shoreline) against defence assets.  Potential impacts on Exmoor Coastal Heaths SSSI and Exmoor Heath and Coast SAC	The objective of the Plan here is to continue protecting people, property and infrastructure at Lynmouth, which will only have local effects on coastal processes.
7d13 – Lynmouth to Foreland Point	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development or land areas.  Potential loss of terrestrial habitat due to natural processes at Exmoor Coastal Heaths SSSI and Exmoor Heath and Coast SAC.  Potential loss of a number Scheduled Monuments and the Listed Building of Foreland Lighthouse. Loss of these features depends upon location and extent of any future erosion.  Protection of Exmoor National Park from development of defences	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
<b>POLICY SCENARIO AREA: FORELAND POINT TO HURLSTONE POINT</b>						
7d14 – Foreland Point to Gore Point	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development or land areas.  Potential loss of terrestrial habitat due to natural processes at Exmoor Coastal Heaths SSSI and Exmoor Heath and Coast SAC, Glenthorne SSSI, and Culbone Woods County Wildlife Site.  Potential loss of a number Scheduled Monuments and Listed Buildings. Loss of these features depends upon location and extent of any future erosion.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7d15 – Gore Point to Porlock Weir	Observe & Monitor	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>No implications for development, historic features, or land areas.</p> <p>The impact of natural processes on Porlock Ridge and Salt Marsh SSSI is unclear. Further study and monitoring is required.</p>	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d16 – Porlock Weir	Hold	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of flooding and erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Protection of homes, tourism facilities, listed buildings and local infrastructure at Porlock Weir in the short to medium term. In the medium and long term, these assets would be at risk of flooding and erosion if alternative funds are not available to maintain the defences.</p> <p>The impact of natural processes on Porlock Ridge and Salt Marsh SSSI is unclear. Further study and monitoring is required.</p> <p>Protection of the Heritage Coast from development of defences.</p>	<p>The objectives of the Plan here are to allow this section of coast to evolve naturally in the long term, while managing flood and erosion risk to people and property in the short to medium term, either by continued defence or by developing ways of adapting to the risk.</p> <p>It is unlikely that continued defence of Porlock Weir would attract public funding from the flood and coastal defence budget in the medium to long term. Defences at Porlock Weir would need to withstand the increased exposure to wave action that would follow as the adjacent areas retreat when sea level rises, making this area more prominent along the shoreline.</p> <p>This would make it technically more difficult to sustain defences and is unlikely to be economically justifiable.</p> <p>The existing defences would be maintained for as long as technically possible if alternative funds are available for this purpose, although even this may become unsustainable in the medium to long term.</p> <p>This would allow ways of adapting to flood risk to be developed and implemented if continued defence here does not occur.</p>
7d17 – Porlock Weir to Hurlstone Point	Retreat	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Erosion of the gravel barrier is not predicted to affect local infrastructure as the flood risk here is from fluvial, not tidal, sources.</p> <p>The gravel ridge will continue to roll back, with the associated geomorphological change to the Porlock Ridge and Salt Marsh SSSI.</p> <p>Loss of a number of Scheduled Monuments located in the low-lying flood plain as shoreline moves landwards.</p>	<p>The objectives of the Plan here are to allow this section of coast to evolve naturally, while managing flood risk to people and property by developing ways of adapting to the risk.</p> <p>This is in line with established policy in this area implemented by the National Trust and the Environment Agency, who are currently investigating how to mitigate future flood risk through land use change as part of a separate Defra funded study.</p>
<b>POLICY SCENARIO AREA: HURLSTONE POINT TO HINKLEY POINT</b>						

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		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7d18 – Hurlstone Point to Minehead (west)	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>No implications for development, historic features, conservation or land areas.</p> <p>Potential loss of terrestrial habitat due to natural processes at Exmoor Coastal Heaths SSSI and Exmoor Heath and Coast SAC.</p>	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d19 – Minehead	Hold	Maintain and improve the existing defences to continue to provide protection to Minehead, through a <b>hold the line</b> policy.	Maintain and further improve the existing defences to continue protection for Minehead, through a <b>hold the line</b> policy.	Maintain and further improve the existing defences to continue protection for Minehead, through a <b>hold the line</b> policy.	<p>Protection from flooding for homes, roads, railways, amenities and tourism infrastructure. Protection from erosion of the harbour, places of worship, part of Quay Street, the esplanade, slipway and some seafront properties.</p> <p>Protection of the West Somerset Coastal Path from flooding along low-lying sections.</p> <p>Potential for defences to affect the Heritage Coast.</p>	<p>The objective of the Plan here is to continue to protect people, property and infrastructure at Minehead.</p> <p>This is likely to continue to affect down-drift areas further east of Minehead by reducing sediment supply to those areas.</p>
7d20 – The Warren (Minehead Golf Course)	Observe & Monitor	Continue to provide protection by replacing and maintaining embankment defences along existing alignment, possibly supported by beach recycling and replenishment, under a policy of <b>hold the line</b> . Investigate and construct a secondary defence embankment inland to protect Minehead against flood risk.	Continue to provide protection by maintaining embankment defences along existing alignment, possibly supported by beach recycling and replenishment, under a policy of <b>hold the line</b> . Maintain the secondary defence embankment inland to protect Minehead against flood risk.	As it becomes unsustainable to maintain defence along the existing alignment, move to a policy of <b>managed realignment</b> , whereby the secondary defence line becomes the primary defence line.	<p>Loss of parts of the golf course due to realignment, although this depends on where the realigned defences are sited.</p> <p>The West Somerset Coastal Path would need to be moved inland as part of any realignment as the existing route would be lost.</p>	<p>The objective of the Plan here is to protect Minehead against flood risk from this area in a sustainable way and working with natural processes as far as possible.</p> <p>This area provides a headland control point to the evolution of Minehead Bay, but already experiences significant erosion which will only increase as sea levels rise.</p> <p>Too reduce the risk of ‘back door’ flooding to Minehead from overtopping or even breaching in this area, a secondary defence embankment should be constructed in the short term.</p> <p>This area is underlain by cobble/shingle deposits. Managed Realignment in the long term – likely back to the secondary defence line constructed in the short term – could then allow erosion of the cobble/shingle.</p> <p>This additional shoreline sediment could benefit this and down-drift frontages. However, further detailed investigation of this potential is required in the short term.</p> <p>The realigned defence position would be maintained as the primary defence line in the long term. This is thought likely to benefit the Minehead frontage by retaining this area to help control the evolution of the frontage.</p>

