

PDZ3. ST DAVID'S TO STRUMBLE HEAD :

Solva

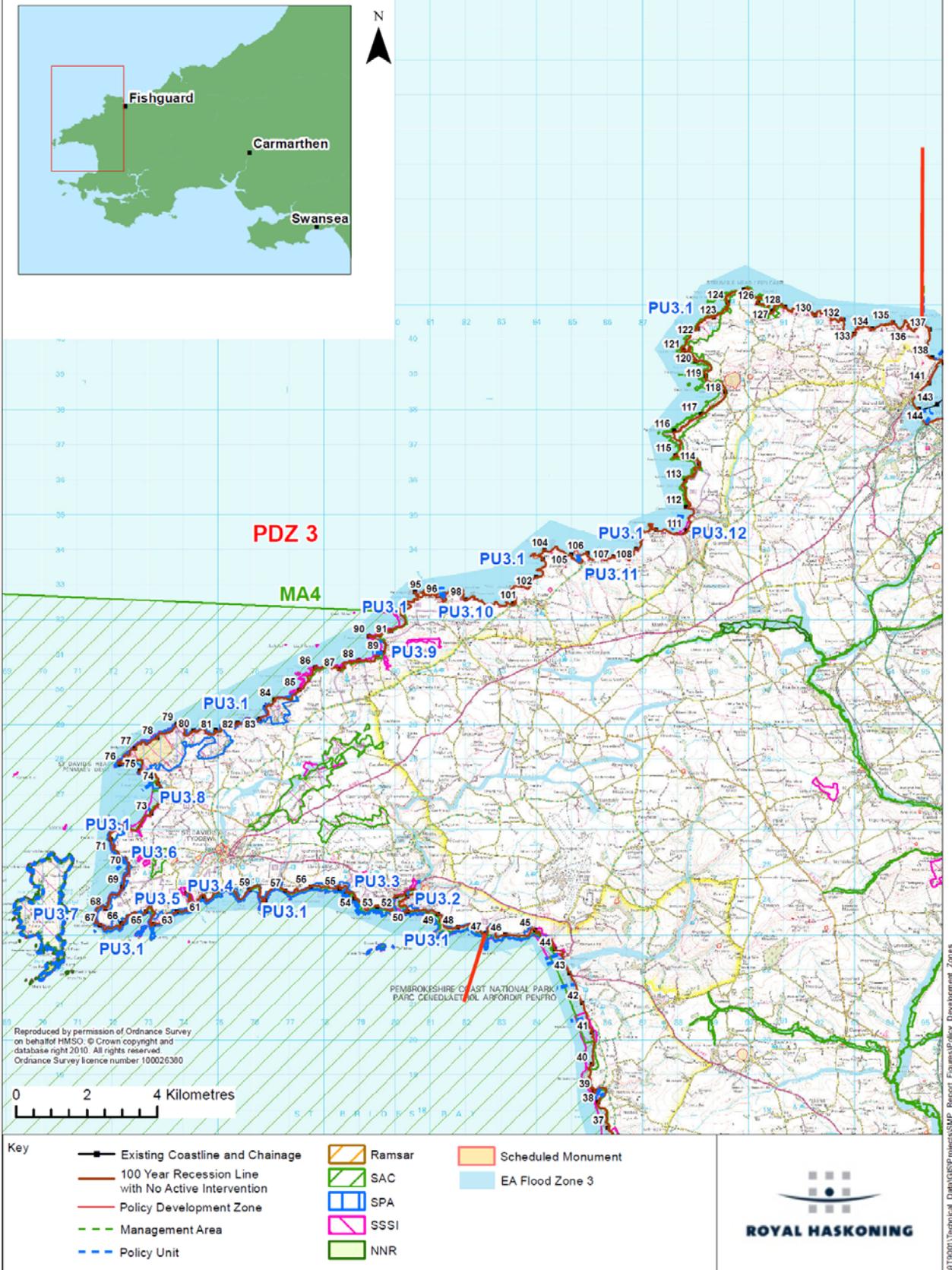


Dinas Fach to Pen Anglas, including Ramsey Island

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**Shoreline Management Plan Sub Cell 8 & 9
Baseline Location Map
Policy Development Zone 3 - St David's to Strumble Head**



1 Local Description

The Zone, extending from the northern flank of St Brides Bay, effectively through to Fishguard Harbour at Pen Anglas, substantially comprises hard rock cliffs and headlands, interspersed with many small bays and inlets. Only at St David's Head is there the slightly larger Whitesands Bay. St David's is the main settlement of the area and also the major tourism focus. The main road to St David's (as discussed in PDZ2) runs well towards the back of the cliffs of the northern section of St Brides Bay. This road runs through the lower village of Solva at the head of the inlet of Solva Harbour.¹ The other main road to St David's comes from the northwest and Fishguard. This road runs some 3km in land from the northern coast, to this Zone.

Roads tend to radiate out from St David's to the various coastal communities and there is no particular coast road. Over the northern section of the area, roads to the various coastal communities run out towards the coast from the main road. Again there is no road linking communities along the coastline.

The only major village on the coast is Solva, and this is set back at the head of Solva Harbour. The other villages are all more local hamlets, each having a slightly different character, but each important for specific values which they contribute to the overall region. All are, however, separated physically from each other which means there is little interaction in terms of shoreline management.

The St Brides Bay cliff line, extending around almost to Abereiddy, is designated SPA and over a slightly broader extent, including the western side of Strumble Head, is designated SAC. These designations also extend to Ramsey Island which is included within this Policy Development Zone. There are several prehistoric hill forts along the cliff line; at Solva, Porth-y-Rhaw and Caerfai on the southern side of the Zone; and at Castell Heinif, St David's Head, Castell Coch, Caerau, Ynys y Castell, Penmorfa, Dinas Mawr, with Strumble and St David's Headlands being designated historic landscape areas.

