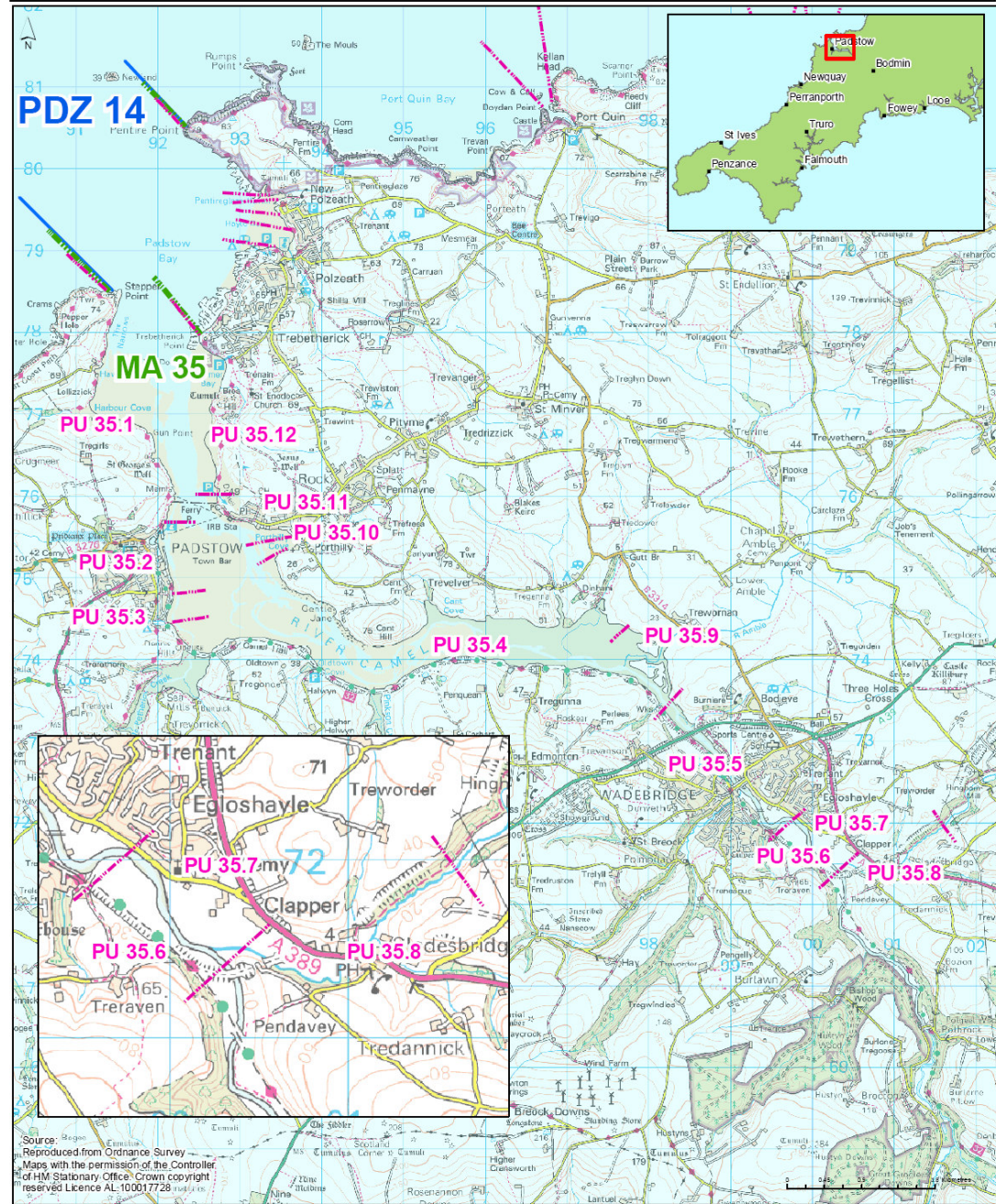


Location reference: Camel Estuary (Stepper Point to Trebetherick Point)
Management Area reference: MA35
Policy Development Zone: PDZ14