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7d21 – Dunster Beach	Observe & Monitor	Continue to provide protection through beach management under a policy of <b>hold the line</b> . Investigate and construct a secondary defence embankment inland to protect Minehead against flood risk.	Continue to provide protection through beach management under a policy of <b>hold the line</b> . Maintain the secondary defence embankment inland to protect Minehead against flood risk.	As it becomes unsustainable to maintain defence along the existing alignment, move to a policy of <b>managed realignment</b> , whereby the secondary defence line becomes the primary defence line.	<p>Depending on the location of the realigned defences, homes, roads, the West Somerset Railway and associated facilities and community and tourist infrastructure may face increased flood risk.</p> <p>Protection of Dunster Castle Conservation Area from flooding.</p> <p>Dunster Park and Heathlands SSSI is not at risk from flooding or erosion.</p> <p>Benefit of creating intertidal habitat to offset coastal squeeze (narrowing of the shoreline) occurring along the coast in the medium term. Potential loss of intertidal habitat in the long term due to coastal squeeze (narrowing of the shoreline).</p> <p>The West Somerset Coastal Path would need to be moved inland as part of any realignment as its existing route would be lost.</p> <p>Potential loss of a number of non-designated archaeological features, depending upon extent of realignment; this would be determined by further detailed study.</p>	<p>The objective of the Plan here is to protect Minehead against flood risk from this area in a sustainable way, working with natural processes as far as possible.</p> <p>Currently private defences in the form of groynes and beach management retain a fairly healthy beach here but it remains susceptible to overtopping that floods the low-lying hinterland.</p> <p>This poses a risk of ‘back door’ flooding to Minehead that could be reduced by constructing a secondary defence embankment in the short term.</p> <p>This could be seaward of the West Somerset Railway in order to preserve the line, as along the coast to the east. However, a more detailed investigation is required into exactly where the realigned position should be.</p> <p>Private management activities on Dunster Beach would be permitted to continue under this policy. However these are likely to become unsustainable in the medium to long term as sea levels rise and the beach attempts to roll back landwards.</p> <p>As this occurs, the secondary defence embankment could become the primary defence line and may need to be armoured in the future as a result.</p>
7d22 – Dunster Beach (east) to Ker Moor	Observe & Monitor	Investigate and implement construction of set-back defence embankment under a policy of <b>managed realignment</b> .	<b>Hold the line</b> of the realigned defence through continued maintenance.	<b>Hold the line</b> of the realigned defence through continued maintenance and improvement.	<p>Dependent on the location of the realigned defences, West Somerset Railway and associated facilities may face increased flood risk.</p> <p>Benefit of creating intertidal habitat to offset coastal squeeze (narrowing of the shoreline) along the coast in the short term.</p> <p>Potential loss of intertidal habitat in the medium to long term due to coastal squeeze (narrowing of the shoreline).</p> <p>Potential loss of a number of non-designated archaeological features, depending upon extent of realignment; this would be determined by further detailed study.</p>	<p>The objective of the Plan here is to protect Minehead against flood risk from this area in a sustainable way, working with natural processes as far as possible.</p> <p>This section is currently undefended as it’s only fronted by a shingle ridge that is likely to roll back landwards as sea levels rise. This would increase flood risk to the low-lying hinterland.</p> <p>Along the eastern part of this frontage in particular, the West Somerset Railway is very close to the shoreline and would be vulnerable in the short term.</p> <p>A set-back defence embankment, possibly armoured in parts, could be constructed seawards of the railway in the short term and then maintained.</p> <p>This would help preserve the line and support like policies along the coast to east and west.</p> <p>Defence here could also reduce the risk of outflanking to the recently constructed defences at Blue Anchor.</p>



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7d23 – Blue Anchor	Hold	Maintain the existing seawall and rock revetment defences, and replace defences at the eastern end near the Blue Anchor Hotel. Extend them a little to the east, to continue protecting people, property and the B3191 from flood risk, through <b>hold the line</b> .	Maintain the defences to continue protection against flood and erosion risk, through <b>hold the line</b> .	Allow natural coastal evolution to occur by moving towards a policy of <b>no active intervention</b> , with implementation of local <b>managed realignment</b> if necessary to protect the railway.	<p>Protection from flooding and erosion for homes, roads, the West Somerset Railway and associated facilities, and community and tourism infrastructure. However in the long term these assets, including the B3191, will become at risk.</p> <p>This policy will limit natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby limiting the visible exposures. However in very long term, the move towards No Active Intervention would reduce this impact.</p> <p>Loss of a number of non-designated archaeological features once policy moves to No Active Intervention.</p>	<p>The objective of the Plan here is to protect Blue Anchor against flood and erosion risk as long as it's economically sustainable.</p> <p>In the short term the recently constructed defences at Blue Anchor would continue to be maintained.</p> <p>At the eastern end of this section, new defences – likely to be rock armour – would have to be constructed to replace older defences.</p> <p>This is needed to reduce the risk of outflanking to the road here through continued cliff erosion. These new defences are likely to have to extend eastwards a short way.</p> <p>In the long term, much larger defences would be required to replace the existing ones and would be unlikely to attract public funds in the future.</p> <p>Also, alternative routes to the B3191 are readily available to link Blue Anchor and Chapel Cleeve. Further defence for this purpose is unlikely to be justified.</p> <p>Therefore in the long term there would be a move towards No Active Intervention here.</p> <p>At the western end, local Managed Realignment could occur to protect the railway as it turns inland. This would only be justified in support of policies in adjacent sections to the west if the railway is also protected in those areas – something that's envisaged as part of this assessment. If this were not the case, then this part would also be subject to No Active Intervention.</p>
7d24 – Blue Anchor to Watchet	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>This policy will allow continuation of natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby maintaining the visible exposures.</p> <p>Erosion reducing the extent of the County Wildlife Site (CWS) at the Blue Anchor Hotel Field, Cridlands Corpse, Blue Anchor. Though there would be protection of sections of the CWS at Blue Anchor from erosion.</p> <p>Potential loss of parts of Daw Castle Scheduled Monument and a number of non-designated archaeological sites. Loss of these features depends upon where erosion occurs in the future.</p> <p>Loss of Grade 3 agricultural land to flooding and erosion.</p>	<p>The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.</p>