The Zone can be seen, therefore, very much as two distinct layers. These are, firstly, the more general, highly important natural coast. This offers a natural and changing aspect to a nationally important historic resource, which makes up part of the fundamental character of Pembrokeshire. Secondly, at the local scale, there are the individual small communities with quite specific issues and values.

For this reason, the format of the SMP document changes slightly; firstly discussing the general coast, before zooming in to appropriate level of detail for each local area. The same overall format is adopted, however, so that for each local area a description is given, the baseline scenarios are considered and assessed, but then policy is also discussed. The conclusions for the whole area are pulled together at the end of this process.

¹ The road also runs behind the shingle ridge at Newgale and on to Haverfordwest At Newgale the road is likely to be lost, potentially over the second Epoch.

Coastal Processes for the General Coastal Area

The southern section of the coast is exposed to the dominant southwesterly waves. This persists over St David's Head although here there is significant shelter from Ramsey Island. Along the northern coast, although the main wave energy arrives from the southwest, waves are diffracted so that they approach the coast from a more westerly direction. This northerly section of the coast has greater exposure to waves directly from the north and northwest. There is little or no interaction between different sections of the shoreline, although within local bays there can be significant movement of sediment in response to different wave directions. Typically, where bays are sufficiently deeply indented within their rock headlands, they have storm shingle beaches with some sand over the intertidal foreshore.

The main process at the general scale is for very slow erosion of the hard rock, with the potential for more rapid erosion of softer deposits within the bays.

POTENTIAL BASELINE EROSION RATES

A distinction is made between basic erosion of the shoreline and cliff recession, affecting the crest of cliffs and coastal slopes. This is noted in the table below together with other relevant factors. In assessing erosion and recession in the future allowance has been made for Sea Level Rise and this is discussed in Appendix C. This is also discussed briefly following the table.

Within local bays, Sea Level Rise (SLR) will be a significant factor in future development of the shoreline. Where there are softer cliffs or shorelines, suffering erosion, the rate of erosion is likely to increase with SLR. This might be by a factor of 1.7 to 2.5 times the existing base erosion rate, over the 100 years. Where there are more stable features, such as fully developed storm beaches there would be a natural roll back of the beach, potentially in the order of 10m to 40m, depending of the nature of beach and the coast behind. As beaches, protecting at present relatively stable coastal slopes, erode or roll back, this could result in the re-activation of landslides and slope instability

Location	NAI Base Rate (m/yr)	Notes	100yr. Erosion range (m)
Hard cliffs generally.	0.05	Slow erosion and occasional rock falls.	5 - 10
Whitesands Bay	0.1	General roll back of shoreline	6 - 30
Abereiddy	0.3	Adjustment following loss of defences	30 - 50
Abercastle	0.05	Roll back of beach	10 -30
Aber Mawr	0.1 - 0.2	General erosion	10 - 50
Locally to cliffs	0.2 - 0.3	Erosion and landslip	10 - 60

Base rates have been assessed from monitoring and historical data. The range of potential erosion is assessed in terms of variation from the base rate and sensitivity in potential Sea Level Rise. Further detail on erosion rates, together with erosion maps are provided in Appendix C.

FLOODING

The most significant area of flood risk is at Solva. In other areas potential flooding is discussed at the local level.

EXISTING DEFENCES

The defences within individual bays are described in the following pages. The general coast is undefended.

UNCONSTRAINED SCENARIO

The unconstrained scenario is for continued erosion of the general coastline. This is developed further for each local area.

KEY INTERACTION WITH DEFENCES

This is considered within each local area.

3 Management scenarios for the General Coastal Area

Over the general coast there are no defences and as such the two baseline scenarios are the same. The main impact would be on the historic environment. Given the slow rate of erosion generally, and the significant cost and severe impact this would have on the important naturalness of the coast, a change in policy would neither be justified nor acceptable. Where there is scope for management at the local level to sustain features of the historic environment, then this will be considered. The overarching policy for the Zone is for No Active Intervention over the three Epochs. Within this context the local areas are now considered.

SMP 1 policy is set out in the table below for those areas considered in detail.

SMP 1			Subsequent Management Approach
No.	Unit	Policy	
North Pembrokeshire. (Note policy was developed for short term and long term over the 50 year period.)			
18SOL/A	Solva	HLT/HTL	
18PCL/A	Porth Clais	SHTL/SHTL	
19WSB/A	Whitesands Bay	SHTL/R	
20AEY/A	Abereiddi	HTL/R	Current discussion on potential realignment
20PGN/A	PorthGain	HTL/HTL	
20ACS/A	Abercastle	DN/HTL	
20MTY/B	Aber Mawr to Aber Bach	DN/DN	

In addition, the following information and policy is abstracted from the Pembrokeshire and Ceredigion Rivers CFMP Draft Plan.

Policy Unit 4 Western Coastal Rivers	The Western Coastal Rivers Policy Unit comprises many short steep watercourses, which respond quickly to rainfall and drain the coast of Pembrokeshire from Tenby, in a westerly direction to Fishguard.
Problem / risk:	<p>Problem:</p> <p>The main source of flooding is fluvial flooding and tidally influenced fluvial flooding. River channels quickly fill and flow out of bank across the floodplain. Onset is rapid and duration is likely to be short. Tidally influenced fluvial flooding is a problem in the lower river reaches especially when high tides and strong winds combine with high river levels. Localised surface water flooding is also a problem.</p> <p>Current Flood Risk:</p> <ul style="list-style-type: none"> - The majority of people affected by flooding live in Fishguard, Solva and Tenby. Solva and Tenby have particularly vulnerable communities. - Narrow and confined river valley causes deep fast-flowing floodwater in Fishguard and Solva. - A total of 1.2km of raised defences across the policy unit protects

