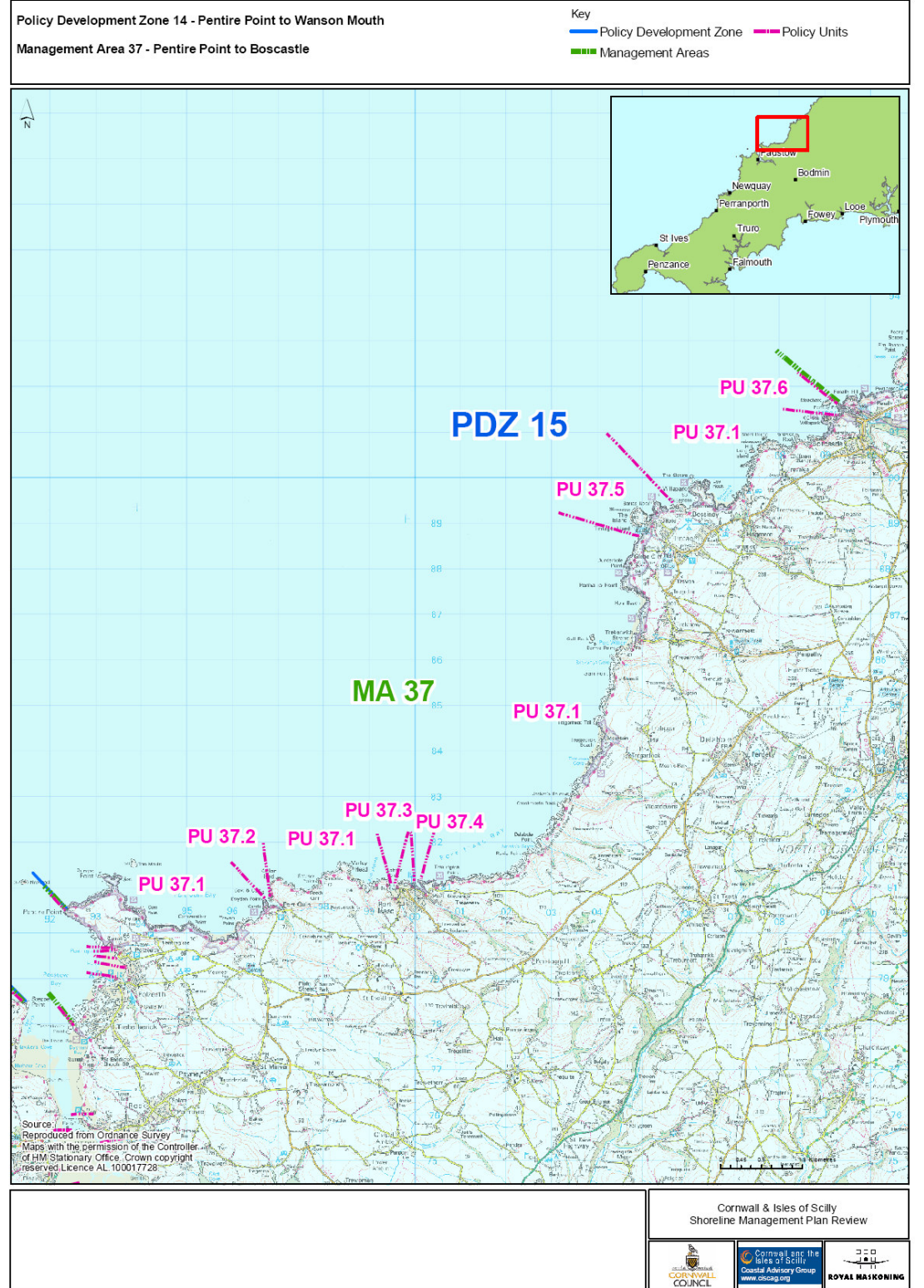


Location reference: Pentire Point to Boscastle
Management Area reference: MA37
Policy Development Zone: PDZ15



DISCUSSION AND DETAILED POLICY DEVELOPMENT

The majority of this frontage is undefended, open coast cliffs. The cliffs are valued for their geology and coastal maritime slope habitats they provide. The majority of the cliff frontage is covered by the Cornwall AONB designation, the Pentire Point to Widemouth Heritage Coast designation and designations for the Pentire Peninsula SSSI, Tintagel Cliffs SSSI and Boscastle to Widemouth SSSI.