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		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7d25 – Watchet to Doniford	Hold	Maintain the existing seawall and breakwater defences, with eventual replacement of some defences with larger structures, to continue protection against flood and erosion risk, through <b>hold the line</b> .	Maintain the defences, eventually replacing those not replaced in short term with larger structures, to continue protection against flood and erosion risk, through <b>hold the line</b> .	Maintain the defences to continue protection against flood and erosion risk, through <b>hold the line</b> .	<p>Protection from erosion of some homes and businesses, the harbour, some of the allotments, a place of worship, a museum and a small part of the West Somerset Railway.</p> <p>Protection of two substations and the Conservation Area at Watchet from flooding.</p> <p>This policy will limit natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features thereby limiting the visible exposures. However in very long term, the move towards No Active Intervention would reduce this impact.</p> <p>Protection from erosion of sections of the CWS from Blue Anchor to Lilstock Cliffs.</p>	<p>The objective of the Plan here is to continue protecting Watchet from flood and erosion risk.</p> <p>Defences protect the West Somerset Railway towards Doniford at the western end of this section. Under this policy these defences could be maintained and improved to continue preserving the railway.</p> <p>This would support like policies on other parts of this coast to the west.</p> <p>If the railway was not protected by policies to the west, then justification for retaining defences here would be doubtful.</p>
7d26 – Doniford to St Audries Bay	Observe & Monitor	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Continue to allow existing localised defences to be maintained or replaced if alternative funding is available to reduce the risk of erosion.</p> <p>If alternative funds are not available, then allow natural coastal evolution to continue through <b>no active intervention</b>.</p>	<p>Doniford Holiday Park with its tourism facilities is at risk of erosion because of the policy of No Active Intervention if alternative funds are not available to retain defences here.</p> <p>If defences are maintained this will limit natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby limiting the visible exposures. However, if defences are not maintained then this would reduce this impact.</p> <p>Erosion could reduce in size the County Wildlife Site at Doniford.</p> <p>Loss of Grade 3 agricultural land from flooding and erosion.</p> <p>Potential loss of a number of non-designated archaeological sites. Loss of these features depends upon where erosion occurs in the future.</p>	<p>The objectives of the Plan are to allow this coast to evolve naturally in the long term, while managing flood and erosion risk to people and property in the short to medium term by developing ways of adapting to the risk. This section is largely undefended, although there are rock revetment defences fronting Doniford Holiday Park. It is unlikely that these would attract public funds from the flood and coastal defence budget to maintain and improve them.</p> <p>If alternative funds are available for this purpose, there is no reason from a processes point of view why these defences could not be retained. However, they would need to be replaced in the short term with much larger structures to provide adequate protection.</p> <p>Retention of defences here could also become technically more difficult: they would exacerbate narrowing and loss of beach as sea levels rise and could also become outflanked as the undefended cliffs on either side erode.</p> <p>There would be less beach to attract visitors to the area, which could affect the viability of the Holiday Park.</p> <p>Therefore this may be impossible to justify economically, even using alternative funds in the future.</p>

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7d27 – St Audries Bay	Observe & Monitor / Hold	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>This policy will allow continuation of natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby maintaining the visible exposures.</p> <p>Erosion could reduce in size the CWS at the Blue Anchor to Lilstock Cliff and Hinkley Point.</p> <p>Risk of erosion to holiday village and cliff top properties.</p> <p>Potential loss from erosion of a small section of the registered park and garden at St Audries.</p> <p>Potential loss of a number of non-designated archaeological sites. Loss of these features depends upon where erosion occurs in the future.</p>	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d28 – St Audries Bay to Lilstock	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>This policy will allow continuation of natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby maintaining the visible exposures.</p> <p>Erosion could reduce in size the CWS at the Blue Anchor to Lilstock Cliff.</p> <p>Loss of Grade 3 agricultural land to erosion.</p> <p>Potential loss of a number of non-designated archaeological sites. Loss of these features depends upon where erosion occurs in the future.</p>	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
7d29 – Lilstock	Hold	Maintain the existing embankment/gabion defences to continue protection against flooding, through <b>hold the line</b> , while preparing to move towards the medium term policy.	Allow natural coastal evolution by moving towards a policy of <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>This policy will limit natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features thereby limiting the visible exposures in the short term. However, in medium to long term, the move towards No Active Intervention would reduce this impact.</p> <p>Erosion could reduce in size the CWS at the Blue Anchor to Lilstock Cliff.</p> <p>Loss of Grade 3 agricultural land to flooding and erosion.</p>	<p>The objective of the Plan here is to continue to allow this section of coast to evolve naturally in the long term.</p> <p>The short defence at Lilstock protects very few assets in the small area of lower-lying hinterland.</p> <p>A policy of No Active Intervention would not put any more assets at risk of flooding but would allow the beach in this area to roll back landwards as sea levels rise.</p>
7d30 – Lilstock to Hinkley Point	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>This policy will allow continuation of natural processes that are key to the integrity of Blue Anchor to Lilstock SSSI's geological features, thereby maintaining the visible exposures.</p> <p>Loss of Grade 3 agricultural land to flooding and erosion.</p>	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
<b>POLICY SCENARIO AREA: HINKLEY POINT TO BREAN DOWN</b>						