	<p>approximately 60 properties from a 10% AEP event, mainly in Fishguard and Solva.</p> <p>Future Flood Risk:</p> <ul style="list-style-type: none"> - Broadscale modelling shows that climate change is likely to increase the number of properties at risk of flooding from approximately 200 to 310 properties; this is an increase of 55% from the current number of properties at risk from the 1% AEP flood event. - Landuse change and urbanisation is not expected to have a significant impact in this policy unit. - Approximately 1% of the total population of the Policy Unit are at risk from a 1% AEP flood event. This is a 42% increase from the current number of people at risk from the 1% AEP flood event. - Greater floodwater depth and velocity will increase the level of hazard for people living in areas prone to flooding. - Flood damages are expected to increase by approximately 83% for the 1% AEP flood event. - It is likely that flood depths will increase in the future, with typical depths of flooding during a 1% AEP flood event increasing by nearly 1m as a result of Sea Level Rise in Fishguard and Tenby. - The speed of onset of flooding will increase slightly in the more upland catchments of the Western Coastal Rivers.
<p>Policy selected</p>	<p>Policy 4 – Take further action to sustain the current level of flood risk into the future.</p>
<p>Justification and alternative policies considered</p>	<p>Policy 4 – There are a number of smaller settlements at risk of flooding dispersed throughout the Policy Unit. When combined, however, these dispersed settlements amount to relatively large numbers of properties at risk from flooding. Due to the level of risk anticipated in the future, a policy option 4 would deliver the objectives in maintaining the current level of flood risk in the future in line with climate change. Under a policy 4, flood warning and flood resilience measures will continue to improve now and in the future. A policy 4 would allow flood risk management actions to be focused in areas of greatest risk, such as Fishguard. Sustaining the current level of flood risk in the future under a policy 4 would result in annual average damages remaining at approximately £0.18m.</p> <p>We have selected this policy based on the risk posed by inland flooding sources and tidal flooding sources. If the risks posed by tidal flooding were removed from the policy appraisal process, preliminary estimates suggest that this policy would change from a Policy 4 to a Policy 3.</p> <p>Alternative policy options considered:</p> <p>Policy 3 – A policy option 3 would result in an increase in flood frequency and depth in the future. The residents and businesses of Fishguard, Solva and Tenby would be affected by an increase in disruption to infrastructure, social stress and economic loss.</p> <p>Policy 5 – Measures have already been put in place to reduce the risk of flooding at Solva and are proposed for Merrion and Stepside. Due to economic, social and environmental reasons, it is unlikely that further flood alleviation options could be implemented to reduce the level of flood risk.</p> <p>Policy 6 – There is already a purpose-built flood alleviation/storage scheme at Pont y Cerbyd, which has been specifically built to reduce the extent of flooding in the town of Solva. For the other watercourses, due to the small size of their catchment area and short length, there is a limit</p>

	to the physical area available for flood storage.
Catchment-wide opportunities & constraints	<p>Opportunities: To reduce flood risk to Fishguard and Solva through improved flood warning and emergency response. Unlike raised defences, flood warning and emergency response actions allow the connection between the river and floodplain to be maintained.</p> <p>Constraints: Steep, short coastal catchments with potential for rapid response to flooding such as the Nevern, Solva, Gwaun and Brandy Brook in the Western Coastal Rivers Policy Unit, are difficult to manage. We must recognise that there are few options available which will change the frequency or extent of flooding and there is limited opportunity to improve flood warning in steep, short coastal catchments which have a rapid response to rainfall. Our approach to managing flood risk must focus on reducing the impact.</p> <p>Dispersed, smaller settlements with limited scope or justification for individual defences such as Solva. When combined, however, these dispersed settlements amount to relatively large numbers of properties at risk from flooding. This makes it difficult to apply cost-effective flood risk management actions.</p>

3.1

Solva

LOCAL DESCRIPTION

The village of Solva is located at the head of and, principally, along the northern side of a steeply cut tidal inlet. The Solva stream runs down through a bridge under the main A487 and is canalised through the lower part of the village.

The main road heads to Upper Solva at the crest of the steep northern side of the main valley. The inlet is oriented northeast/southwest and at its mouth it curves sharply to the south to cut through to the coast. On the northern side of the inlet, where the inlet changes direction, is an important quay and sailing centre. The lower village, at the head of the inlet, comprises a significant number of properties and businesses to either side of the river. There is also a boat park, slipway and car park. On the southern bank of the inlet there are a collection of Lime Kilns which are both listed buildings and designated as SAM. There are other listed buildings within Lower Solva and the bridge is a listed structure. The village is an important tourist destination.



EXISTING DEFENCES

The river is canalised through Lower Solva. There is a pitched stone revetment around the car park and this continues below a walkway along the northern side of the valley through to the sailing quays. The quays form a defence to property and to the toe of the coastal slope to Upper Solva.