Policy Development Zone 14 - Camel Estuary (Stepper Point to Pentire Point)
 Management Area 35 - Camel Estuary (Stepper Point to Trebetherick Point)

Key
 Policy Development Zone
 Policy Units
 Management Areas



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Cornwall & Isles of Scilly
Shoreline Management Plan Review

CORNWALL COUNCIL
 Cornwall and the Isles of Scilly
Coastal Advisory Group
www.cisag.org
 ROYAL HASKONING

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The key value of this area is the interaction of the communities with the scenic estuarine and coastal environment predominantly through tourism and recreation, but also for the traditional commercial activities of sea and shell fisheries.

The overarching management principle is to allow the natural evolution of the coast while recognising the need to support the adaptation and resilience of the coastal and estuarine settlements through reducing flood risks and maintaining recreational and amenity facilities (within the context of the natural amenity value of the area). Importantly however, the overall management of the estuary should be prioritised around the internationally important habitats for which it is designated.

In general flood risk is the major concern within this Management Area. Areas at risk of erosion do exist, however in the main the coast and estuary frontage is expected to remain largely stable. This is however somewhat dependent on the position of the main channel, which may change in the future, although it is not possible to predict when or if the channel might migrate.

The key areas for detailed consideration within this Management Area are Padstow, Wadebridge, Sladesbridge, Rock and Polzeath. Outside of these areas the coast and estuary frontage is characterised by hard rock, steeply rising cliffs meaning that the erosion will be limited and at a very low rate, with little flood risk expected.

Hawkers Cove is a possible exception to this; The sand dunes at Hawkercove have been accreting, this trend is predicted to continue unless the main channel shifts to the west side of the estuary in which case the dunes would erode. However it is impossible to predict when or if the channel might migrate

Some flood risk could be expected on the Central Camel Left Bank affecting the Camel trail. In addition where the trail passes over tidal creeks, localised maintenance of the trail could be required to maintain the route.

A policy of No Active Intervention for these undefended sections of coast and estuary will continue the present approach to managing these areas and best meet the objectives of the AONB and heritage coast designations. Access along the left bank of the estuary is continuous from Upstream of Wadebridge to Stepper Point, through the Camel Trail and the SW Coast Path. The continuity of access along this most scenic estuary is the key tourist driver in this area, supporting the economies of Padstow and Wadebridge. The SAC designation for the River Camel, above Wadebridge must also be considered.

Ensuring the resilience of the key settlements to flood risk is the key issue to address, with erosion at Rock and Porthilly also requiring consideration.

Padstow

The Padstow frontage is at present defended by a combination of seawalls, quay walls, harbour walls and a lock gate leading into Padstow Harbour. A channel connecting the harbour to the main channel is currently maintained.

Under a NAI policy, by 2105, although the sea wall to the south of the harbour is expected to have failed erosion rates will be low due to the underlying geology and large intertidal area. The harbour structures would be expected to be in a deteriorating state with commercial operations no longer possible, however the position of the shoreline fronted by the harbour and quay walls would be unchanged from the current position.

The level of flood risk at Padstow is reasonably significant with residential and commercial properties currently defended by the existing defences. This includes a significant number of listed buildings within the Padstow Conservation Area.

The commercial heart of Padstow is located in and around the harbour, which is the most vulnerable flood risk location. Although tourism is an increasingly important commercial activity in Padstow, commercial fishing and shell fish operations continue to operate, as well as sand extraction activity. All of these commercial activities are dependent on the continuing presence of the harbour and connecting navigation channel being maintained.

The harbour walls are listed structures and are the key to Padstow's historic and future identity.