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7d31 – Hinkley Point	Hold	Maintain the existing seawall defences, and possibly construct new seawall defences along the shoreline to the west, to continue protection against flood and erosion risk, through <b>hold the line</b> . If new defences are not required along the western part of this frontage as part of the Hinkley Point power station expansion, then <b>no active intervention</b> is to occur.	Maintain the defences to continue protection against flood and erosion risk, through <b>hold the line</b> . Any areas where the coast remains undefended are to be allowed to evolve naturally under <b>no active intervention</b> .	Maintain the defences to continue protection against flood and erosion risk, through <b>hold the line</b> . Any areas where the coast remains undefended are to be allowed to evolve naturally under <b>no active intervention</b> .	<p>Protection of Hinkley Point Nuclear Power Station and outfall pipes from erosion on the western edge of the site. The landfill sites here are not susceptible to erosion or flooding.</p> <p>If the power station's site is extended westwards, and defences are needed as part of this expansion,, there is likely to be loss of some intertidal habitat through coastal squeeze (narrowing of the shoreline). This could affect Bridgwater Bay SSSI and National Nature Reserve, Severn Estuary SAC, SPA, Ramsar Site and Hinkley Point CWS. This could also impact upon a number of non-designated archaeological sites.</p> <p>If expansion of the power station site doe not require shoreline defences, this impact would be reduced, although could still occur as a result of natural processes due to resistant nature of the cliffs.</p>	<p>The objective of the Plan here is to continue to provide protection against flood and erosion risk to Hinkley Point Nuclear Power Station.</p> <p>This also covers the proposed extension about 1km westwards along the shore as part of the site's expansion and the development of Hinkley Point 'C'.</p> <p>Continued defence here will reduce the amount of sediment transported around Hinkley Point from west to east towards the mouth of the Parrett.</p> <p>This would occur regardless of any effects of a proposed jetty that may be built as part of the Power Station extension.</p>
7d32 – Hinkley Point to Stolford	Hold	Continue to maintain existing embankment defences under a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> along this stretch.	<b>Hold the line</b> of the realigned defence.	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar by creating intertidal habitat in areas of Managed Realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat.</p> <p>Depending where the realigned defences are, small areas of agricultural land will be permanently lost.</p> <p>Protection from flooding of homes, businesses and roads at Stolford as it's anticipated that the realigned position would be in front of this area.</p> <p>Power lines running from Hinkley Point are located in the floodplain. Managed realignment would need to consider the implications for these assets; these could be defended locally or may need to be relocated.</p>	<p>The objective here is to continue to protecting Hinkley Point Nuclear Power Station from flood risk in a sustainable way, working with natural processes.</p> <p>There is potential to realign defences to a more sustainable position in the medium to long term as existing defences reach the end of their effective life and need to be replaced.</p> <p>Implementing this requires more detailed study but could involve constructing and maintaining a set-back defence embankment.</p> <p>Realignment here could deepen the bay which would further reduce the potential for sediment to be transported eastwards, towards the mouth of the Parrett.</p>
7d33 – Stolford	Observe & Monitor	Continue maintaining existing embankment defences under a <b>hold the line</b> policy. Investigate managed realignment opportunities.	Implement <b>managed realignment</b> along this stretch.	<b>Hold the line</b> of the realigned defence.	<p>Protection from flooding of homes, businesses and roads at Stolford, as well as listed buildings at Stolford Farm, as it's anticipated that the realigned position would be in front of this area.</p> <p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site through the creation of intertidal habitat in areas of Managed Realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat.</p>	<p>The objective of the Plan here is to continue protecting Hinkley Point Nuclear Power Station and Stolford village against flood risk in a sustainable way, working with natural processes.</p> <p>The defences could be realigned to a more sustainable position in the medium to long term as they reach the end of their effective life and need to be replaced.</p> <p>Implementation of this requires more detailed study but could involve construction and maintenance of a set-back defence embankment.</p> <p>Realignment here could mean this frontage becoming less of a barrier to longshore transport of sediment eastwards, towards the mouth of the estuary.</p> <p>Realignment here may therefore reduce the effects of realignment immediately to the west.</p>

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7d34 – Stolford to Wall Common	Observe & Monitor	Initially continue to maintain the shingle bank and defences to <b>hold the line</b> while measures are put in place to manage the change to <b>managed realignment</b> .	<b>Hold the line</b> of the set-back defences protecting the power lines and areas to the west provided this remains economically justified.  <b>No active intervention</b> along the shoreline.	<b>Hold the line</b> of the set-back defences protecting the power lines and areas to the west provided this remains economically justified.  <b>No active intervention</b> along the shoreline.	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site by creating intertidal habitat in areas of Managed Realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat.</p> <p>The low-lying County Wildlife Site at Wall Common West is inside the proposed Managed Realignment so would be affected by it.</p> <p>Some agricultural land will be permanently lost, though exact areas involved depend upon extent of realignment.</p> <p>Power lines running from Hinkley Point are located in the floodplain. Managed realignment, and the possible long-term move to No Active Intervention, would need to consider the implications for these assets; these could be defended locally or may need to be relocated.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objective of the Plan in this area is to investigate and, if appropriate, implement Managed Realignment to create habitat of benefit to the wider Severn and Parrett estuaries.</p> <p>Opportunities for Managed Realignment to create habitat here are currently under detailed investigation and consultation as part of the Steart Managed Realignment Project.</p> <p>This project is looking at options for realignment that involve constructing a set-back defence to protect critical infrastructure, such as power lines and access to Hinkley Point Nuclear Power Station, against flood risk.</p> <p>Options from the realignment study for creating habitat on the eastern side of Steart Peninsula in the short term could 'buffer' a transition towards No Active Intervention in the medium to long term, by creating inter-tidal habitat in these areas in a managed way, prior to this occurring naturally as a result of longer term no active intervention.</p>
7d35 – Steart Village	Observe & Monitor	Continue to minimise flood and erosion risk to Steart village from the Parrett, through <b>managed realignment</b> if a scheme can be justified on habitat creation ground, otherwise, <b>no active intervention</b> .  On the seaward side initially continue to minimise flood and erosion risk to Steart village, through <b>hold the line</b> , while measures are put in place to manage the change in policy to <b>no active intervention</b> .	Continue to maintain set back defences while it remains viable to do so. Allow natural coastal evolution on the seaward side through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site through the creation of intertidal habitat as a result of the move to No Active Intervention.</p> <p>Loss of property and infrastructure at Steart village in the medium term, as policy moves towards No Active Intervention.</p> <p>Power lines running from Hinkley Point are located in the Steart area. The move to No Active Intervention would need to consider the implications for these assets; these may need to be defended locally or may need to be relocated.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state, and to continue to defend against flood risk in a sustainable way where it is environmentally acceptable and economically viable.</p> <p>As adjacent areas retreat, this area would become more exposed along the shoreline, so existing defences would need to be replaced in the short term with much larger structures. This would make it technically more difficult to sustain defences here and also unlikely to be economically justifiable.</p> <p>Therefore existing defences would be maintained for as long as technically possible during the short term and into the medium term.</p> <p>This will allow the implications of moving to a No Active Intervention policy to be fully investigated to help in planning how to adapt to any increased flood risk.</p> <p>Options from the realignment study for creating habitat on the eastern side of Steart Peninsula in the short term could 'buffer' a transition towards No Active Intervention in the medium to long term, by creating inter-tidal habitat in these areas in a managed way, prior to this occurring naturally as a result of longer term no active intervention.</p> <p>Removing defences here could affect the east bank of the Parrett Estuary around the Huntspill River. However, these effects are best dealt with by managing the east bank rather than this part of the Steart Peninsula.</p>