There are some historic interests in the cliff edge slate quarries which occur intermittently, however these are generally thought to be stable and not at elevated risk. **Rumps Castle** situated at Rumps Point, north-east of Pentire Point and on the western edge of Port Quin Bay, is not identified as being at particular risk, but ongoing natural erosion or potential isolated cliff falls may provide some need for mitigation in the future. Although recognised as an important site, it is not felt necessary to alter the current management approach set by SMP1 of do nothing, and this would be continued as no active intervention through SMP2. Therefore the Rumps Point area would be managed as a non-interventional frontage, in common with the remainder of the open coast undefended cliffs within the management area. This would not preclude local management or mitigation works taking if and when it is deemed necessary by the relevant heritage bodies.

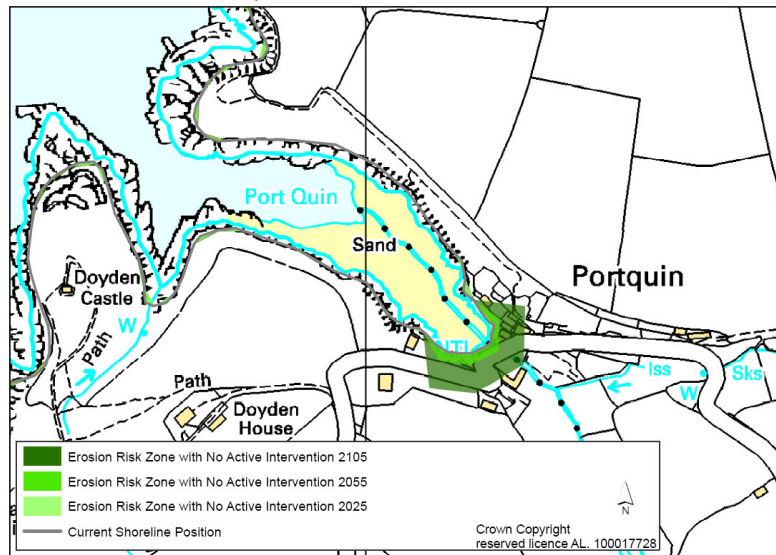


Included within this policy unit covering the undefended coast (37.1) is **Trebarwith Strand**, (inset photo, left), one of the only significant beach areas between Pentire Point and Widemouth (PDZ16). It is therefore relatively well-used by both holiday makers and the local population, for a variety of recreational purposes, including its role as a popular surf spot. The Trebarwith Stream is a designated RIG

site. Due to the steeply rising topography and lack of rear beach development (development is located in a linear fashion following the beach road back up the Trebarwith valley), there are no erosion or flood risks identified to assets at Trebarwith Strand which dictate a necessity for a different policy to the adjacent cliffed sections. Therefore it is included within the same unit under the policy of no active intervention. It should however be noted that natural constraint of the upper beach and shoreline position by the hard cliffs and rising topography means that sea level rise could lead to some narrowing of the intertidal beach area. This effect could accelerate through epochs 2 and 3 as sea level rise accelerates and causes coastal squeeze. There may be enough contemporary sources of new sediment to the beach to partially offset this impact, but uncertainty surrounding future increased storminess will also need to be considered in identifying how Trebarwith (and other beaches like it on the north coast) respond to a retreating mean low water position with an essentially 'fixed' high water position.