UNCONSTRAINED SCENARIO

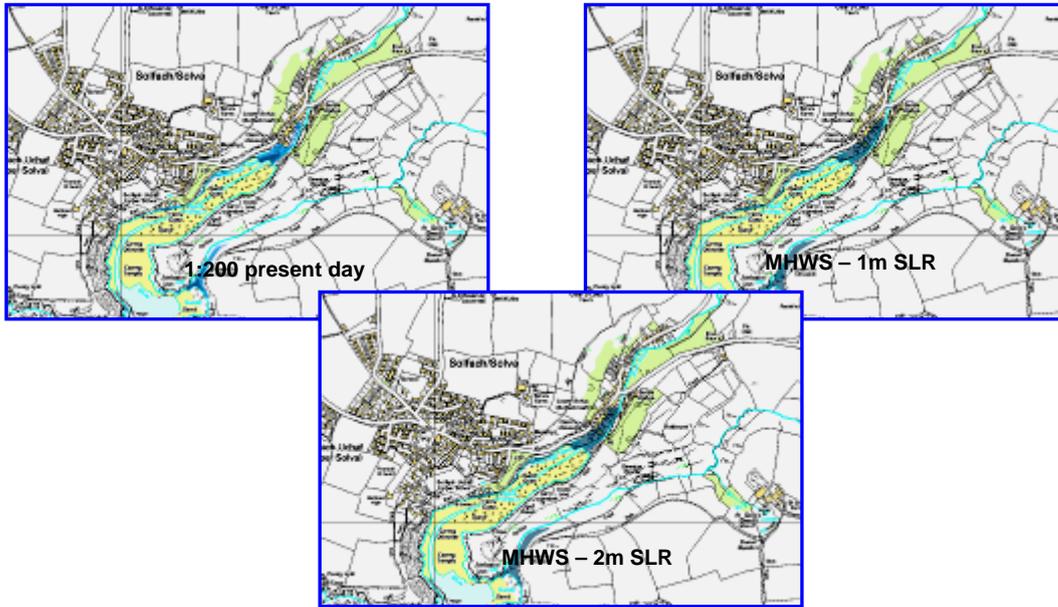
In the absence of defences there would be general slow recession of the cliffs to the northern side of the valley. The land on which the lower village is situated is level with the reveted canalisation of the river channel. Without this canalisation there would be a general movement of the water course, causing erosion of its banks.

COASTAL PROCESSES

The bed of the harbour is covered with sand and there are small sand banks, suggesting that the inlet can accumulate sediment from the offshore area. The inlet is well protected by the orientation of the mouth in relation to its extension in land. Only limited waves can enter the harbour and these are significantly reduced by the time they progress towards the lower village.

FLOODING

The main threat to the lower village is flooding.



The plots above show that at present there is a risk of flooding to some properties in the lower village under more extreme events. In the future, either with the 1m Sea Level Rise Scenario or the 2m SLR Scenario, the risk increases substantially.

4 Management scenarios

Solva



No ACTIVE INTERVENTION – BASELINE SCENARIO 1.

Under this scenario the existing defences would be allowed to fail. Given the relatively low wave exposure of the lower village area, these defences would only gradually fall into disrepair. Failure is most likely to result from undermining of the toe. This, in itself, would not increase flood risk as the level of the land is at the crest of the defences. Along the northern shoreline the gradual failure of defence is likely to increase the risk of slope instability and this could impact on the main road. The quay area comprises relatively heavy concrete defences; the gradual undermining and wave action might result in their failure in some 30 years time. This would impact severely on the use of the area and may result in increased slope instability affecting properties in Upper Solva. The main risk

would be from increased flooding due to Sea Level Rise, if defences were not raised accordingly. This would, over the 100 years, affect a significant area of Lower Solva but would not necessarily affect the road, even under the 2m SLR Scenario. The table below indicates that some 11 properties would be at significantly greater risk from flooding. The Lime kilns to the south of the inlet are already occasionally flooded. This flood would increase substantially under this scenario, or under the WPM scenario described below.

4.1 With Present Management – Baseline Scenario 2.

The existing policy is for Hold The Line and the CFMP suggests sustaining defence in line with climate change. Further upstream the defence attempts to reduce the spate flow in the

river. Under this scenario defences at the quay would be sustained as would the walkway along the northern flank of the valley. This would maintain protection to the coastal slope as well as maintaining the sailing interest. There would be an issue in relation to the level of defences and maintaining access to the water for boat use. In the area of Lower Solva it would be this need to raise defences along the whole river channel that presents a problem. Over the next fifty years defences would need to be some 0.5m higher to maintain the same standard of protection as at present. In 100 years these defences would need to be raised typically by 1m and, depending on the rate of Sea Level Rise could need raising to 2m. This would put property at risk from sudden failure and would severely constrain the flow of the river. Such a trend in response to Sea Level Rise is considered unsustainable, both in terms of future expectation and in terms of the impact on the character of the village.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

It is considered possible to maintain both the area of the quay and the integrity of the walkway. Funding may be an important issue, however, and collaborative funding would need to be sought to maintain current use of the area. Such joint funding has already been accepted in the development of recent schemes.

Whilst it may be practical to raise defences to Lower Solva over the first two Epochs, continuing this policy into the future is not considered sustainable. The narrowness of the river channel, if substantially defended would create problems for catastrophic flooding should defences fail. It would also destroy the important landscape of the village. Over the next 50 years planning should be put in place to make properties more resilient to flooding, with the possibility of actually removing property from within the flood plain. This would need to be developed with the local community. The policy for Lower Solva would be Hold The Line initially but with the intent for Managed Realignment in the future.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS

Table 1. Economic Assessment

The following tables provide a brief summary of erosion and flood damages, determined by the SMP2 MDSF analysis for the individual area. Further details are provided in Appendix H. Where further, more detailed information is provided by studies, this is highlighted. The table aims to provide an initial high level assessment of potential damages occurring under the two baseline scenarios.

ASSESSMENT OF EROSION DAMAGES

Epoch	0 -20 year			20 – 50 years			50 – 100 years			50 – 100 years (2m SLR)		PV Damages (£x1000)
	No. of properties:		Value x £k	No. of properties:		Value x £k	No. of properties:		Value x £k	No. of properties		
Location	Res.	Com.		Res.	Com.		Res.	Com.		Res.	Com.	Res.
NAI							1	2	178	1	2	36
WPM							1	1	172	1	1	35

Notes: PVD determined for 1m SLR in 100 yrs.