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7d36 – South of Steart Village to north of Comwich (line of national grid power lines)	Observe & Monitor	Initially continue to minimise flood and erosion risk to Steart village, through <b>hold the line</b> , while measures are put in place to manage the change in policy to <b>managed realignment</b> in PUs 7d34, 7d35 and 7d37.	<b>No active intervention</b> along the former Parrett Banks.	<b>No active intervention</b> along the former Parrett Banks.	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site by creating intertidal habitat as a result of the move to No Active Intervention.</p> <p>Power lines running from Hinkley Point are located in the Steart area. The move to No Active Intervention would need to consider the implications for these assets; these may need to be defended locally or may need to be relocated.</p> <p>Loss of a number of non-designated archaeological features as a result of the move to No Active Intervention.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state, and to continue defending against flood risk in a sustainable way where this is environmentally acceptable and economically viable.</p> <p>The existing defences could be maintained for as long as technically possible during the short term and into the medium term, to support similar measures in adjacent policy units.</p> <p>This will allow the implications of moving to a No Active Intervention policy to be fully investigated to help in planning how to adapt to any increased flood risk.</p> <p>Options from the realignment study for creating habitat on the eastern side of Steart Peninsula in the short term could 'buffer' a transition towards No Active Intervention in the medium to long term, by creating inter-tidal habitat in these areas in a managed way, prior to this occurring naturally as a result of longer term no active intervention.</p> <p>Removing defences here could affect the east bank of the Parrett Estuary around the Huntspill River. However, these effects are best dealt with by managing the east bank rather than this part of the Steart Peninsula.</p>
7d37 – Parrett Estuary from line of national grid power lines to Comwich	Observe & Monitor	Maintain the existing defences to continue to minimise flood risk, through <b>hold the line</b> .	Maintain the existing defences to continue to minimise flood risk, through <b>hold the line</b> , including the new set-back defences protecting the power lines and areas to the west, provided it remains economically justifiable to do so.	Maintain the existing defences to continue to minimise flood risk, through <b>hold the line</b> , including the set-back defences protecting the power lines and areas to the west, provided it remains economically justifiable to do so.	<p>Potential for habitat loss due to coastal squeeze (narrowing of the shoreline) where defences are held, adversely affecting Bridgwater Bay SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site.</p> <p>Continued protection against flood risk to properties in lower-lying parts of Stockland Bristol.</p> <p>Power lines running from Hinkley Point would continue to be protected.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state, and to continue defending against flood risk in a sustainable way where it is environmentally acceptable and economically viable.</p> <p>Continued maintenance of defences along this section of the outer west bank of the Parrett Estuary in the long term would support any realignment of the wider Steart Peninsula and also continue to constrain the estuary's low water channel.</p>

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7d38 – Combwich	Hold	Continue to minimise flood risk to Combwich by maintaining the existing flood defences, through <b>hold the line</b> .	Continue to minimise flood risk to Combwich by maintaining and, if necessary, rebuilding the existing flood defences, through <b>hold the line</b> .	Continue to minimise flood risk to Combwich by maintaining the existing flood defences, through <b>hold the line</b> .	<p>Protection of homes, businesses and infrastructure at Combwich against flood risk.</p> <p>Potential for habitat loss due to coastal squeeze (narrowing of the shoreline) where defences are held, adversely affecting Bridgwater Bay SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site.</p> <p>Potential for changes in the morphology of the outer estuary – as a result of realignment/No Active Intervention – to cause siltation of the river channel at Combwich. This could affect navigation and access for commercial shipping, but requires more detailed investigation.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state and to continue to defend against flood risk in a sustainable way where it is environmentally acceptable and economically viable.</p> <p>It is likely to be economically viable to continue to reduce flood risk to people, property and infrastructure at Combwich.</p>
7d39 – Combwich to Bridgwater (Parrett west)	N/A	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy, as proposed by the Parrett Estuary Flood Risk Management Strategy.	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy. Investigate opportunities for implementing managed realignment in the long term.	Implement <b>managed realignment</b> as informed by studies, otherwise maintain and, if necessary, rebuild the existing flood defences under a policy of <b>hold the line</b> .	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site by creating intertidal habitat in areas of Managed Realignment in the medium term.</p> <p>A significant area of agricultural land would be permanently lost through Managed Realignment, although the exact areas depend upon extent of realignment.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p> <p>Continued protection of many properties, including those at Cannington and Chilton Trinity, and roads against flood risk, although some properties may be lost depending upon extent of realignment.</p> <p>Power lines running from Hinkley Point are located in the floodplain. Managed realignment would need to consider the implications for these assets; these could be defended locally or may need to be relocated.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state, and to continue to defend against flood risk in a sustainable way where it's environmentally acceptable and economically.</p> <p>The Parrett Estuary Flood Risk Management Strategy identified that there is slightly better economic justification to Hold the Line in the short to medium term compared to Managed Realignment, taking into account all the costs of implementing realignment. Realignment is more likely to be viable in the long term.</p> <p>Implementation of Managed Realignment here requires more detailed study to understand its effects on the rest of the estuary and open coast, in terms of both individual and cumulative effects of realignment here and in other parts of the outer Parrett Estuary.</p> <p>A key factor in undertaking realignment here will be prior construction of a surge barrier to ensure changes in this part of the estuary do not significantly increase flood risk at Bridgwater. Implementation of a surge barrier requires more detailed study of the technical aspects and environmental implications.</p>
7d40 – Bridgwater (upper Parrett Estuary)	N/A	Continue to minimise flood risk to Bridgwater by maintaining the existing flood defences, through a <b>hold the line</b> policy.	<p>Continue to minimise flood risk to Bridgwater by maintaining and, if necessary, rebuilding the existing flood defences, through a <b>hold the line</b> policy.</p> <p>Construction of a surge barrier (as informed by further studies).</p>	Continue to minimise flood risk to Bridgwater by maintaining the existing flood defences, through a <b>hold the line</b> policy.	<p>Protection from flooding for substations and landfill sites in Bridgwater and Sedgemoor.</p> <p>Protection from risk of flooding for a significant number of homes, businesses, the A38 and M5, mainline railway and associated facilities and infrastructure.</p>	<p>The objective of the Plan for the upper Parrett Estuary is to continue to reduce flood risk for a significant number of people, property and infrastructure at Bridgwater.</p> <p>Construction of a surge barrier will be vital to providing adequate flood protection here. The need for a surge barrier to counter the effects of rising sea levels has already been identified in the Parrett Estuary Flood Risk Management Strategy.</p> <p>This is because of the potential for changes in the volume of water that flows in and out of the outer Parrett Estuary that could result of the medium to long term policies proposed.</p>

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7d41 – Bridgwater to Dunball	N/A	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy.	Continue to minimise flood risk to Bridgwater by maintaining and, if necessary, rebuilding the existing flood defences through a <b>hold the line</b> policy.	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy.	<p>Protection of substations in Bridgwater and Sedgemoor from flooding.</p> <p>Protection from flooding for homes and businesses, the A38 and M5, mainline railway and associated facilities and infrastructure, including major substations serving around 172,500 homes and businesses in the Bridgwater area.</p> <p>Potential for habitat loss due to coastal squeeze (narrowing of the shoreline) where defences are held, adversely affecting Bridgwater Bay SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site.</p>	The objective of the Plan for the upper Parrett Estuary is to continue to reduce flood risk to people, property and infrastructure between Bridgwater and Dunball, which includes the mainline railway and the M5.