The preferred plan for Padstow is therefore to hold the line through all epochs in order to sustain the commercial and historic heart of the community. Holding the line is likely to be justified both economically and through meeting a number of both high level objectives and locally issue driven objectives including:

- To support the viability and core values of coastal settlements, in a manner consistent with the Government's sustainable development principles

Management of flood risk over the three epochs will be crucial to achieving this objective. Further studies may be required to determine the approach to reducing risk to life and mitigating the impacts of tidal flooding. This could include raising of crest levels, improving flood warning arrangements and helping the community become more resilient to flooding.

Padstow South (Dinas)

This area south of Padstow harbour extends to Dennis Cove. The immediate estuary frontage is made up of a large intertidal extent and a narrow rocky foreshore with high elevation land backed by hard geology. The rising land is covered by high density residential development, with the Camel Trail immediately below this, linking to Padstow. Towards the harbour there are a small number of commercial properties and slipway access to the estuary used for recreation and by community organisations.

Due to the hard geology of this section, it is currently defended, under a NAI scenario and the the position of the frontage is not expected to change by 2105. In addition only a very small number of properties (3 commercial properties and a car park) are expected to be at flood risk by 2105.

There is a small section of Conservation Area within the northern section of this Management Area, however there are no Listed Buildings present.

It is therefore suggested that the preferred plan for Padstow South (Dinas) is to continue with a policy of no active intervention for the first, second and third epochs. Flood risk mitigation measures will need consideration for the commercial properties and car parking facilities. This management approach best meets the high level objectives to:

- Allow the natural evolution of the shoreline wherever possible
- establish a long-term action plan which helps to minimise and reduce the reliance on defences in the future

Exposure of the residential area to erosion and access along the Camel Trail is not expected to be compromised by the preferred policy, however a period of monitoring of shoreline change would be recommended once NAI came into effect during the second epoch.

Wadebridge is a thriving market town of which the River Camel is the town's most notable feature. A huge amount of value is placed on the waterside areas; historically as a working environment, and today with the Camel Trail running alongside as a key amenity and tourist feature.

The magnitude of the flood risk at the town is the key concern. The main area of flood risk is to parts of the town centre, which includes community and commercial buildings, a significant number of residential dwellings and the pedestrian and vehicular access across the town from some residential area.

Wadebridge currently has a tidal flood alleviation scheme in place to reduce flood risk from the tidal River Camel, made up of embankments, flood walls and steel sheet piled walls. Access to the tidal river for commercial boat industries which still operate on the right bank of the river is maintained by slipways with movable flood gates.

In addition, the scheme also provides a tidal barrier for the Polmorla River, preventing tidal water entering the channel, with a pumping station to reduce the risk of fluvial flooding on this watercourse through tide-locking. The flood alleviation scheme requires significant maintenance including regular grass cutting and includes the recent major operation to recoat the sheet piling to mitigate against accelerated low water corrosion caused through the saline water.





The standard of the existing scheme has been shown to be less than a 1 in 200 year standard; however the actual protection afforded by the scheme is unclear. The alleviation scheme will need to be maintained and upgraded if the present standard of defence is to be maintained into the future, with further investment needed if an improvement in the scheme standard is sought.

There has been some waterside residential development on the left bank of the river Camel, and alongside the Polmorla River over the last decade with pressure for more waterside development likely.



A significant part of the Conservation Area is at flood risk; with two Listed Buildings/structures within the expected zone of flooding by 2015. This includes the multi-arched Wadebridge Bridge which is Grade II Listed. There are also over 10 Scheduled Monuments at flood risk. There are no other heritage or environment designations in the town. The sewage treatment works downstream of the town is also at risk of flooding.

The intended plan is therefore to manage the flood risk through a policy of hold the line, whilst making reference to the statement of management set out for Wadebridge within the East Cornwall CFMP. Since the standard of protection from the defences can not be guaranteed into the future, and given the impacts of deep and sudden inundation in the event of overtopping of the defences, development of resistance and resilience to flooding of property and infrastructure behind the defences is needed. This should be addressed by the Local Development Framework, and the Town Strategy, and supported by appropriate emergency planning.