Other information:

ASSESSMENT OF POTENTIAL FLOOD RISK

Location	Flood risk tidal 2010			Flood risk tidal 2060			Flood risk tidal 2110			tidal risk 2m SLR		PVD (£x1000)
	No. of properties		AAD x £k	No. of properties		AAD x £k	No. of properties		AAD x £k	No. of properties		
Solva	<1:10	>1:10		<1:10	>1:10		<1:10	>1:10		<1:10	>1:10	<1:10
NAI	0	7	3.75	5	3	9.09	10	1	170	14	1	678
WPM	0	7	3.75	0	8	2.93	0	11	32.9	0	15	196

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
Reduce risk to life.	Red	Orange	Green	Red	Orange	Green
Protect properties from flood and erosion loss.	Red			Red	Orange	
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.	Red			Red		
Maintain access to the coast including car parking and facilities.	Red			Red		
Maintain access for boat use and associated diving activity.	Red					Green
Maintain character and integrity of coastal communities.	Red					
Identify risk and reduce risk of loss of heritage features where possible.		Orange			Orange	
Maintain historic landscape.	Red				Orange	
Prevent disturbance or deterioration to historic sites and their setting.	Red			Red		
Maintain or enhance the condition or integrity of the international (SAC, SPA) designated sites and interest features within the context of a dynamic coastal system.			Green		Orange	
Maintain or enhance the condition or integrity of the national (SSSI) designated sites and interest features within the context of a dynamic coastal system.			Green		Orange	
Avoid damage to and enhance the natural landscape.			Green	Red		
Maintain the human landscape and character of communities.	Red			Red		

4.2 Porth Clais

DESCRIPTION

Porth Clais is a small inlet facing out on the northern cliff line of St Brides Bay. The inlet is only 400 m in length and of the order of 50m wide, running almost as a gorge in land to the local road. The area has an important historical context as a small industrial port and there are several Lime Kilns with quays to either side of the main channel, at its upper end. There is a small quay at the mouth of the inlet and this provides essential protection to an area of moorings. Access along the inlet is restricted over the tide, although there is access via the coastal path and private access from Pen Porth Clais. The whole tidal inlet is designated SSSI and the outer part of the inlet is SPA and SAC.



Porth Clais

UNCONSTRAINED SCENARIO

In the absence of defences the main consequence would be exposure of the mouth of the inlet and significant wave action further up the valley. It is unlikely that there would be substantially greater wave action at the road.

EXISTING DEFENCES

The main defence is the large quay structure at the entrance. This structure is subject to high wave energy and is considered to be in moderate condition, with potentially a residual life of some 30 years. There are other local defences along the sides of the inlet in the form of small quays and slipways.



Porth Clais

The main area of defence is at the road and to either side of the inlet in front of the Lime Kilns.

COASTAL PROCESSES

The bed of the inlet comprises area of mud and sand, but there is little active movement of material. Increased wave climate would change the entrance in areas from mud to a higher energy environment with the probable introduction of more sand.

There is a flood risk to the road with Sea Level Rise although the road is at about 6m OD.

MANAGEMENT SCENARIOS

No Active Intervention – Baseline Scenario 1.

Under this scenario the outer quay would fail and there would be substantially greater wave energy penetrating the inlet. This is likely to result in the current moorings being abandoned. At the head of the inlet, the quays would fall into disrepair and the Lime Kilns and the historic character of the old harbour would be lost. There would need to be further recording of the historic environment. The road would be subject to more regular flooding and under a 1m Sea Level Rise Scenario flooding would occur on regular basis. Under a 2m SLR Scenario

the road might locally flood every Spring Tide. There would be no loss of residential property due to erosion or flooding.

WITH PRESENT MANAGEMENT – BASELINE SCENARIO 2.

The existing policy for selectively holding the line. This relates specifically to the upper parts of the inlet. This approach would be feasible, even if the outer quay were lost.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The existing policy appears both sustainable and in keeping with the intent to maintain the important historic aspects of the location. Rather than a policy of selectively holding the line, SMP2 sets a more specific intent. The aim would be to support future efforts to maintain the outer quay and the use of the inlet for boating. It is improbable, however, that this would be funded through coast protection and it would need to be funded privately. As such the policy would be for No Active Intervention over the outer inlet. This would specifically not preclude works to sustain the quay although it is considered that this would become increasingly difficult with Sea Level Rise. Any works would need to be assessed under normal procedures, taking account of the possible impact on nature conservation designations.

At the road, and including the quays, the policy and intent would be to maintain the existing defences, principally to support the historic environment. Collaborative funding would have to be considered and might in part come from the Highway Authority.

As sea level rises so navigation to the upper part of the inlet would increase. This may provide opportunity for relocation of the current moorings and the potential for further funding opportunities.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

There is no loss to property from either flooding or erosion in this area. There would be loss of the Lime Kilns due to erosion.

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
	Red	Orange	Green	Red	Orange	Green
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.		Orange			Orange	
Maintain access to the coast including car parking and facilities.	Red					Green
Maintain access for boat use and associated diving activity.	Red			Red		
Identify risk and reduce risk of loss of heritage features where possible.	Red					Green
Maintain historic landscape.	Red					Green
Prevent disturbance or deterioration to historic sites and their setting.	Red					Green
Maintain or enhance the condition or integrity of the international (SAC, SPA) designated sites and interest features within the context of a dynamic coastal system.		Orange			Orange	
Maintain or enhance the condition or integrity of the national (SSSI) designated sites and interest features within the context of a dynamic coastal system.		Orange			Orange	
Avoid damage to and enhance the natural landscape.			Green			Green
Maintain the human landscape and character of communities.		Orange			Orange	

4.3 St Justinian's and Ramsey Island

DESCRIPTION

Ramsey Island is both geologically and biologically important and is designated within the SPA and SAC. Its geological significance comes from the large volcanic exposures and its exposure of basal Arenig unconformity. In addition to its internationally important bird and wildlife, the island also has important sea cliff vegetation and has a diverse and numerous range of rare plant life. At the shoreline there are also scarce aquatic plant communities. There are some existing buildings on the island but these are not considered at risk from erosion. Much of the island is rock cliff with a small sandy bay on the western side. Access to the island is by ferry from St Justinian's, on the mainland. There is a small landing stage on the island opposite. The landing stage at St Justinian's is within a small bay backed by high cliffs.