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7d42 – Dunball to River Brue	Hold	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy. Investigate opportunities for managed realignment.	Implement <b>managed realignment</b> at Pawlett Ham, for example, as informed by studies. Otherwise maintain and, if necessary, rebuild the existing flood defences, under a policy of <b>hold the line</b> .	Implement <b>managed realignment</b> as informed by studies at places such as Pawlett and Huntspill levels. Otherwise maintain and, if necessary, rebuild the existing flood defences under a policy of <b>hold the line</b> .	<p>Potential benefits to the Bridgwater SSSI and National Nature Reserve, Severn Estuary SAC, SPA and Ramsar site by creating intertidal habitat in areas of Managed Realignment in the medium term.</p> <p>A Hold the Line policy in the long term could eventually cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat.</p> <p>A significant area of agricultural land will be permanently lost through Managed Realignment, though the exact areas depend upon extent of realignment.</p> <p>Continued protection against flood risk for many properties, roads – including the A38 and M5 – and the mainline railway and associated facilities.</p> <p>The mouth of the Huntspill River Channel would need to be adapted as part of any realignment along the Pawlett and Huntspill Levels. This could alter the conservation value of the Huntspill River National Nature Reserve, although it would also create new intertidal habitat.</p> <p>Potential for changes in the morphology of the outer estuary – as a result of realignment/No Active Intervention. This could affect navigation and access for commercial shipping, to Dunball, but requires more detailed investigation.</p> <p>Power lines running from Hinkley Point are located in the Pawlett Ham area. Managed realignment would need to consider the implications for these assets; these could be defended locally or may need to be relocated.</p> <p>The Sewage Treatment Works that serves Burnham-on-Sea and Highbridge would be protected in the short to medium term, though consideration to its future position should be considered as and when it requires upgrading or replacement, in line with the long-term policy to realign in this area.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objectives of the Plan for the Parrett Estuary are to return it to a more natural, less constrained state and to continue to defend against flood risk in a sustainable way, where it is environmentally acceptable and economically viable.</p> <p>There are opportunities for Managed Realignment to provide flood storage and create habitat along this stretch. In particular, Pawlett Ham has been identified in the recent Parrett Estuary Flood Risk Management Strategy.</p> <p>Implementation of this policy could involve constructing a set-back defence embankment and making a breach in the existing defence.</p> <p>Realignment along the Pawlett and Huntspill Levels frontage could also occur in the long term, as the Huntspill Sluice reaches the end of its effective life and needs replacing.</p> <p>Realignment at this time would provide a more sustainable defence position, particularly if the existing defence is significantly affected by changes to the Parrett low-water channel that may occur as a result of the proposed policies for the Steart Peninsula.</p> <p>Implementation of Managed Realignment here requires more detailed study to understand its implications for the rest of the estuary and open coast, in terms of individual and cumulative impacts here and in other parts of the outer Parrett Estuary.</p> <p>A key factor in undertaking realignment here will be prior construction of a surge barrier to ensure changes in this part of the estuary do not significantly increase flood risk at Bridgwater. Implementation of a surge barrier requires more detailed study of the technical aspects and environmental implications.</p>

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<b>7d43 – Burnham-on-Sea and Highbridge</b>	Hold	Continue to minimise flood risk along this frontage by maintaining and improving as necessary the defences, through a <b>hold the line</b> policy.	Continue to minimise flood risk along this frontage by maintaining and improving as necessary the defences, through a <b>hold the line</b> policy.	Continue to minimise flood risk along this frontage by maintaining and improving as necessary the defences, through a <b>hold the line</b> policy.	<p>Potential narrowing, steepening and even loss of beach, especially at Burnham-on-Sea, depends on the future course of the Parrett low water channel.</p> <p>Conservation Areas and Grade II Listed Buildings at Burnham-on-Sea continue to be protected against flood risk.</p> <p>Continued protection against flood risk for homes, businesses and key infrastructure including the A38 and M5, mainline railway and associated facilities and infrastructure, including a major sub-station serving around 10,500 homes and businesses in Burnham-on-Sea.</p>	<p>The objective of the Plan here is to protect Burnham-on-Sea and Highbridge against flood risk.</p> <p>The future course of the Parrett Estuary low-water channel will significantly influence how this policy is achieved in the future, particularly at Burnham-on-Sea.</p>