At **Portquin**, the assessment of erosion risks indicates that by 2105 (under the no active intervention scenario) loss of the road and a number of listed properties could occur (see inset map, below). Although this is a limited risk, historic evolution of the elongated funnel shaped inlet at Portquin is most likely to have been due to the lower topography of the small river valley. This geomorphological trend is likely to continue and effects from sea level rise may enhance this. There is minor

development to the rear of the small cove, including retaining wall structures which perform a coast protection function to both properties and the road. These walls are Grade II listed structures. The road itself although important locally as a through route connecting Port Quin with St Minver to the south and several



settlements, including Port Isaac, to the east, is not a strategic route. The slipway and several holiday let properties at Portquin are owned and managed by the National Trust.

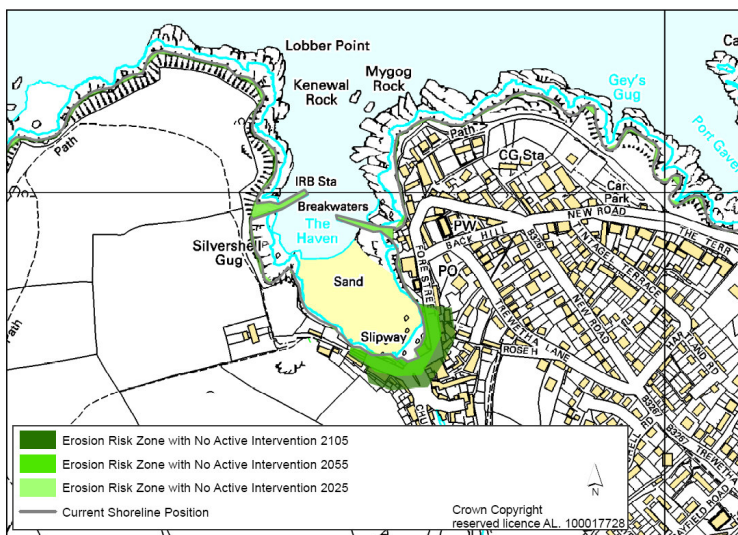
Based upon the risk identified, the preferred plan at Portquin would be to allow the frontage to adapt to sea level rise impacts and the possibility of enhanced erosion through a policy of ongoing managed realignment, but ideally moving to a no active intervention approach by 2105. The National Trust, as partial owners of the frontage favour a management approach which will not constrain natural coastal processes. Under a managed realignment policy, continued surveillance of actual recession rates should be undertaken, as there is significant uncertainty at this location. This uncertainty relates primarily to the very narrow exposure to the dominant westerly wave climate. Should climate change dictate that there is a shift in predominant wind / wave direction of even just a few degrees, this could potentially alter the rates of recession at Portquin. Monitoring and surveillance information should inform a local strategy relating to the listed buildings, the road and slipway. Portquin is completely isolated from the rest of the frontage, given its very recessed nature within the cliff line and therefore any intervention undertaken in order to realign can be done so without any risk of negative impacts upon adjacent sections of the coastline, but it is envisaged that at this location, realignment moving to NAI would not entail any significant works.

Some 3km to the east lays **Port Isaac**. As with Port Quin, Port Isaac is located at the end of a very recessed inlet in the cliff line, eroded out by a small river which issues out through the harbour area. Port Isaac has a more direct northerly exposure to the wave climate and it also benefits from the protection afforded by

harbour breakwaters to the east and west sides of the cove. There are also protection structures defending the settlement along the shoreline. A number of these structures function both as defence and as outer facing and support walls for buildings along the frontage. Although the geology is mainly resistant slate, there are sections of easily eroded, unconsolidated head material and shales. A quite significant inlet is cutting into the cliff on the right hand side of the Bay, adjacent to the eastern breakwater and this may indicate the presence of a weaker fault running through the geology at this point.

As with Portquin, the assessment of erosion risks identifies a no active intervention scenario where a number of properties and a road (Fore Street) are affected (see inset map, below). In fact up to 30 listed buildings could be impacted within the harbour and Fore Street area, along with the harbour structures, walls, slipway and Fore Street itself. The entire Port Isaac harbour area is covered by a conservation area designation which would be heavily affected by such enhanced erosion. Flood risk due to extreme storms and wave run-up also needs to be considered as at present the wide slipway provides a flooding route into the lower part of the town.