The ferry landing stage shares the location with the RNLI Lifeboat Station and there is a small building set back to the toe of the cliff. Access to the Lifeboat Station and landing are down the cliff face. There are proposals for a new RNLI Station to the south of the existing building.



EXISTING DEFENCES

The defences are solely those associated with the RNLI station and landing stage and comprise a rear masonry wall. On the island the landing stage has a small jetty and slipway.

UNCONSTRAINED SCENARIO

Erosion of the cliffs of in both areas is low and is in effect unaffected by the local defences.

COASTAL PROCESSES

The only significant processes are of slow erosion of the cliffs and the beach area of the island.

MANAGEMENT SCENARIOS

No Active Intervention – Baseline Scenario 1.

If no action were taken to maintain the landing stages and RNLI station there would be loss of access to the island and risk to life, with detriment to water use of the area in general.

With Present Management – Baseline Scenario 2.

Current management looks to maintain the landing stages and RNLI station. The main impact of Sea Level Rise would be greater exposure and difficulty maintaining the services.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The logical intent is to maintain both the important landing stage and support the continued use of the RNLI Station. It is not envisaged that this would significantly impact on the natural coast. There will be issues in terms of use with Sea Level Rise and this will need to be addressed. The policy for St Justinian's and the island is for No Active Intervention but specifically this would not preclude works to maintain the ferry service and the RNLI station.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

Apart from the loss of service there is no loss of property or risk from flooding.

4.4 Whitesands Bay

DESCRIPTION

Whitesands Bay is on the western end of the St David's peninsula, just to the south of St David's Head. The width of the bay is, in total, of the order of 1.5km, two thirds of this being backed by a narrow sand beach and hard rock cliff. About 500m is softer clays formed in the valley of a small stream over the northern section of the bay. Over this section the coast is set back slightly, allowing the development of a wider and higher area of sand beach backed by shingle. The bay is an important recreational area with local watersports, a rescue centre, and car park. The car park is large and capable of taking coaches, which reflects the significance of the site for tourism. To the north of the car park is the remains of St Patrick's Chapel which is a designated SAM. There are a few isolated properties to the south of the main recreational area set back to the crest of cliff. The bay is designated SSSI and part of the SPA and SAC. The bay is an important feature of the coastal path.



UNCONSTRAINED SCENARIO

In the absence of defences the shoreline over the area of the valley would have eroded back together with the clay cliff further to the north.

EXISTING DEFENCES

The car park is defended by a low masonry wall set to the back of a small shingle bank and revetment. In front of the rescue centre there is a more substantial pitched rock revetment. Although both main areas of defence are only in moderate condition they are not at present seen as being under significant pressure. The beach in front of the defences is relatively high.

COASTAL PROCESSES

The hard rock headlands of Point St John and St David's Head act to contain the bay, and provide a significant degree of shelter to the area. The wave climate is limited directionally and the main process is one of roll back of the lower central shoreline and more aggressive erosion of the clay cliffs. It is suggested that there has been erosion of both the MHW and MLW marks in the order of 1m/yr and 3.7m/yr based on historical maps. This seems high in relation to the observed lack of pressure on the defences. However, erosion will increase with Sea Level Rise as the whole profile of the bay attempts to roll back. There is at present no monitoring of the frontage but it would be assumed that there is a general pattern of onshore offshore movement of the sand within the bay. There is no record of significant longshore drift. The defence at the car park does, however, act to hold slightly higher beach levels to the north in front of the site of St Patrick's Chapel.



While there is a risk of flooding to the car park, there are no properties at risk.

MANAGEMENT SCENARIOS

No ACTIVE INTERVENTION – BASELINE SCENARIO 1.

Under this scenario the defences would be allowed to fail, which they would largely do as a response to Sea Level Rise and the attempt of the whole shoreline profile to move in land. There would be loss of the rescue centre and parts of the car park. There would also be further erosion of the clay cliffs and further loss of the area of St Patrick's Chapel. There is no suggestion that properties along the crest of the cliff would suffer loss due to the hard nature of the toe to the coastal slope. However, this would need local investigation with respect to local slope instability.

WITH PRESENT MANAGEMENT – BASELINE SCENARIO 2.

The existing policy is for selectively holding the line in front of the car park and rescue centre. The potential need for retreat was identified in SMP1 over the longer term. Holding the line would become significantly more difficult with Sea Level Rise. Normal Spring Tides would reach the level of the car park under a 2m Sea Level Rise Scenario.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

At present there is no significant pressure for change and maintaining the defences would sustain the important use of the area. In the future and closely associated with the pressures of Sea Level Rise, maintaining the defences in their current form and position would be difficult and would start to have a serious impact on the very natural attractiveness of the area which is so important to its use.

The intent for the area is to achieve a better balance which would lend itself to allowing and managing the retreat of the shoreline. There would be no specific line defined for future defence, and as such, although the policy intent would be Managed Realignment, the aim would be one of progressive retreat and adaptation of use of the area. This might typically involve re-use of the existing rock in the form of groynes or low backshore/ cross shore structures, helping to retain natural beach and shingle. This would need to be considered in conjunction with a gradual retreat of the car park area, using the existing defence material to maintain access points and contribute to the natural function of the shoreline. In this way it may be possible to encourage dune growth as the shoreline retreats as well as maintaining both important recreational and tourism function of the area. The opportunity under this plan would also be to retain some degree of protection to the SAM at the northern end of the beach. This could allow additional time for further records to be made of the historic feature.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

There is no loss to property from either flooding or erosion in this area. There would be loss of St Patrick's Chapel under either scenario.