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7d44 – Berrow to Brean (north)	Observe & Monitor (possible Hold)	Continue to minimise the risk of flooding along this frontage through dune management to provide a more effective defence, through a policy of <b>hold the line</b> . Investigate long term sustainable management options, including improvement of existing defences and construction of a set-back defence.	The aim will be to continue to minimise the risk of flooding along this frontage. Implementation expected to be investigated by detailed study in the short term but is anticipated to include dune management to provide a more effective defence, through a policy of <b>managed realignment</b> and potential construction of a set-back defence.	The aim will be to continue to minimise the risk of flooding to the wider area of the Somerset Levels and Moors from this frontage. Implementation is to be investigated by detailed study in the short term but is expected to include management of the dunes and beach to restore the dunes as much as possible to provide a more robust natural defence through a policy of <b>managed realignment</b> and potential construction and maintenance a set-back defence.	<p>In order to implement Managed Realignment, properties will probably need to be moved to allow for dune management. This will encourage the dunes to redevelop and provide a more robust natural defence.</p> <p>Potential benefits to the Severn Estuary SSSI, SAC, SPA and Ramsar site by creating habitat in areas of Managed Realignment in the medium term.</p> <p>Protection from flooding for homes, businesses and key infrastructure including the A38 and M5, the mainline railway and associated facilities.</p> <p>Berrow Dunes Local Nature Reserve and SSSI will continue to evolve largely naturally, with dune management seeking to reduce human impacts.</p>	<p>The objectives of the Plan here are to provide sustainable protection against flood risk to Berrow and Brean and the wider Somerset Levels and Moors, working with natural processes as far as possible and retaining the natural features and beaches to benefit of tourism.</p> <p>To Hold the Line along this stretch in the medium to long term would require the construction of very large hard defences. These would exacerbate beach narrowing and loss (the beach being covered at most states of the tide), making it technically more difficult to maintain defences in the long term. If there is little or no beach left, visitors would be less likely to be attracted to the area.</p> <p>Retaining the beach would need shoreline control structures (e.g. groynes or offshore reefs), which would be likely to adversely affect the management of down-drift sections of coast. Introduction of large, hard defences would also not be economically viable. Brean sits largely on high dunes that provide a natural defence for the Somerset Levels and Moors; if this were eroded in the long term, then the more sustainable solution to protect the Somerset Levels would be to construct a set-back defence inland. This would probably need to be smaller and less costly to maintain. The location of a set back defence would be determined by more detailed studies.</p> <p>To try to retain more beach material here and reduce flood risk to the Somerset Levels and Moors, this policy would manage the realignment of the coast by encouraging the dunes in this area to recover. The aim would be to provide a more robust natural defence to hold the rear line of dunes, similar to that provided by the more extensive dunes at Berrow. However, the Brean dunes are unlikely to recover to that extent due to limited availability of suitable sediment in the system; although these measures may mitigate recreational erosion. This is in line with policy recommendations from a recent 2008 report that investigated the Burnham-on-Sea to Brean area in detail. The dunes at Brean are currently degraded and eroding. To achieve this policy, the dunes would need to be encouraged to become re-established in the short term. This could potentially mean property being lost and so adaptation measures will be required; although this requires more detailed investigation and would be informed by ongoing monitoring.</p> <p>To support the long-term policy between Brean and Brean Down and reduce flood risk to the Somerset Levels and Moors, a set-back defence would need to be constructed along the north end of Brean, between the coast and the Axe Estuary. This defence would then be maintained in the long term as part of this unit.</p> <p>The frontal dunes at Berrow are likely to experience overtopping and breaching as sea levels rise. Flood risk to the wider area will be controlled by the extensive back dunes. It is not predicted that these will be compromised over the next 100 years.</p>

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		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
7d45 – Brean (north) to Brean Down	Hold	Continue to minimise the risk of flooding along this frontage by maintaining the existing defences under a <b>hold the line</b> policy.	Continue to minimise the risk of flooding along this frontage by maintaining the existing defences under a <b>hold the line</b> policy.	If not possible to continue to <b>hold the line</b> , then allow more natural coastal evolution to occur by moving towards a policy of <b>managed realignment</b> .	<p>Potential narrowing, steepening and even loss of beach fronting the defences until they are realigned.</p> <p>Potential loss of homes and businesses in the long term if the policy moves to Managed Realignment, depending on the extent of realignment that occurs.</p> <p>Potential for habitat creation in the long term as a result of realignment.</p> <p>A significant area of agricultural land could be permanently lost by moving to Managed Realignment.</p> <p>Transport infrastructure providing access to Brean could be maintained for as long as it is required; in the long term, access to Brean may need to be provided in a different way as a result of the move to Managed Realignment; or it may not be required at all.</p>	<p>The objectives of the Plan here are to provide sustainable protection against flood risk to the Somerset Levels and Moors, working with natural processes as far as possible and allowing this area to evolve naturally in the long term.</p> <p>The long-term sustainable management of this frontage is to be investigated as part of a detailed study in the short term. However, based on available information it is considered that to Hold the Line along this stretch in the long term would require the existing hard defences to be replaced with larger structures once they reach the end of their effective life. It is uncertain if larger replacement defences would be technically sustainable in the current position and it is more likely that a realigned defence position would be adopted in the long term.</p> <p>As sea levels rise, retaining the defences would exacerbate the narrowing and loss of the beach; the beach would become covered at most states of the tide. This would also make it technically more difficult to maintain existing defences in the long term.</p> <p>The long-term policy for Managed Realignment could occur once the existing defences reach the end of their effective life; if this occurs then they would then not be replaced and so would gradually deteriorate and fail and a set back defence constructed to continue to reduce flood risk.</p> <p>Construction of a set-back defence during the medium term, possibly along the north of Brean (see adjacent section), would also be required to minimise flood risk to the wider Somerset Levels and Moors and so this should be considered alongside needs for realigned defences in this area also.</p> <p>The policy on the west bank of the Axe Estuary in the long-term supports the policy on this stretch.</p> <p>These policies mean that the future course of the Axe Estuary could alter in the very long term so that it discharges to the south of Brean Down.</p> <p>This could affect how sediment circulates in Bridgwater Bay and further study is required to understand this.</p>
7d46 – Brean Down (south side)	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, historic features, conservation or land areas.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
<b>POLICY SCENARIO AREA: BREAN DOWN TO ANCHOR HEAD (WESTON BAY)</b>						