This approach meets the following objectives:

- To support the viability and core values of coastal settlements, in a manner consistent with the Government's sustainable development principles
- To manage the risks to communities from flooding and support their adaptation and development of resilience
- And minimise impacts upon the historic environment, without unduly preventing natural coastal processes

Egloshayle (left bank)

This area starts from the Camel trail at Guineaport Road and extends south eastwards along the left bank of the River Camel to the confluence with the River Allen. This is an area of grazing land which is protected by embankments running the length of the River Camel. This area has been identified as an area of possible Managed Realignment which could increase floodplain storage upstream of Wadebridge. Increasing floodplain storage could help reduce flood risk in the event of high river flows combined with high tides. An existing project is being lead by the Environment Agency to reintroduce regular flooding to these fields to create salt-water grazing marsh. This has been achieved through the recreation of culverts through the floodbanks which allow water into the fields in a controlled manner during spring tides.

The Camel Trail runs alongside these fields and is at risk of tidal flooding.

The intended plan is therefore to hold the line for the first epoch, with then managed realignment to take place during the 2nd and 3rd epochs. This approach will allow the current project to reintroduce salt-water grazing marsh to this area to become established and habitat monitoring to take place, with the existing defences largely intact. During epoch 2, the existing defences would be allowed to fail gradually, introducing a more frequent flooding regime to the area on a gradual basis. This would create priority BAP habitat.

It is unlikely that the Camel Trail can be rerouted along this section, as it follows the lines of the old railway. Although it is at flood risk now, it will be come at increasingly frequent flood risk by the 3rd epoch and flood resilience measures for the trail may be required in order to maintain the continuous link from Bodmin Moor through to Padstow.

This management approach meets the following objectives:

- To support existing nature conservation values and minimise impacts upon habitats, while allowing adaptive response to natural change
- To support and allow diversification of tourism and recreational opportunities
- To establish a long-term action plan which helps to minimise and reduce the reliance on defences in the future

Egloshayle (right bank)

This area is directly opposite Egloshayle left bank and runs from part way down Egloshayle Road to the confluence of the River Camel with the River Allen. This

area is partly settled, with the community of Egloshayle developed alongside the River Camel, including the largely Medieval Egloshayle Church, and also includes a small number of properties at Clapper. This area is within the Conservation Area with a significant number of Listed Buildings and structures, many of which are centred around the church yard at Egloshayle Church. The most direct access road from Egloshayle into Wadebridge runs directly alongside the river at this point.

The numbers of properties which are currently at risk of flooding from an event of less than 1 in 200 years return period in this policy unit will increase with sea level rise.



Although historically the village of Egloshayle was distinct from Wadebridge, over time the communities have been linked by development alongside the River Camel and are now considered integral. As part of the recently (2004) constructed flood defence scheme at Sladesbridge, a series of banks were constructed landward of the old existing banks, alongside the main road and along the bank at Clapper where there are properties at risk. The Environment Agency are progressively making the old banks more permeable and are encouraging the development of improved intertidal habitat which will support UK BAP habitat targets.

The intended plan is therefore to manage the flood risk through a policy of hold the line, whilst making reference to the statement of management set out for Wadebridge within the East Cornwall CFMP. The hold the line strategy will apply to the line of defence established by the new defences, as described in the paragraph above. Since the standard of protection from the defences can not be guaranteed into the future, and given the impacts of deep and sudden inundation in the event of overtopping of the defences, development of resistance and resilience to flooding of property and infrastructure behind the defences is needed. This should be addressed by the Local Development Framework, and the Town Strategy, and supported by appropriate emergency planning.

