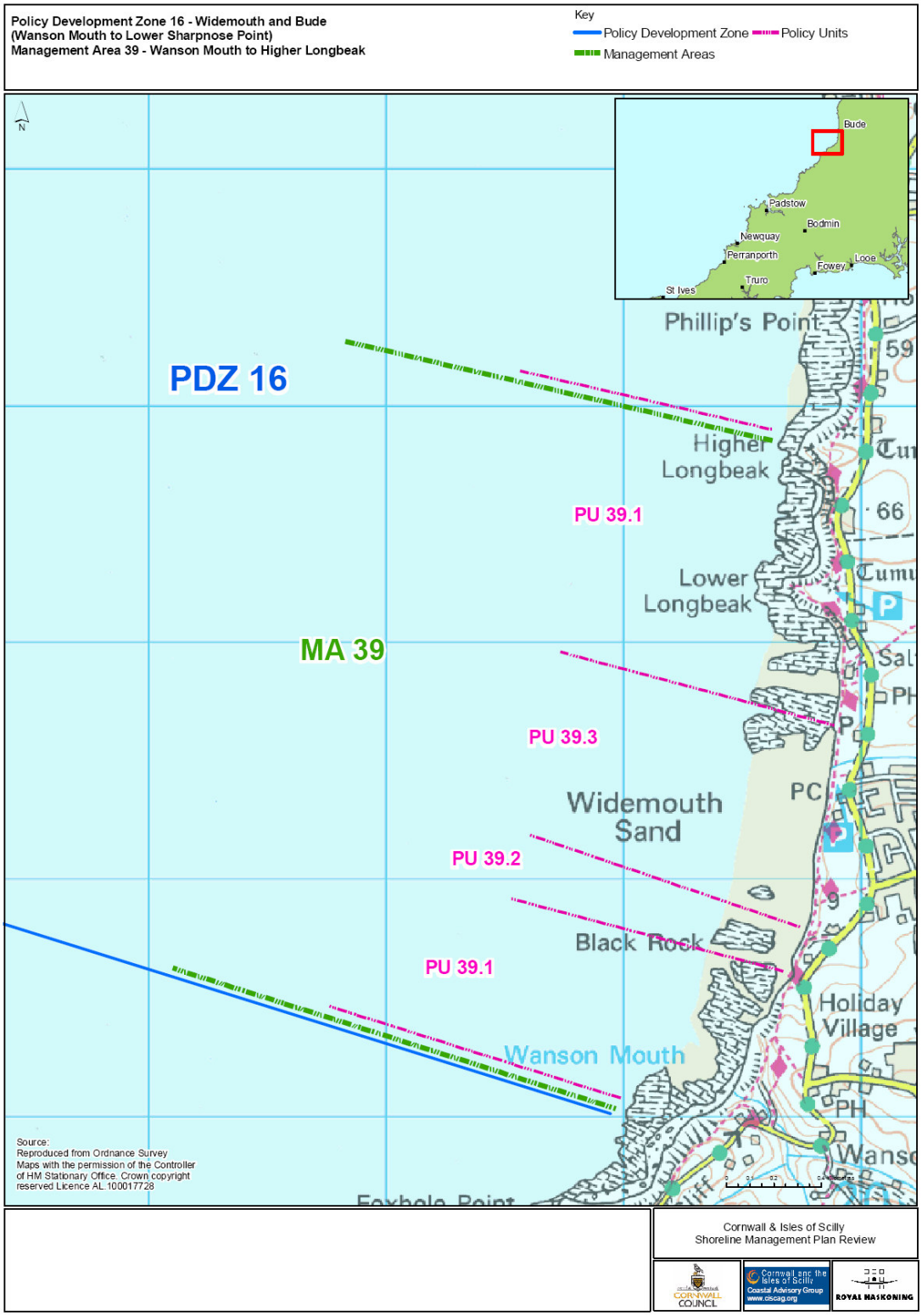
Location reference:	**Wanson Mouth to Higher Longbeak**
Management Area reference:	**MA39**
Policy Development Zone:	PDZ16



DISCUSSION AND DETAILED POLICY DEVELOPMENT

The stretch of coastline between Wanson Mouth and Higher Longbeak is made up of the Sands of Black Rock and Widemouth and the cliffs and shore platforms common to the area. Previous SMP1 policy was to hold the line along the existing defence lengths, and don nothing along the undefended sections.