Proposed Policy Unit (Number & Description)	SMPI Policy	Preferred Policy			Summary of Specific Policy Implications	Supporting Information
		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
<b>7e01 – Brean Down (north side) to Axe Estuary mouth (west)</b>	Do Nothing	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	Allow natural coastal evolution to continue through <b>no active intervention</b> .	No implications for development, historic features, conservation or land areas.	The objective of the Plan here is to continue to allow this undefended section of coast to evolve naturally.
<b>7e02 – Axe Estuary left (west) bank (mouth to near Diamond Farm)</b>	Hold (locally Retreat)	Continue to minimise flood risk by maintaining the existing flood defences, through <b>hold the line</b> .	Continue to minimise flood risk by maintaining the existing flood defences, through <b>hold the line</b> . Consider moving towards a policy of <b>managed realignment</b> .	If not possible to continue to <b>hold the line</b> , then allow more natural coastal evolution to occur by moving towards a policy of <b>managed realignment</b> .	<p>Potential loss of homes and businesses in the long term if the policy moves to Managed Realignment, depending on the extent of realignment that occurs.</p> <p>Potential benefits to the Severn Estuary SSSI SAC, SPA and Ramsar site in the long term by creating habitat.</p> <p>A Hold the Line policy may cause coastal squeeze (narrowing of the shoreline) and the potential loss of intertidal habitat. If it occurs, the move to Managed Realignment in the long term could reduce this impact.</p> <p>A significant area of agricultural land could be permanently lost as a result of the move to Managed Realignment.</p>	<p>The objective of the Plan here is to allow this section of coast to evolve more naturally in the long term.</p> <p>Continued maintenance of defences along this west bank of the Axe Estuary in the short to medium term would support the policies along the open coast between Brean and Brean Down.</p> <p>These banks may not be maintained along existing alignments in the long term as the open coast moves to a policy of Managed Realignment.</p> <p>Construction of a set-back defence in the medium to long term along the north of Brean (refer to units 7d44 and 7d45) could therefore be required in order to minimise flood risk to the wider Somerset Levels and Moors from this area, which would increase if the defences were allowed to fail as a result of a change in the long term policy.</p> <p>These policies mean that the future course of the Axe Estuary could alter in the very long term so that it discharges to the south of Brean Down.</p> <p>This could have implications for sediment circulation in Bridgwater Bay, and further study is required to understand the effects of this.</p>
<b>7e03 – Axe Estuary right (east) bank (near Diamond Farm to mouth)</b>	Hold (locally Retreat)	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy. Investigate opportunities for Managed Realignment.	Implement <b>managed realignment</b> as informed by detailed studies, otherwise maintain and if necessary rebuild the existing flood defences, under a policy of <b>hold the line</b> .	Continue to minimise flood risk by maintaining the existing (or set back) flood defences, through <b>hold the line</b>	<p>Continue to protect homes and businesses against flood risk, as well as key infrastructure including the A38 and M5, the mainline railway and associated facilities.</p> <p>Potential benefits to the Severn Estuary SSSI, SAC, SPA and Ramsar site by creating intertidal habitat in areas of Managed Realignment in the medium term. A Hold the Line policy in the long term will cause coastal squeeze (narrowing of the shoreline) and loss of intertidal habitat.</p> <p>Potential impacts on a number of non-designated archaeological features, depending upon extent of realignment, which would be determined through further detailed study.</p>	<p>The objectives of the Plan here are to provide sustainable protection against flood risk to the wider Somerset Levels and Moors, working with natural processes as far as possible.</p> <p>There are opportunities here for Managed Realignment to provide flood storage and create habitat.</p> <p>Implementing this policy could involve constructing a set-back defence embankment and making a breach in the existing defence, which would require more detailed investigation.</p> <p>On parts of this section not subject to realignment, defences would be maintained and improved along existing alignments.</p>

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		Short Term (to 2025)	Medium Term (to 2055)	Long Term (to 2105)		
<b>7e04 – Axe Estuary mouth to Uphill</b>	Hold (possibly Retreat long term)	Continue to minimise flood risk by maintaining the existing flood defences, through a <b>hold the line</b> policy. Investigate opportunities for Managed Realignment.	Implement <b>managed realignment</b> as informed by studies, otherwise maintain and if necessary rebuild the existing flood defences, under a policy of <b>hold the line</b> .	Continue to minimise flood risk by maintaining the existing (or set back) flood defences, through <b>hold the line</b>	<p>Continued protection against flood risk for homes and businesses in Uphill and for key infrastructure including the A38 and M5, the mainline railway and associated facilities.</p> <p>Potential to retain beach along this frontage by allowing it to adapt to realigned position as sea levels rise.</p> <p>Habitat creation could benefit the Severn Estuary SSSI SAC, SPA, Ramsar site, Uphill SSSI and the CWS in the long term.</p> <p>A Hold the Line policy may cause coastal squeeze (narrowing of the shoreline) and the loss of intertidal habitat.</p>	<p>The objectives of the Plan here are to provide sustainable flood protection for the wider Somerset Levels and Moors, working with natural processes as far as possible.</p> <p>Continued maintenance of the seawall here will become increasingly technically difficult to sustain as sea level rise makes the beaches narrower.</p> <p>Once defences reach the end of their effective life, the defence line could be realigned landwards to a more sustainable position.</p> <p>This will not only continue to reduce flood risk to Uphill from this area, but could also provide an opportunity for retaining more beach material to benefit Uphill.</p>
<b>7e05 – Uphill to Weston-super-Mare (south)</b>	Hold (possibly Retreat long term)	Allow natural coastal evolution to continue as far as possible but undertake dune monitoring and management if required to support the defence function of the dunes through <b>managed realignment</b> . If monitoring identifies that the dunes are at risk of breaching, then construct a secondary defence embankment this policy.	Allow natural coastal evolution to continue as far as possible but undertake dune monitoring and management if required to support the defence function of the dunes through <b>managed realignment</b> . If monitoring identifies that the dunes are at risk of breaching, then construct a secondary defence embankment this policy.	Allow natural coastal evolution to continue as far as possible but undertake dune monitoring and management if required to support the defence function of the dunes through <b>managed realignment</b> . If monitoring identifies that the dunes are at risk of breaching, then construct a secondary defence embankment this policy.	<p>In the long term there will be continued protection against flood risk for homes and businesses in Uphill, as well as for key infrastructure including the A38 and M5, the mainline railway and associated facilities.</p> <p>Habitat creation could benefit the Severn Estuary SSSI SAC, SPA and Ramsar site in the long term.</p> <p>The dunes here will be allowed to evolve naturally as much as possible to provide a robust natural defence.</p> <p>Potential impacts on a number of non-designated archaeological features and the Weston-super-Mare Conservation area, depending upon extent of future erosion of the dunes.</p>	<p>The objectives of the Plan here are to provide sustainable protection against flood risk for people, property and infrastructure at Uphill and Weston-super-Mare, working with natural processes as far as possible.</p> <p>Between Uphill and Weston-super-Mare, a short section of undefended dunes provides a natural defence. Pro-active dune management will support this defence function.</p> <p>As sea levels rise, the effectiveness of these dunes as a defence could be compromised.</p> <p>A secondary defence embankment could be constructed landwards of the dunes to minimise flood risk to people, property and infrastructure in Uphill and Weston-super-Mare.</p>
<b>7e06 – Weston-super-Mare</b>	Hold	Minimise risk of flooding and erosion to Weston-super-Mare by maintaining the existing defences, through a <b>hold the line</b> policy.	Minimise risk of flooding and erosion to Weston-super-Mare by maintaining the existing defences, through a <b>hold the line</b> policy.	Minimise risk of flooding and erosion to Weston-super-Mare by maintaining, or upgrading, the existing defences, through a <b>hold the line</b> policy.	<p>Continued protection against flood risk for a significant number of homes and businesses in Weston-super-Mare, as well as for key infrastructure including the A370 and M5, the mainline railway and associated facilities and infrastructure including major substations serving around 84,000 homes and businesses.</p> <p>Potential for beach to reduce over time.</p> <p>Potential for habitat loss due to coastal squeeze (narrowing of the shoreline) where defences are held, adversely affecting Severn Estuary SAC, SPA and Ramsar site.</p>	<p>The objective of the Plan here is to continue protecting people, property and infrastructure at Weston-super-Mare against flood and erosion risk.</p>