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
	Red	Orange	Green	Red	Orange	Green
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.			Green	Red		
Maintain access to the coast including car parking and facilities.	Red					Green
Maintain access for boat use and associated diving activity.	Red				Orange	
Identify risk and reduce risk of loss of heritage features where possible.	Red				Orange	
Maintain historic landscape.		Orange			Orange	
Prevent disturbance or deterioration to historic sites and their setting.	Red			Red		
Maintain or enhance the condition or integrity of the international (SAC, SPA) designated sites and interest features within the context of a dynamic coastal system.			Green		Orange	
Maintain or enhance the condition or integrity of the national (SSSI) designated sites and interest features within the context of a dynamic coastal system.			Green		Orange	
Avoid damage to and enhance the natural landscape.			Green	Red		
Maintain the human landscape and character of communities.		Orange		Red		

DESCRIPTION

Abereiddi is a small westerly facing bay to the north of St David's Head. The beach is situated within a steep sided and infilled glacial outwash valley. The beach is composed of hard igneous gravel and rests on a gently sloping lower beach of fine material. Several cottages are situated behind the southern section of the car park, on slightly raised ground. Several of the buildings are listed. The bay is formed by the erosion of softer rock within the central section of the bay, with harder igneous rocks forming the headlands to

north and south. The northern headland is the site of a slate quarry. Much of the former activity within the bay was associated with this industry. The quarry was closed in 1904 and then flooded, forming the Blue Lagoon. The car park and beach area is an important recreational and tourism feature and the historical context of earlier industrial use is equally important. The area is owned by the National Trust. The only access to the bay is via the road along the crest of the cliffs to the south.

EXISTING DEFENCES

The frontage is protected by an old timber sleeper wall retaining the area of the car park. Over much of its length this wall, built in the 1970s, is in poor condition and has been reinforced from behind, by larger rocks, to prevent outwash of material. The findings of a



recent study suggest that the beach area and certainly the car park is not natural and that, even before the construction of the wall, use had probably been made of quarry waste to supplement the natural shingle beach. The wall is now very actively interacting with the natural processes of the beach and this has resulted in quite severe erosion, particularly at the northern end.

UNCONSTRAINED SCENARIO

In the absence of defences there would be a rapid erosion and re-adjustment of the shape of the beach, re-establishing a more naturally curved shingle storm beach some 20m back from its current position. The beach would then continue to roll back in line with Sea Level Rise.

COASTAL PROCESSES

Although the wave climate is still dominated by the offshore southwesterly waves, these diffract to approach in a more westerly direction. There are also significant, locally generated, waves from the northwest. The beach, therefore, does tend to readjust depending on the direction of the waves. There is also beach draw down, particularly at the northern end, due to the interaction with the wall.

Wave overtopping is a significant issue although even under a 2m Sea Level Rise Scenario it would not be anticipated that the properties behind would suffer any regular inundation.

MANAGEMENT SCENARIOS

No ACTIVE INTERVENTION – BASELINE SCENARIO 1.

Under this scenario the existing defences would be allowed to fail as they are doing at present. The potential for subsequent retreat of the beach crest has been estimated during the recent study and is shown in the figure inset in this text. This shows the predicted position of the shoreline under different water level scenarios.



Under this scenario there could be future loss to the ruins of the old cottages to the north, but the access road and existing properties would not be affected. There would be a substantial loss of car park area with impact on tourism and recreation.

WITH PRESENT MANAGEMENT – BASELINE SCENARIO 2.

The existing policy is for Hold The Line, with the potential for future retreat. The recent study, although undertaken to inform decision making at a local level, did highlight continuing to defend the existing line would become increasingly difficult and would result in significant further beach loss in the near future. The study did identify the opportunity for re-use of the rock behind the wall as a means of managing the retreat of the shoreline, further safeguarding access and areas of car parking.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

During the recent study, it was identified that there would be insufficient economic justification for maintaining the existing defences. Furthermore, to retain the defences would result in deterioration of the beach and potential damage to both the use of the area and the natural environment. The re-use of the existing armour stone does provide good opportunity for Managed Realignment of the area, achieving a potential balance between these two important aspects of the bay.

The policy for the area is, therefore, Managed Realignment with the intent to restore the natural function of the shoreline, while sustaining use of the area.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

There would be no loss of existing properties due to erosion or flooding. There would, however, be loss from the car park area under the NAI scenario.

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
	Red	Orange	Green	Red	Orange	Green
Reduce risk to life.		Orange		Red		
Protect properties from flood and erosion loss.		Orange			Green	
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.			Green	Red		
Maintain access to the coast including car parking and facilities.	Red					Green
Maintain character and integrity of coastal communities.			Green		Orange	
Identify risk and reduce risk of loss of heritage features where possible.			Green			Green
Maintain historic landscape.			Green			Green
Prevent disturbance or deterioration to historic sites and their setting.		Orange				Green
Maintain or enhance the condition or integrity of the international (SAC, SPA) designated sites and interest features within the context of a dynamic coastal system.			Green	Red		
Maintain or enhance the condition or integrity of the national (SSSI) designated sites and interest features within the context of a dynamic coastal system.			Green	Red		
Avoid damage to and enhance the natural landscape.			Green	Red		
Maintain the human landscape and character of communities.		Orange		Red		

4.6 Porth Gain

DESCRIPTION

The village of Porth Gain is set back well within the valley. The interaction with the coast is the historically significant old industrial port, associated with the quarry industry. The port is created by the enclosure of a large drying harbour area by two substantial breakwaters. The port entrance faces out to the northwest and is exposed to a high degree of wave action through the relatively wide entrance between the natural headlands. The harbour and associated buildings on the western side of the harbour are designated as a SAM. The main harbour building is a listed structure. The area does not fall within nature conservation designations but is part of the Heritage Coast.



UNCONSTRAINED SCENARIO

In the absence of the harbour the bay would have been deeper and there would have been a small beach at the head of a natural valley.