Although Fore Street is not a through route, it is locally important for access to property. This in itself would not be justification for holding the line, but the potential damage to the conservation area and heritage interests of Port Isaac would be such as to have a very negative impact on the core values of Port Isaac. It is also felt that there is very limited scope and flexibility within the frontage to undertake a managed realignment approach. Therefore the preferred plan at Port Isaac would be to

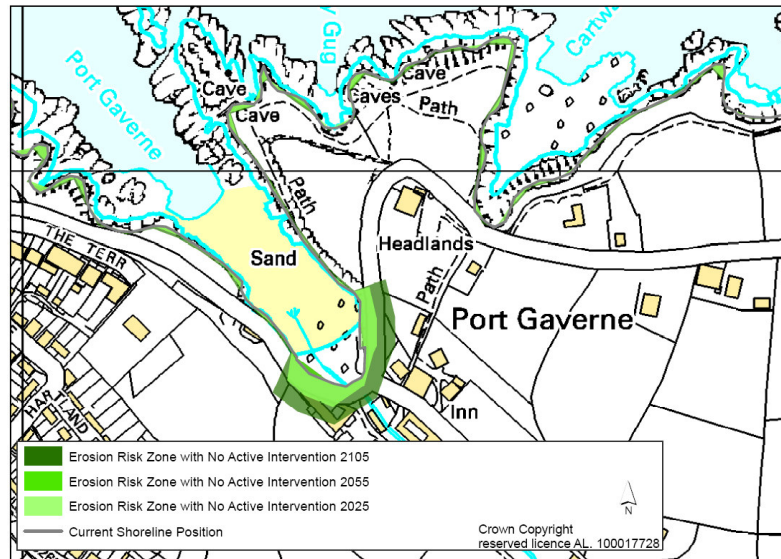


continue with the policy identified within SMP and to hold the line. Again, at Port Isaac, the very recessed nature of the managed frontage dictates that there is no connectivity with adjacent shoreline sections and therefore holding the line would have no negative impacts outside of the Port Isaac policy unit.

Continuation of a hold the line at Port Isaac that allowed continued use of a working harbour would be of benefit to the local economy but would rely on the continued maintenance of the outer breakwaters. Maintenance of the sea walls at the rear of the beach would also be required as part of the overall approach. The shoreline defences at Port Isaac are not owned by Cornwall Council and therefore it is assumed that maintenance of these structures will be privately funded. It is likely that some improvement to the standard of protection will be necessary over time in line with sea level rise and increasing storminess – but it would be necessary to ensure that any future works did not compromise value of the conservation area.

Attention to increasing flood risk via the slipway may dictate works are required to raise the crest level in the future. It would have to be accepted that there may be some narrowing of the intertidal zone between mean low and mean high water positions due to sea level rise. Monitoring of this effect and any subsequent loss of sediment from the foreshore should be taken into account in future reviews of the policy.

Port Gaverne, just to the east of Port Isaac, is another narrow, funnel-shaped cove well recessed into the cliff line due to the presence of a small river valley. It displays a more north-westerly exposure than Port Isaac and has no breakwaters present. There are coast protection walls and three listed buildings at the rear of the beach, with further properties set back into the small, steep sided valley.

