Local Flood Risk Management Strategy for North Somerset

Part G – Coastal Flood Risk Awareness

North Somerset Council

Contents

1.0 Introduction

For centuries, people living in North Somerset have managed coastal areas to protect the land from the sea. Maps from the 1780s show earth mounds built to hold back spring tides. This management has evolved due to natural erosion and developing coastal communities.

A large part of North Somerset is below sea level at high tide and only remains dry due to a strip of land being higher on the coast and historic embankments that have been improved and raised over many years. There are gates and sluices that prevent the sea from flowing up rivers at high tide and flooding the land.

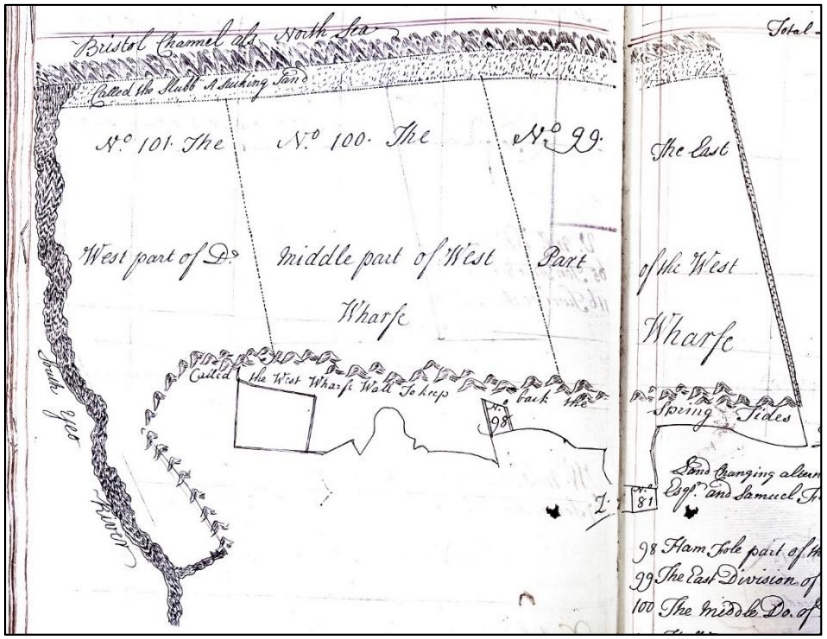


Image 1. 1780 Ledger showing 'West Wharf Walls to keep back the spring tides' Courtesy of South West Heritage Trust SHC DD/PT/H452/42

2.0 North Somerset's coast today

Our coast is a nationally important habitat that rare wading birds visit during the winter months, and today, there are also flood defences along the coast. These are a combination of walls, embankments, sand dunes, tidal exclusion flaps, and gates. Some examples of these are described below.

2.1 Walls

Walls have been built to protect the main urban coastal communities of North Somerset. Most of these were initially constructed by the Victorians as the popularity of seaside holidays grew and the health benefits of bathing in the sea were promoted.

They were originally built out of local stone and many still exist in the original form, having been repaired and re-built many times after damage by large storms.

Others such as those at Pill, Weston-super-Mare and Clevedon have been improved in more recent times.

Images 1 and 2. The Victorian sea walls at Clevedon protect residents from flooding when there is a combination of high tides and stormy weather.

Images 3 and 4. At Weston-super-Mare, the Victorian sea walls have already had an upgrade. Concrete steps have been built in front of the old walls to prevent waves from damaging the bottom of the wall. New walls were also constructed behind the promenade to protect properties from large waves that overtop the old walls. These were also designed so that they can be raised when needed in the future due to sea level rise.

Images 5 and 6. At Pill, the walls and flood gates prevent high tides and storm surges that flow up the River Avon from flooding nearby properties.

2.2 Earth embankments

Earth embankments are the most straightforward and oldest form of flood defence and have been used in North Somerset for hundreds of years.

Image 7 shows Portbury Nature Reserve and the Portbury Sea Wall Commissioners embankment. In front of the embankment is a salt marsh, a rare marine habitat that protects the nature reserve from flooding by reducing wave energy.

Portishead is now protected from flooding by a newer embankment and wall built as part of the nearby new development. The old embankment now only provides a small amount of protection for the nature reserve.

Image 8. is a typical example of an earth embankment around Wick Warth, Wick St Lawrence and Kingston Seymour. – In 1989/1990, a rock armour strengthening scheme was carried out on the existing defence north of Weston-super-Mare. This was followed in 1990 by bank strengthening to the Commission Bank and raising works in 1991. More recently, works around the Congresbury and Yeo tidal banks have further improved the protection of this part of the coast. Climate change and sea level rise will mean future work will be challenging to maintain the current level of protection.