This approach makes the policy consistent with the plan for Wadebridge and meets the following objectives:

- To support the viability and core values of coastal settlements, in a manner consistent with the Government's sustainable development principles
- To manage the risks to communities from flooding and support their adaptation and development of resilience

- And minimise impacts upon the historic environment, without unduly preventing natural coastal processes

Sladesbridge

This area extends from the confluence of the River Camel with the River Allen, upstream, along the River Allen to include the small community of Sladesbridge. This stretch of the River Allen is tidal, and has a flood alleviation scheme throughout this section, consisting of natural banks with maintained channel, and raised walls and embankments. The scheme alleviates flood risk at Sladesbridge and Clapper from tidal and fluvial risk, in isolation or in combination. The flood alleviation scheme provides protection to around 16 properties and one Grade II Listed Building, as well as the A389 road between Wadebridge and Bodmin.

The River Camel SAC of international importance is present throughout this area, as is the River Camel Valley and Tributaries SSSI.

The flood alleviation scheme constructed at Sladesbridge in 2004 is considered to have a residual life in excess of 20 years. Therefore the defences would be expected to be operational and well maintained into the second epoch. There is little scope for realignment through the village; however investigation into the benefit of realigning defences downstream of the village to the confluence with the River Camel should be investigated. The preferred plan would involve holding the line during epoch 1 and continuing to hold the line on a localised basis during epochs 2 and 3 (relating to position of current defences) whilst the Land Use Planning System should allow for the identification of areas for wider managed realignment during epochs 2 and 3. Increasing community resilience to flooding is also going to be a key aspect of the strategy to manage the flood risk at Sladesbridge as the risk will increase through time with climate change.

This approach meets the following objectives;

- To support the viability and core values of coastal settlements, in a manner consistent with the Government's sustainable development principles
- To manage the risks to communities from flooding and support their adaptation and development of resilience
- To support existing nature conservation values and minimise impacts upon habitats, while allowing adaptive response to natural change

Amble Marshes

The River Amble flows through the village of Chapel Amble and discharges into the Camel estuary at Amble Marshes. The presence of a tidal barrier at the discharge point provides some protection from flooding however the barrier is stated to have only a 1 in 10 year standard of protection for the village from tidal flooding. Sea level rise will dictate that this current level of protection will rapidly diminish to a point where the barrier is overwhelmed annually by the largest spring tides. By 2105, under a scenario of no active intervention, it is expected that around ten properties could be at risk of tidal flooding in the village, including the site of St Adhelms Chapel, a Grade II Listed Building, and Trewornan Bridge which is a Scheduled Monument and a Listed Building.

Amble Marshes is a SSSI designated for its variety of wetland habitats and number of overwintering birds and due to the presence of the tidal barrier is a freshwater habitat which is largely pasture land grazed by sheep. The river channel has been straightened and is maintained from downstream of the village to the barrier. Due to the current unfavourable condition of the site caused partly by low groundwater levels, the Environment Agency is currently consulting on options for improving the SSSI.

The intended plan for this area is to hold the line for the first epoch to allow the ongoing Environment Agency project to take place, with a no active intervention approach adopted from the 2nd epoch and into the 3rd epoch. Flood risk at Chapel Amble will need to be considered with the improving the resilience and adaptation of the community a priority over these epochs. This approach allows the shoreline to behave naturally in this location and would return Amble Marshes to salt water grazing marsh, which is a BAP priority habitat.

Consideration of flood risk to the B3314 which is the main access road from the coast at Polzeath into Wadebridge, and heavily used by tourist traffic in the summer would need to be considered however, there are other longer routes currently available.

This approach meets the following objectives:

- To manage the risks to communities from flooding and support their adaptation and development of resilience
- To allow natural evolution of the shoreline wherever possible
- To establish a long-term action plan which helps to minimise and reduce the reliance on defences in the future
- To support existing nature conservation values and minimise impacts upon habitats, while allowing adaptive response to natural change

Porthilly Cove and Rock

Rock is a community which extends inland from the estuary shoreline, with recreational pursuits of sailing and windsurfing closely associated with the community identity. A number of slipways and the sailing club provide access to the shoreline, with a passenger ferry and water taxis operating to link the community to Padstow. It is a very popular tourist and second home location.