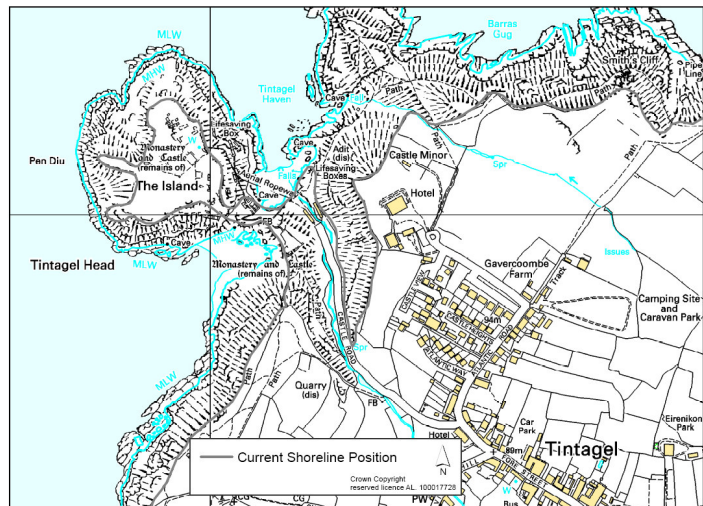


The road which runs east from Port Isaac passes at the back of the beach and is at risk under the 2055 NAI scenario and indeed the 2105 WPM scenario (see inset map above). It seems inevitable at some that the road will be impacted, or potentially lost altogether at some point within 20-75 years. This route although not strategic, is locally important in providing access to the scattered farms and hamlets in the area to the east as well as Port Gaverne itself. Although protection of the route in situ, under a hold the line policy is unlikely to be justified, local transport plans will assess the risk to the road and will act appropriately to ensure that local transport needs are met. The preferred plan would be to manage the risk to the road and the listed buildings through a policy of ongoing active monitoring of the actual rates of retreat and a managed realignment approach, similar in nature to that suggested for Portquin. Again, ideally the SMP would guide management through initial managed realignment toward a no active intervention approach by 2105, having established a robust and sustainable shoreline position. The managed realignment approach is intended to help manage the long term risks in a sustainable manner which is more flexible than a fixed hold the line policy. This may include utilising techniques which provide better attenuation of wave energy and less direct reflection of wave energy to help limit the impacts on the beach itself. Due to its recessed nature, any small scale intervention at Port Gaverne as part of the managed realignment approach would have no coastal process impacts outside of this policy unit.

Tintagel castle is located some 12km to the north-east of Port Isaac and Port Gaverne. There are no fixed defences at Tintagel but the sites commands recognition as one of the most prominent and highest priority heritage sites within the SMP area. It is considered necessary to deal with Tintagel and the future

scenarios at the site as an individual policy unit (37.5). Tintagel has great local, regional and national historical importance and is an iconic location, sitting alongside Pendennis Castle, St Michael's Mount and the Mining World Heritage Site as one of the iconic historical symbols of Cornwall. It attracts many tens of thousands of visitors each year. As such it is also important from a socio-economic point of view, particularly to the local settlements of Tintagel village and Bossiney, but also to the wider north Cornwall area.

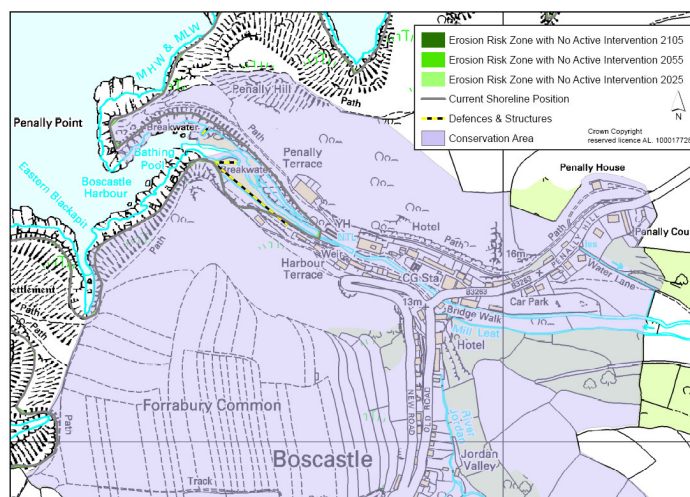
The remains of Tintagel castle and monastery are located on Tintagel Head, also referred to as the 'Island'. Its prominent coastal position dictates that its southern and western facing flanks are very exposed to the dominant westerly Atlantic wave climate (see inset map, right). As such, although the geology is primarily