2.3 Sand dunes

Sand dunes are both flood defences and valuable habitats.

Image 9. The dunes at Sand Bay are an integral part of the flood defences that protect properties nearby. They are artificial - in 1983/84, over 600,000 tonnes of sand were dredged from the Severn Estuary and pumped onto the beach, raising it by approximately three metres at the sea wall.

Image 10. The dunes along the back of the beach at Uphill are natural and formed from wind-blown sand. The vegetation cover is essential as it protects the dunes from erosion during large storms and maximises the protection they provide to the community at Uphill.

2.4 Tidal exclusion flaps and sluices

Image 11. It Shows Sampson's Sluice, where the Oldbridge River meets the flood defences along the coast. Sluices and flaps like these ensure a continuous line of protection along the coast.

Tidal exclusion flaps and sluices are on all rivers that flow to the sea in North Somerset. These stop high tides from flowing back up rivers and flooding land and properties. The tide can also stop rivers and watercourses from draining to the sea at high tide, leading to flooding.

Image 12. This is a tidal flap at Portishead's end of the Portbury Ditch. The flap lets water out when the tide is low and holds the tide back when the sea rises against the flap.

3.0 Flood risk from the coast.

The management of the current defences along the coast is a complex mixture of different organisations and landowners. The Environment Agency take the lead and have an overview of tidal flood risk along the coast and the development of future schemes. North Somerset Council is known as the Coast Protection Authority and is responsible for managing coastal erosion. The Environment Agency does not own any flood defences but, with the agreement of landowners, builds them and then maintains them. In some places along the coast, North Somerset Council is the landowner and has built and is responsible for maintaining flood defences. Private landowners may also be responsible for maintaining flood defences if the Environment Agency does not maintain them.

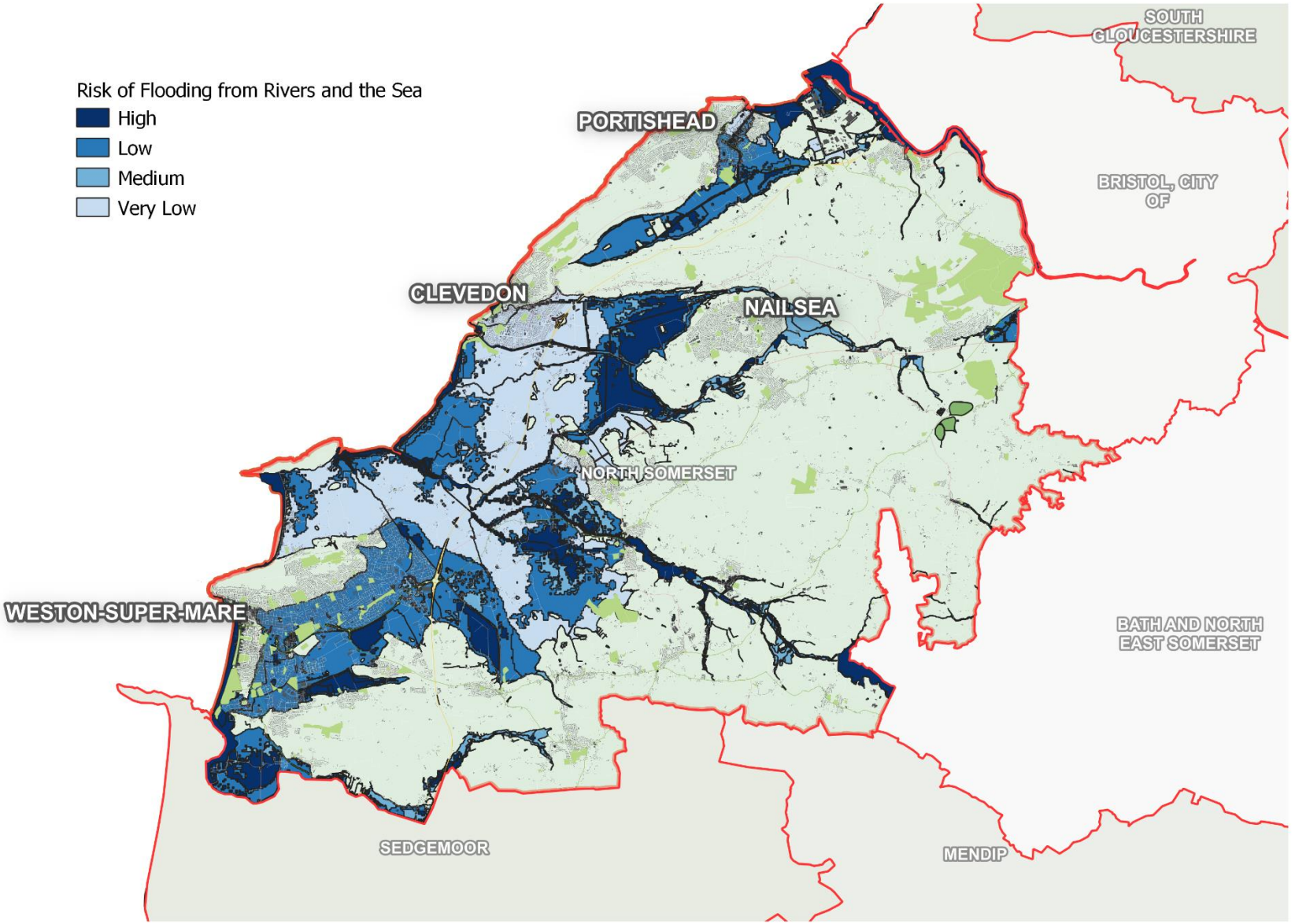
As a result of the current defences, each year, for most of North Somerset there is only a very low or low risk of being flooded. Flood defences are built to withstand the worst storms, but even then, unusual events occur, meaning waves could still overtop the defences, or the defences could fail.