There are some defences along the south facing shoreline of Rock, but none within Porthilly Cove. There are piles of rock on Rock Beach to the south west of Rock, with a rock groyne at the east end of the beach. To the east of the groyne there is further rock armouring and to the east again there is an area of seawall around the sailing club and immediately to the east.



Under a scenario of now active intervention some erosion would be expected which historically has been linked to the position of the main estuary channel. Depending on the future migration of the estuary channel, which is impossible to predict, erosion could be in the order of 130 metres at the beach to the west. Some erosion to the south facing Rock frontage would also be possible, however this will be low due to hard rock. Porthilly Cove is likely to remain stable or continue to accrete. There is also some flood risk at Rock, affecting around 5 properties including Rock Sailing Club House which is Grade II Listed.

The intended plan for Porthilly Cove itself is no active intervention over the three epochs as there are no defences currently present, and little future flood or erosion risk anticipated. This management approach meets the following objectives:

- To allow natural evolution of the shoreline wherever possible

The intended plan for **Rock**, from and including the existing defences to the east of the Sailing Club to the end of the coast protection structure at the start of Rock Dunes is hold the line for the first epoch, with managed realignment in the second and third epochs. Managed realignment will allow a more sustainable shoreline position to be achieved along the Rock frontage, with the hold the line policy in the first epoch allowing the important estuary access points and buildings associated with the RNLI and sailing and recreational activities to be moved to sustainable positions. This management approach meets the following objectives:

- To allow natural evolution of the shoreline wherever possible
- To support the viability and core values of coastal settlements, in a manner consistent with the Government's sustainable development principles
- To support and allow diversification of tourism and recreational opportunities
- To manage the risks to communities from erosion and support their adaptation
- To manage the risks to communities from flooding and support their adaptation and development of resilience

Rock Dunes and Daymer Bay

This area extends from the eastern end of the coast protection structure running through Rock, to include Daymer Bay to Trebetherick Point. Much of this area is designated as Rock Dunes geological SSSI and there are also biological SSSI interests along this frontage. This area is undefended and backed by hard rock cliffs with historically little change, low rates of erosion are therefore anticipated to 2105.



There are no assets at risk of flooding or erosion other than a small number of Scheduled Monuments, one of which includes the Rock Ferry landing stage. This area is a popular amenity dune and beach area and in part forms the SW coast path.

The geomorphology and behaviour of the frontage is driven primarily by tidal currents but wind driven accretion on the dunes is important as are the impacts of wave energy on the upper foreshore, particularly on the more prominent frontage of Brea Hill. Monitoring should look to identify any longer term trends of erosion along the Rock Dunes – Daymer Bay frontage and consideration should be given to the preferred plan at Rock where defences will be present along the frontage under first a hold the line approach and then more latterly a managed realignment policy. Any potential links are thought to be minimal but this should be tested through the monitoring programme.

The intended plan therefore for this area is no active intervention for all three epochs. This meets the following objectives:

- To support the essential diverse character of the landscape & seascape of Cornwall and the Isles of Scilly
- To allow natural evolution of the shoreline wherever possible
- To establish a long-term action plan which helps to minimise and reduce the reliance on defences in the future
- To support existing nature conservation values and minimise impacts upon habitats, while allowing adaptive response to natural change



The economic assessment for Management Area 35 provides a below unity benefit / cost ratio of 0.4. This indicates the requirement to look to more economically sustainable approaches to manage the shoreline where possible but also reflects the very significant length of defences which are present within the estuary in this area - refer to Economics Appraisal Summary Table below and Appendix H for more detail on the assessment.