composed of resistant Devonian slates, the assessment of erosion risks indicates that under the 2105 high scenario, recession of the cliff line could average up to 5 metres. Given that this allows for the occurrence of occasional mass cliff failure of perhaps twice this extent, there are small but identifiable risks to the site along its western and southern flanks. This is mostly of concern in the area of the bridge link between the Island and the mainland (which already displays the evidence of active erosion). Although the preferred policy at Tintagel is to continue with the policy of no active intervention, this should not preclude local works being undertaken to ensure continued access to the site. Use of topographic and photographic survey data from the Regional Coastal Monitoring Programme should form the basis for assessment of future risks and decisions regarding future localised intervention at Tintagel.

Importantly there is not considered to be a technical constraint on local works at Tintagel (although it would require a further detailed study to confirm) and that any impact on adjacent frontages is unlikely, with the closest significant accumulations of sediment at the isolated Dria Cove, Bagalow beach and Hole beach, just south of Lower Penhallic Point, 1.5km to the south.

It is considered that the objectives relating to the Tintagel Cliffs SSSI, the Tintagel-Marsland-Clovelly Coast SAC, the Cornwall AONB designation, and the Pentire Point to Widemouth Heritage Coast designation



will be most closely met by continuing with the NAI policy (not precluding localised management intervention) throughout the three epochs.

The final settlement located on the coastline of MA37 is **Boscastle**, some 5km north-east of Tintagel. The extremely well documented flood of August 2004 tends to define the acknowledgement of flood risk at Boscastle but this was of course a fluvial event. The nature of the settlement at Boscastle (narrow sheltered inlet, steeply rising topography and development not clustered around the harbour but arranged in a linear fashion, following the Valency river valley up the hill to the south-east) dictates that in terms of tidal flood risk and coastal erosion, the future risks are relatively low (see inset map, above).

Although there is some limited propagation of swell and wave energy into the harbour area, the risk from this does not extend much beyond the area around the Grade II listed buildings of Harbour Cottage, Pixie Shop and Penally Terrace, plus the National Trust owned youth hostel. The privately owned harbour walls and breakwaters (see inset picture, right) are Grade II listed also and the whole harbour area is part of the much larger Boscastle conservation area.



The preferred plan at Boscastle would be to maintain the harbour in its operational capacity to assist in maintaining the core values of Boscastle and prevent damage to the historic environment. It is not seen as an unsustainable frontage or shoreline position in the longer term and holding the line should not unduly or negatively impact upon coastal processes either at Boscastle itself or to the detriment of any adjacent frontages. Environmentally it is not thought that this approach would have an adverse influence on the SSSI areas (Tintagel Cliffs SSSI meets Boscastle to Widemouth SSSI at Boscastle Harbour or the Tintagel-Marsland-Clovelly Coast SAC, above and beyond the historical influence of the harbour's presence).

Although the mechanism for funding continued maintenance is not clear (it is assumed that private financing would be made available given the private ownership of the defences) a continued hold the line policy is seen as generally technically, economically and environmentally sustainable. The economics assessment for Management Area 37 provides a benefit / cost ratio of 2.54 based upon the preferred plan to hold the line at Port Isaac and Boscastle and look to longer term managed realignment at Port Quin and Port Gaverne. Refer to the Economics Summary Table below and Appendix H for more detail.