Thankfully this risk is still relatively low, but everyone should be aware of their risk and know what to do if there is a flood warning. This risk will increase because global warming is raising sea levels. North Somerset Council is working with the Environment Agency to evaluate this risk. More information will be provided in a more detailed future strategy for the coast of North Somerset.

Get more information about flooding in your local area and sign up for flood alerts from the Environment Agency at www.gov.uk/check-flooding

The map below shows the current risk of flooding from rivers and the sea. This takes into the defences that are along the coast and rivers. These defences reduce but do not entirely stop the chance of flooding as they can be overtopped or fail. The maps are based on hydraulic modelling that the Environment Agency undertook.

The maps can be found here https://www.gov.uk/check-long-term-flood-risk, where you can zoom in and examine the risk where you live in more detail.


Risk of Flooding from Rivers and the Sea
High
Low
Medium
Very Low
SOUTH GLOUCESTERSHIRE
PORTISHEAD
BRISTOL, CITY OF
CLEVEDON
NAILSEA
NORTH SOMERSET
WESTON-SUPER-MARE
BATH AND NORTH EAST SOMERSET
SEDGEMOOR
MENDIP

4.0 North Somerset's coast in the future

Sea levels have risen by about 16cm since 1900, but the rate is increasing, according to the Met Office. Sea levels are now rising by 3 to 5.2mm a year - more than double the rate of increase in the early part of the last century. There is uncertainty about how quickly this will continue depending on different carbon emission scenarios. Here in North Somerset, sea levels are predicted to rise between 0.5 and 1.1 metres by 2100, depending on carbon emission scenarios.

To prepare for this, the Environment Agency has a National Flood and Coastal Erosion Risk Management Strategy for England. The strategy sets out a vision of a nation ready for and resilient to flooding and coastal change – today, tomorrow and to the year 2100

Find out more:
https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england--2

North Somerset Council is working with the Environment Agency and other partners to develop short and long-term plans and adapt to current and future hazards.

The coast's future is defined through Shoreline Management Plans, which are produced and implemented by Coastal Groups. Coastal Groups are voluntary groups with significant strategic influence. They do not receive funding from central government but are resourced through various mechanisms generally involving membership contributions. Local authorities, the Environment Agency, Natural England and other interested bodies make up the groups. North Somerset Council is a member of the South West Coastal Group and the Severn Estuary Coastal Group, with the boundary being Anchor Head at Weston-super-Mare.

The Shoreline Management Plans assign one of the following policies to each section of the coast:

Policy	What this means
Advance the line	Actively take steps to move the current coastline and any associated flood defences further out to sea. There are no policies like this in North Somerset.
Hold the line	Actively take steps to maintain the coast and any flood defences in its current location. This may mean improvements to defences in places.

Management realignment	Actively take steps to change the alignment of the coast and associated defences. This could mean moving the location of flood defences and allowing natural erosion.
No active intervention	Natural processes will be allowed to continue. This could mean allowing erosion to take place or allowing dunes to migrate inland.