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION PLAN:

Location reference:	Camel Estuary (Stepper Point to Trebetherick Point)
Management Area reference:	MA35
Policy Development Zone:	PDZ14

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day (0-20 years)	NAI along the undefended cliffs and estuary banks. HTL at Padstow Harbour. NAI along the Dinas frontage. NAI along the central Camel left bank. HTL at Wadebridge. HTL along Egloshayle left bank. HTL along Egloshayle right bank. HTL at Sladesbridge. HTL at Amble Marshes. NAI at Porthilly Cove. HTL at Rock. NAI along Rock Dunes and Daymer Bay frontage.
Medium term (20-50 years)	NAI along the undefended cliffs and estuary banks. HTL at Padstow Harbour. NAI along the Dinas frontage. NAI along the central Camel left bank. HTL at Wadebridge. MR along Egloshayle left bank. HTL along Egloshayle right bank. MR (with localised HTL) at Sladesbridge. MR at Amble Marshes. NAI at Porthilly Cove. MR at Rock. NAI along Rock Dunes and Daymer Bay frontage.
Long term (50 -100 years)	NAI along the undefended cliffs and estuary banks. HTL at Padstow Harbour. NAI along the Dinas frontage. NAI along the central Camel left bank. HTL at Wadebridge. MR along Egloshayle left bank. HTL along Egloshayle right bank. MR (with localised HTL) at Sladesbridge. MR at Amble Marshes. NAI at Porthilly Cove. MR at Rock. NAI along Rock Dunes and Daymer Bay frontage.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		SMP1 Policy	SMP2 Policy Plan			Comment
		50 yrs	2025	2055	2105	
35.1	Undefended cliffs and estuary banks	Do Nothing	NAI	NAI	NAI	This approach best meets the management intent of allowing the natural evolution of the coast and the objectives of the AONB and Heritage Coast designations.
35.2	Padstow Harbour	Hold the existing defence line	HTL	HTL	HTL	This approach best meets the objective to maintain the viability and core values of coastal and estuary communities.
35.3	Padstow south (Dinas)	Hold the existing defence line	NAI	NAI	NAI	This approach best meets the objectives to allow the natural evolution of the shoreline wherever possible and establish a long-term action plan which helps to minimise and reduce the reliance on defences in the future
35.4	Central Camel left bank	<i>Not considered in SMP1</i>	NAI	NAI	NAI	This approach best meets the management intent of allowing the natural evolution of the coast and the objectives of the AONB and Heritage Coast designations. Camel Trail may need localised realignment.

Policy Unit		SMP1 Policy	SMP2 Policy Plan			Comment
		50 yrs	2025	2055	2105	
35.5	Wadebridge	<i>Not considered in SMP1</i>	HTL	HTL	HTL	This approach best meets the objective of supporting the viability and core values of coastal settlements and minimizing impacts on the historic environment, flood resilience will be an important part of this plan.
35.6	Egloshayle left bank	<i>Not considered in SMP1</i>	HTL	MR	MR	This approach best meets the objective of supporting existing nature conservation values, while allowing adaptive response to natural change, and reduces reliance on defences.
35.7	Egloshayle Right Bank	<i>Not considered in SMP1</i>	HTL	HTL	HTL	This approach best meets the objective of supporting the viability and core values of coastal settlements and minimizing impacts on the historic environment, flood resilience will be an important part of this plan.
35.8	Sladesbridge	<i>Not considered in SMP1</i>	HTL	MR (with localised HTL)	MR (with localised HTL)	This approach best meets the objectives to support coastal communities, with an emphasis on increasing flood resilience, and supports nature conservation values by allowing adaptive response to natural change. Identification of realignment which can provide flood storage areas may provide habitat creation opportunities. Localised HTL will maintain the flood defence scheme built in 2004. This is considered to have in excess of 20 year residual life.
35.9	Amble Marshes	<i>Not considered in SMP1</i>	HTL	MR	MR	This approach meets the objectives of allowing the natural evolution of the shoreline, and minimises the reliance on defences in the future, while supporting nature conservation values and allow habitats to respond to climate change.
35.10	Porthilly Cove	Hold the existing defence line	NAI	NAI	NAI	This approach allows the natural evolution of the shoreline, flood resilience for a small number of properties currently at flood risk will need consideration as risks are increased with sea level rise.