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION PLAN:

Location reference:	Pentire Point to Boscastle
Management Area reference:	MA37
Policy Development Zone:	PDZ15

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day (0-20 years)	NAI along undefended cliff sections, including Trebarwith Strand. MR at Portquin. HTL at Port Isaac. MR at Port Gaverne. NAI at Tintagel. HTL at Boscastle.
Medium term (20-50 years)	NAI along undefended cliff sections, including Trebarwith Strand. MR at Portquin. HTL at Port Isaac. MR at Port Gaverne. NAI at Tintagel. HTL at Boscastle.
Long term (50 -100 years)	NAI along undefended cliff sections, including Trebarwith Strand. Move to NAI at Portquin. HTL at Port Isaac. Move to NAI at Port Gaverne. NAI at Tintagel. HTL at Boscastle.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		SMP1 Policy	SMP2 Policy Plan			Comment
		50 yrs	2025	2055	2105	
37.1	Undefended Cliffs	Do nothing	NAI	NAI	NAI	Meeting objectives of AONB, Heritage Coast and 3 SSSI designations. Including Trebarwith Strand (monitor for coastal squeeze effects).
37.2	Portquin	Hold the line	MR	MR	NAI	Possible realignment of road during epoch 2. Manage risk to listed properties through MR. Eventual aim to establish robust NAI position.
37.3	Port Issac	Hold the line	HTL	HTL	HTL	Very significant implications for historic area dictate preference for HTL. No implications from local HTL for adjacent undefended frontages.
37.4	Port Gaverne	Hold the line	MR	MR	NAI	Manage risk to listed properties and the road through MR. Eventual aim to establish robust NAI position but some local intervention is likely to remain as this will have no implications for adjacent policy units.
37.5	Tintagel	Do nothing	NAI	NAI	NAI	NAI does not preclude local management intervention at specific localities along cliff line to maintain access to the Island. Relevant Heritage bodies to drive any need for intervention. Actively monitor cliff recession.
37.6	Boscastle	Hold the line	HTL	HTL	HTL	Current shoreline position deemed to be sustainable. HTL policy should not be detrimental to SSSI designations beyond any historical influence of harbour structures.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment						

ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA):

The long-term policy plan for this section of coastline is for NAI across the undefended sections of the

coastline with HTL used selectively at settlements to maintain current standards of defence including Port Isaac and Boscastle.

Various geological and biodiversity sites dependant upon natural processes will benefit from the policy of NAI, however there may be potential impacts to the integrity of heritage features through disturbance or deterioration to the site and it's setting including Tintagel Castle (SM);The Rumps Promontory Fort (SM) and the following Listed Buildings: Garages/Boat Shed; Lacombe and Quay Cottages; Slip and Retaining Wall; Carolina Cellar and Wall; North West Wall to Fish Cellars; Whim Plat; Union Cellars (and White Cottage); and Beach House. Monitoring should be undertaken.

The HTL policy will continue to provide protection to settlements over the next 100 years including the Port Isaac Conservation Area, Boscastle Conservation Area and numerous Listed Buildings, however the same policy will potentially have a impact on the natural geological and biological environment including the Tintagel-Marsland-Clovelly Coast SAC (moderate impacts), Tintagel Cliffs SSSI and Boscastle to Widemouth SSSI and heathland and woodland BAP habitats.

Appropriate Assessment (AA):

HTL is proposed at Port Isaac and Boscastle for all Epochs, whilst at Crackington Haven HTL is proposed in the first Epoch followed by MR in Epochs 2 and 3, and MR is proposed for the first two Epochs at Portquin. All policy locations with the exception of Boscastle and Crackington Haven are located at least 6km from any Natura 2000 Site boundary; therefore no direct or indirect effects are expected. Both Boscastle and Crackington propose HTL along or close to the Tintagel-Marsland-Clovelly Coast SAC boundary, however, given the nature of existing defences and expected proposals and consequences, no direct effects (loss of features) or indirect (hydrodynamic) effects on site features are expected.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics Summary		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages (£k PV)	0.0	1058.5	564.7	1623.2
	Preferred Plan Damages (£k PV)	0.0	0.0	399.3	399.3
	Benefits of preferred plan (£k PV)	0.0	1058.5	165.4	1223.9
	Costs of Implementing plan (£k PV)	262	125	94	481
				Benefit/Cost ratio of preferred plan	2.54

Notes

Initial high investment offsets losses in later epochs, which are erosion dominated