It is only sometimes possible, or advantageous, to stop natural processes along the coast. The coast of North Somerset is a critical habitat for many species, including rare wading birds in the winter. Climate change and rising sea levels will mean that this important habitat is slowly reducing through what is known as coastal squeeze. This is the loss of natural habitats or deterioration of their quality arising from artificial structures or human actions, preventing the landward movement of those habitats that would otherwise naturally occur due to sea level rise and other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures. Any interventions on the coast must ensure that the natural environment is protected and, where possible enhanced.

The policies along the North Somerset coast are summarised below:

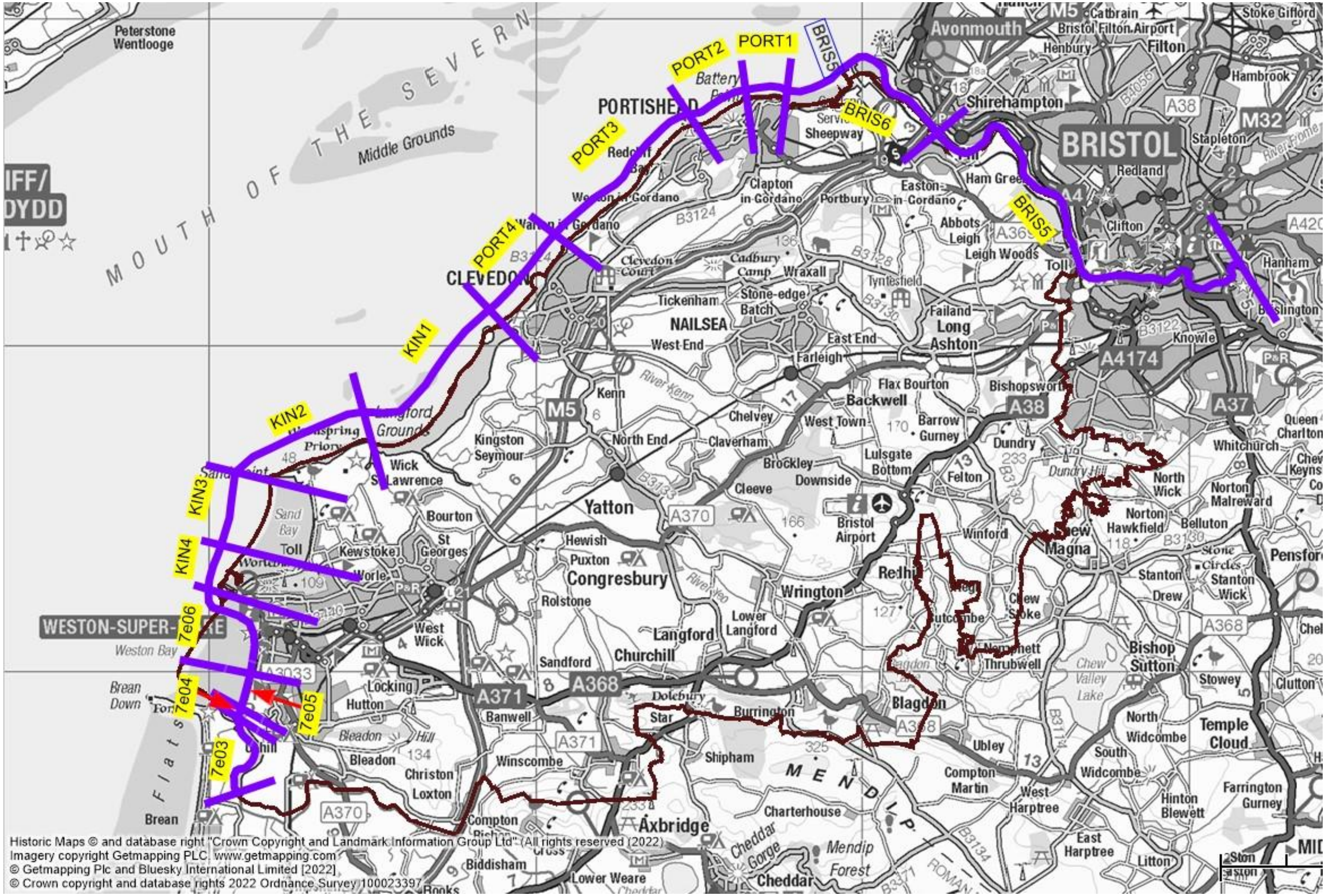
Policy number	Location	Policy for the management of the coast now	Policy for management of the coast in the medium term	Long-term policy target for the management of the coast	Why is this policy in place, and what is the proposed management
7e03	"Axe Estuary right (east) bank (near Diamond Farm to mouth)."	Hold the line	Managed realignment	Hold the line	Continue to maintain existing defences and investigate opportunities for managed realignment. Then implement managed realignment and maintain the set-back position, or if necessary, rebuild the existing flood defences and maintain them.