Widemouth Bay is, in physical coastal terms, an extremely dynamic area, being west facing and therefore exposed to the prevailing conditions, particularly significant wave and wind action. This part of the north Cornish coastline, is very prone to cliff landslides. Cliff recession is evident in the area which in turn relates to observed levels of sand on the beach.

There is currently limited development adjacent to the beach, comprising a car park, café, toilet facilities, and lifeguard station. All development is located behind an armour-stone rock revetment, which was constructed approximately thirty years ago. The revetment is the responsibility of Cornwall Council and as such, any maintenance works required on this structure are their responsibility. The revetment sits above Mean High Water Spring (MHWS) and runs for approximately 400 metres, between the low sandstone and shale cliffs to the south and north of the proposed site. The car park is mainly grass and compacted sand, but has a hard surface road linking the car park with the unclassified minor road, which runs north from Widemouth to Bude.

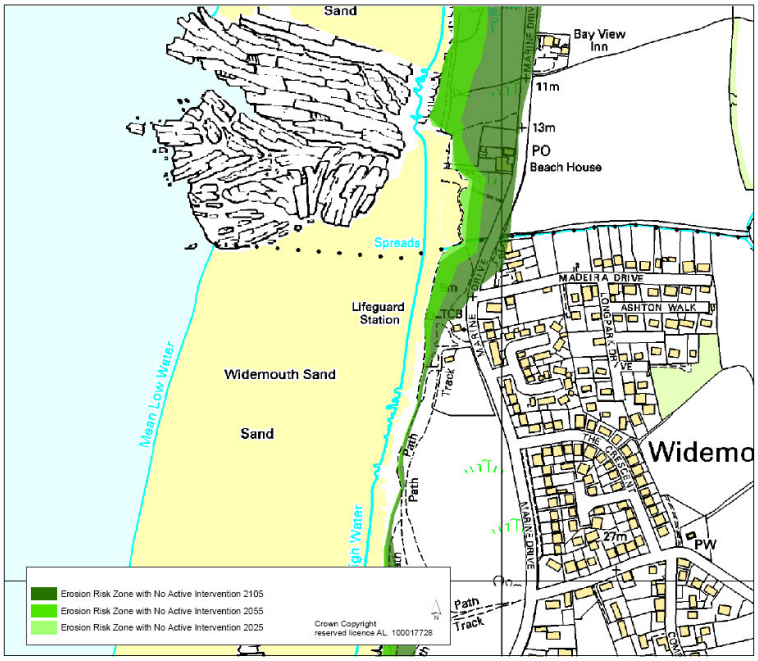
The car park is located approximately 2.5m above the level of the upper beach. There are concrete steps adjacent to the lifeguard station, which allow access from the car park to the beach (see inset photo, right).

Revetment and beach access steps at north Widemouth (RNLI station to left of picture)

There are numerous offshore cables buried below the beach that come ashore at the car park, and only some of these are sign-posted. The presence of these cables limits any development that requires deep excavation.

In general, the top of the beach is constrained horizontally by the revetment. Vertical levels immediately in front of the revetment appear to have increased compared to the SMP profile from 1999. This is countered by levels being lower in the intertidal zone. Cornwall Council comment that beach levels at Widemouth Bay have been known to fluctuate dramatically, and periods of very low beach levels have been observed in the past, to be followed by increased levels. The assessment of erosion risks indicates that under the NAI scenario (i.e. the revetment has failed beyond 2025), there could be between 35 and 70 metres of erosion by 2105 (see inset map below). Given the already

constrained nature of the beach and the lack of any substantial assets protected by the revetment, there is seen to be little justification for continuing to maintain the revetment in its current position. It may be far more sustainable to withdraw maintenance fro the current defensive line and look to undertake managed realignment of the shoreline position. It is possible that the current route of Marine Drive could provide a suitable point to realign to, however monitoring of actual erosion rates once the revetment was no longer effective would be critical in dictating whether realignment to this position would be sustainable beyond 2105.



This part of the coastline, as far as Bude Haven, is very prone to cliff landslides. These landslides take the form of large events, rather than more frequent minor events. The geology of these cliffs consist of layers of sandstone and thin layers of shale. The shale tends to erode at a much faster rate than the sandstone, causing the cliff to be top heavy, resulting in failure. The erosion is believed to be caused mainly by wave action, rather than surface water runoff. Historical cliff recession has occurred to the north of the rock armour revetment as the present day cliff line indicates (inset photo, right). Evidence demonstrated in historical mapping and aerial photography shows there has been approximately 40m retreat of the cliff-line in the last 100 years (Haskoning 2008) along this section between North Widemouth and the headland of Lower Longbeak. This section of the frontage covers around 500m. To demonstrate the rate of cliff retreat along this specific section, anecdotal evidence shows that the coast road to the north of Widemouth Bay ran between the houses (Salthouse Cottage) and the cliff edge in the 1920s.