Policy Unit		SMP1 Policy	SMP2 Policy Plan			Comment
		50 yrs	2025	2055	2105	
35.11	Rock	Hold the existing defence line	HTL	MR	MR	This approach allows the objectives of supporting coastal communities and recreation and tourist opportunities, while managing erosion and flood risks in a sustainable manner, with flood resilience required as flood risks increase with sea level rise.
35.12	Rock Dunes and Daymer Bay	Do nothing to conserve dune habitats and species	NAI	NAI	NAI	This approach best meets the objectives of allowing natural change and supporting nature conservation values, with little change to the position of the shoreline expected over the three epochs.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment						

ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA):

For the Camel Estuary, the long-term policy plan is for NAI along the undefended cliffs and estuary banks with HTL and MR used selectively at settlements to maintain current standards of defence for settlements of the Camel Estuary and continued protection of numerous Listed Buildings. The NAI policy will benefit various designated sites reliant on natural processes including Harbour Cove and Steeper Point SSSI, Rock Dunes SSSI, Trebetherick Point SSSI, Stepper Point RIG site and Cornwall AONB (Camel Estuary). However within Daymer Bay the policy may cause partial loss of community assets in response to erosion including the golf course, access roads, church and the following Listed Buildings: Quay to West; South and East Rock Sail (LB); and Rock Sailing Club House. Monitoring should be undertaken.

The majority of the sites associated with HTL and MR are located some distance from the River Camel SAC boundary and do not directly or indirectly affect the Site's features. Sladesbridge is the only policy location within the SAC boundary and has the potential to result in direct loss of SAC interest features, however, the combined policy of HTL/NAI for Epochs 2 and 3 and the description of the policy indicate that there would be no direct loss, as a result of HTL intervention, of any habitats within the SAC.

Habitat Regulations Assessment (HRA):

HTL is proposed at Padstow Harbour, Wadebridge, and Egloshayle (right bank) for all three Epochs, whilst HTL is proposed in the first Epoch at Egloshayle (left bank), Sladesbridge, Amble Marshes, Rock, and Polzeath followed by MR in Epochs 2 and 3. All policy locations are at least 16km from the Tintagel-Marsland-Clovelly Coast SAC, therefore no direct or indirect effects are expected. The majority of the sites are located some distance from the River Camel SAC boundary and do not directly or indirectly affect the Site's features. Sladesbridge is the only policy location within the SAC boundary and has the potential to result in direct loss of SAC interest features, however, the combined policy of HTL/NAI for Epochs 2 and 3 and the description of the policy indicate that there would be no direct loss, as a result of HTL intervention, of any habitats within the SAC. Though NAI may result in

increased flooding during extreme events (combined tidal and fluvial) this is not expected to affect the extent or character of the Site's interest features. Any potential effects of MR schemes will be avoided by incorporating fluvial modelling and geomorphological assessment into scheme design.

Clarification of preventative and mitigation measures has resulted in a finding of no adverse effect on integrity of the Site's qualifying features.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics Summary		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages (£k PV)	4627.1	2715.8	943.4	8286.3
	Preferred Plan Damages (£k PV)	462.7	264.1	94.3	821.1
	Benefits of preferred plan (£k PV)	4164.4	2451.7	849.0	7465.2
	Costs of Implementing plan (£k PV)	10390	5202	5006	20598
				Benefit/Cost ratio of preferred plan	0.4

Notes

Below unity B/C ratio may be improved when traffic losses included. Long linear defences and high flood risk make economic justification alone difficult - but important to recognise that Wadebridge is a major town with significant population at increasing risk of flooding.