7e04	Axe Estuary mouth to Uphill	Hold the line	Managed realignment	Hold the line	Continue to maintain existing defences and investigate opportunities for managed realignment. Then implement managed realignment and maintain the set-back position, or if necessary, rebuild the existing flood defences and maintain them.
7e05	Uphill to Weston-super-Mare (south)	Managed realignment	Managed realignment	Managed realignment	Allow natural coastal evolution to continue as far as possible, undertaking dune monitoring and management when required. If monitoring identifies that the dunes are at risk of breaching, then construct a secondary defence embankment.
7e06	Weston-super-Mare	Hold the line	Hold the line	Hold the line	Minimise the risk of flooding and erosion to Weston-super-Mare by maintaining and improving defences.
KIN4	Southern end of Beach Road, Kewstoke to Birnbeck Island, Weston-super-Mare	No active intervention	No active intervention	No active intervention	Allow natural processes to continue.
KIN3	Middle Hope car park at Sand Point to the southern end of Beach Road, Kewstoke	Hold the line	Hold the line	Hold the line	Continued monitoring and maintenance of existing sand dune defences to continue to protect the wider community and consider issues of coastal squeeze and options for mitigating future flood risk, habitat requirements and future adaptation.

KIN2	St Thomas' Head to Middle Hope car park at Sand Point	No active intervention	No active intervention	No active intervention	Allow natural processes to continue.
KIN1	Old Church Road, Clevedon to St Thomas' Head	Managed realignment – set back defence	Managed realignment – set back defence	Managed realignment – set back defence	Whilst ensuring the impacts of flooding to people, property and infrastructure are reduced, the long-term plan is to allow the natural processes of the estuary to continue. Adaptation with time scales determined by actual sea level rise.
PORT4	Ladye Point to Old Church Road, Clevedon	Hold the line	Hold the line	Hold the line	Continued monitoring and maintenance of existing defences and infrastructure to continue to protect the wider community and consider options for future adaptation.
PORT3	The end of Esplanade Road at Lake Road to Ladye Point	No active intervention	No active intervention	No active intervention	Allow natural processes to continue, but in the event that infrastructure or the England Coastal Footpath come to be at risk, local measures could be considered to protect vulnerable assets.
PORT2	Swimming pool, Esplanade Road, Portishead to the end of Esplanade Road at Lake Road, Portishead	No active intervention	No active intervention	No active intervention	Allow natural processes to continue, but in the event that infrastructure or the England Coastal Footpath come to be at risk, local measures could be considered to take account of issues, including those relating to coastal squeeze, future flood risk and habitat requirements, and protection of vulnerable assets.

PORT1	Portishead Pier to swimming pool, Esplanade Road, Portishead	No active intervention	No active intervention	No active intervention	Allow natural processes to continue, but in the event that infrastructure or the England Coastal Footpath come to be at risk, local measures could be considered to protect vulnerable assets.
BRIS6	Avon Road, Easton-in-Gordano (south bank of the River Avon) to Portishead Pier	Hold the line	Hold the line	Hold the line	Continued monitoring and maintenance of existing defences and infrastructure to continue to protect the wider community and consider options for future adaptation.
BRIS5	Netham Weir to Avon Road, Easton-in-Gordano	Hold the line	Hold the line	Hold the line	Continued monitoring and maintenance of existing defences and infrastructure to continue to protect the wider community and consider options for future adaptation.
HOL2	Steep Holm	No active intervention	No active intervention	No active intervention	Allow natural processes to continue.

The location of the policy units is shown in **Figure 2** below.



When improvements to defences are needed, funding will be sought from central government where possible. Opportunities for nature-based solutions, such as increasing salt marsh areas and tidal wetlands and allowing space for sand dune protection, will be considered along with all other alternatives before new hard flood defences are chosen during the investigation and development of options.

The current timeline of future areas of activity along the North Somerset Coast is shown in **Figure 3** below This is dependent on funding being available in the future, and the further into the future you look, the activity become more uncertain regarding the exact timing and extent of what that project may be. All projects will start with a study looking at the needs along the coast and the possible future interventions.

Figure 3 - North Somerset coastal activity and future studies