Eroding cliffs, north Widemouth

Slightly less significant cliff erosion can be seen to the south of rock armour revetment. Up to 20m of recession was experienced between 1907 and 1946 and a further 10m to 2007.

From Lower Longbeak northwards, the cliffs demonstrate a lower general rate of erosion in common with those at Bude, with recession not expected to be more than 5-10m over the next 1oo years, (although individual slips or failures could possibly exceed this).

It should be noted that the RNLI have proposed the construction of a new lifeguard station on the site of the current RNLI structure. The structure itself would have negligible impacts on coastal processes, as it would be located outside of the active coastal processes zone. However the RNLI have been advised that they may need to respond to a change in shoreline management policy that results in abandonment of the defences, as the position of the station is dependent on the presence of the revetment for the stability of its foundations.


Dunes at north Widemouth

The dune system located behind the revetment is in a generally poor condition. 50% of the dune system is reported to be eroding From a visual site inspection it appears that netting is helping to hold sand in place and aid dune stability in certain areas. Natural and uninterrupted functioning of the dunes is an important aspect of the overall health and stability of the northern end of Widemouth Sand and should be encouraged. Cornwall Council currently have sand-dune management polices in place where netting aims to capture and hold sand in place between the rock armour revetment and the northern end of the car park (inset photo, left). This area is particularly vulnerable to damage from visitors gaining access to the beach from the car park.

In 1946, the dunes were heavily vegetated and appeared stable. However as the popularity of the beach increased the car park increased in size along with the extent of vegetated dunes decreasing proportionally. This is seen particularly on the northern section of the parking area, north of the stream outlet. Along with poor management practice, lack of access point control and trampling, the development of the dunes has also been affected where the hard defences front them, as they are cut-off from their natural sand supply.

Historical mapping shows a landward movement of MHWS from 1907 to 2002 of some 10-20m. MLWS displays a greater landward movement of around 40m. The more restricted movement of MHWS is explained by the presence of the rock revetment. This will effectively have constrained the landward movement of MHWS over the last 30 years. Under naturally occurring, non-constrained conditions, MHWS and therefore the shoreline, may be expected to move landward at a similar rate to MLWS. Under the with present management scenario therefore, it is likely that MLWS will continue to advance at a faster rate than MHWS. This will result in a narrowing foreshore and an increase in near-shore water depth, allowing larger waves to approach the defences. Increased coastal squeeze will result from holding the revetment in its current position.

This overall assessment of a narrowing foreshore is supported by Futurecoast's long-term future shoreline change assessment. Futurecoast predicts that there is a landward direction of change and the foreshore is likely to be 'narrowing' if present management practices are maintained. Importantly, this narrowing foreshore indicates that there has been some net loss of sediment from the intertidal area compared to levels 100 years ago, plus a small net increase in mean sea level.

The continued erosion of the cliff material continues to input sediment into the Widemouth Bay system, as demonstrated by the high lithic content of the beach sediment. This is critical in ensuring healthy sediment levels are maintained on Widemouth Sand, although there may be extended periods where the sediment is retained further offshore, particularly in the winter months.

The preferred plan at Widemouth would be to allow natural evolution of the coastline along the entire frontage. This would entail reducing any management effort relating to the revetment and in time removing the structure as necessary to keep the beach safe for users. It may be preferred to undertake a managed realignment which involved dune planting and sand retention techniques to encourage the formation of a more robust dune system landward of the current shoreline. It would be anticipated that in time the dune system would naturally extend itself southwards across the existing car park area. This would decrease pressure along the defended section and would allow a return to natural functioning for the dune system to the north of the car park as it would become reconnected to the beach.

A larger and more naturally functioning dune system would also provide a more robust and dynamic natural defence to the hinterland and area lying behind the car park, including Marine Drive. The inflexible line of defence provided by the revetment will become more expensive to maintain and would constrain the natural response of the upper beach to sea level rise, creating a risk of coastal squeeze.

At Black Rock and the beach car parking area the same thinking would apply - it would also be preferable to allow natural response of the beach to increasing sea level rise and following a period of realignment and re-establishment of the dunes, a no active intervention approach could be adopted (probably during epoch 3).

The wider aspiration for the whole of Widemouth Bay would be re-establishment of one linear dune system stretching around 1km from Black Rock to the cliffs at north Widemouth. This would provide a more natural robust defence to the entire frontage, and the great majority of the development, with only some beachside facilities needing to be relocated. In addition this would have significant environmental benefits and would be likely to improve the habitat value and biodiversity of the coastal strip. In particular, creation of dune habitat would contribute to UK BAP habitat targets for coastal sand dunes. Funding to assist with this management approach would be made more likely through demonstrating that specific Government outcome measures relating to BAP habitats could be achieved. Historic interest in the submerged forest which exists at north Widemouth should be maintained under a policy of managed realignment moving to no active intervention.

It would be anticipated that the undefended cliff sections would continue to erode back at least in line with historical trends/rates and most likely this would accelerate in line

with sea level rise. This would continue to provide important sediment supplies to the frontage. Re-establishing a linear dune frontage would provide an additional sink for some of this sediment, helping to sustain the position of the frontage naturally and providing a buffer zone to future storm damage. Although the economic assessment provides a benefit / cost ratio of 0.21 based on moving to managed realignment, this initial investment is required, if a more sustainable shoreline position is to be achieved. See the Economics Summary Table below and Appendix H for more detail.

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION PLAN:

Location reference:	**Wanson Mouth to Higher Longbeak**
Management Area reference:	**MA39**
Policy Development Zone:	PDZ16

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day (0-20 years)	NAI along undefended cliffs. MR at Black Rock. MR at North Widemouth.
Medium term (20-50 years)	NAI along undefended cliffs. MR at Black Rock. MR at North Widemouth.
Long term (50 -100 years)	NAI along undefended cliffs. Move to NAI at Black Rock. Move to NAI at North Widemouth.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		**SMP1 Policy**	**SMP2 Policy Plan**			
		50 yrs	**2025**	**2055**	**2105**	**Comment**
39.1	Undefended cliffs	Do nothing - to maintain geological exposures and coastal habitats.	NAI	NAI	NAI	Continue to provide important sediment source to frontage.
39.2	Black Rock / south Widemouth	Hold existing defence line along defended frontage. Do nothing for remaining lengths.	**MR**	**MR**	**NAI**	Realignment efforts to re-establish naturally functioning dune system – provide improved natural defence and buffer zone, improve habitat status. Roll-back may require support from land use planning system.
39.3	North Widemouth	Hold existing defence line along defended frontage. Do nothing for remaining lengths. Do nothing but monitor at Salthouse.	**MR**	**MR**	**NAI**	Realignment efforts to re-establish naturally functioning dune system – provide improved natural defence and buffer zone, improve habitat status. Roll-back may require support from land use planning system.

Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention
MR – Managed Realignment

ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA):

Various geological and biodiversity sites dependant upon natural processes will benefit from the long-term policy of NAI along this stretch of coastline including Upton Coast RIG site, Cornwall AONB and heritage coast. The policy of realignment efforts for epoch 1 and 2 to re-establish naturally functioning dune system will provide improved natural defence and buffer zone, improve habitat status and will continue to manage risks to life and property and support community adaptation at Black Rock / south Widemouth and North Widemouth.

Habitat Regulations Assessment (HRA):

HTL is proposed at Bude Haven and Canal, whilst MR is proposed for Epochs 1 and 2 at Black Rock / south Widemouth, North Widemouth, Summerleaze beach, and Crooklets Beach. These policies occur close to (within 10m) or some distance (up to 300m) from the Site boundary, however, no direct loss or disturbance is expected on Site features, and due to the localised nature of hydrodynamic effects

coupled with the MR policies moving away from the Site boundary, no indirect 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	0.0	15.3	15.3
	Preferred Plan Damages (£k PV)	0.0	0.0	0.0	0.0
	Benefits of preferred plan (£k PV)	0.0	0.0	15.3	15.3
	Costs of Implementing plan £k PV	73	0	0	73
				Benefit/Cost ratio of preferred plan	0.21

Notes

Below unity B/C ratio due to limited benefits of moving to MR - initial investment is required to allow more sustainable defence. NB maintaining defence would most likely show a far lower B/C ratio.