EXISTING DEFENCES

The main defence comprises all the harbour structures along the western side of the bay and at the back of the bay, including the breakwaters to either side of the entrance. These structures create a totally artificial section of shoreline.

COASTAL PROCESSES

The harbour entrance is exposed to significant wave activity. The bay is artificially controlled. There is some substantial increased risk of flooding of the harbour area but this would not extend to the properties of the main village.

MANAGEMENT SCENARIOS

No ACTIVE INTERVENTION – BASELINE SCENARIO 1.

Under this scenario the harbour structures would be allowed to fail. The important historic aspect of the area would be lost.

WITH PRESENT MANAGEMENT – BASELINE SCENARIO 2.

The existing policy is for holding the line. This will require significant investment in maintaining structures but would be fundamental in maintaining the important historic record. The pressure on defences will increase with Sea Level Rise, most especially in relation to the entrance structures. The actual quay levels are above the level of normal tides even under a 2m Sea Level Rise Scenario. However, there could be increased flood risk to the Harbour building at the back, due to wave overtopping. The structures are seen as being sustainable but associated with significant cost in the future

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The principal drive for maintaining defence of the harbour is for the historic and tourism value it brings to the area. As such, works to sustain the harbour are unlikely to be available solely through normal coast protection funding. However, with this caveat, and given the significance of the harbour the policy for the area would be Hold The Line.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

There is no loss to property from either flooding or erosion in this area. There would be substantial loss to the historic and heritage value of the area under a NAI scenario.

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
	Red	Orange	Green	Red	Orange	Green
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.	Red				Orange	
Maintain access to the coast including car parking and facilities.	Red					Green
Maintain access for boat use	Red					Green
Identify risk and reduce risk of loss of heritage features where possible.	Red					Green
Maintain historic landscape.	Red					Green
Prevent disturbance or deterioration to historic sites and their setting.	Red					Green
Avoid damage to and enhance the natural landscape.		Orange			Orange	
Maintain the human landscape and character of communities.	Red					Green

4.7 Abercastle

DESCRIPTION

The village of Abercastle sits within a steep sided valley at the back of a narrow sandy bay,



opening to the northwest. The main properties making up the village are set back from the beach area and there is only one property close to the shoreline. The beach is notable in that it is predominantly sand with no obvious shingle ridge. There is a small boating hard at the back of the beach and a small stream runs down the valley before being diverted to the back of the hard and through to the beach area.

EXISTING DEFENCES

The only defences are a low wall retaining the boating hard. This is at the crest of the natural beach. There appears to be little interaction between the defence and the beach. There are minor bank protection walls to the stream.

UNCONSTRAINED SCENARIO

In the absence of defences, the crest of the beach would be slightly further back and the position of the stream would tend to move, within the valley.

COASTAL PROCESSES

It is anticipated that the head of the bay would be exposed to only a very limited direction of wave action, gaining significant shelter from the dominant wave directions.

It also seems probable that the boat hard is constructed over a natural backshore berm and that the wall was constructed to formalise this as a working area.

There is some risk of erosion to the backshore area and potentially to the coastal slope upon which sits some of the properties of the village. With Sea Level Rise the old backshore berm would want to retreat further up the valley.

MANAGEMENT SCENARIOS

No Active Intervention – Baseline Scenario 1.

Under this scenario the existing defences would be allowed to fail. This would be driven almost solely by Sea Level Rise and the attempt of the backshore berm to retreat. There could be erosion, causing some increased slope instability and this may impact on properties. The retreat of the backshore berm would impact on use of the area and of the existing slipway.

With Present Management – Baseline Scenario 2.

The existing policy is for No Active Intervention but with the possible need in the future to Hold The Line. This policy really seems to reflect the low pressure from erosion at present and refers therefore to the actions needed rather than a policy driving those actions. The intent is therefore interpreted as one of holding the existing line. This would become increasingly difficult with Sea Level Rise and there would be little economic justification beyond safeguarding property on the hillside. With Sea Level Rise of 2m the hard would be regularly flooded on Spring Tides and even with 1m Sea Level Rise the low wall would start interacting far more with the natural beach. This could result in difficulty in maintaining use of the area and access to the shoreline.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The bay creates quite a low energy environment with little exiting pressure on defences. In the short term, while there would be little need for action the policy would be to support continued maintenance and through this maintain the current use of the area.

With Sea Level Rise, possibly over the third Epoch, pressure on the defences would increase and maintaining them would be difficult to justify and may cause damage to the use of the bay. The policy would therefore change to one of managed set back of the defence, allowing natural roll back of the beach. Associated with this might be the need to provide some additional support to the coastal slope, to safeguard property. In setting back the shoreline the aim of management would be to consider how the use of the area, the access to the foreshore and the sea could be maintained. This would need to be undertaken in collaboration with the local community.

SUMMARY COMPARISON AND ASSESSMENT OF BASELINE SCENARIOS.

Table 1. Economic Assessment

The following tables provide a brief summary of erosion and flood damages determined by the SMP2 MDSF analysis for the individual area. Further details are provided in Appendix H. Where further, more detailed information is provided by studies, this is highlighted. The table aims to provide an initial high level assessment of potential damages occurring under the two baseline scenarios.

ASSESSMENT OF EROSION DAMAGES

Epoch	0 -20 year			20 – 50 years			50 – 100 years			50 – 100 years (2m SLR)		PV Damages (£x1000)
	No. of properties:		Value x £k	No. of properties:		Value x £k	No. of properties:		Value x £k	No. of properties		
Location	Res.	Com.		Res.	Com.		Res.	Com.		Res.	Com.	Res.
NAI	0	0	0	0	0	0	0	0	0	0	0	
WPM	0	0	0	0	0	0	0	0	0	0	0	

Notes: PVD determined for 1m SLR in 100 yrs.
Other information:

There are no flood damages identified.

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives. Specific objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

	NAI			WPM		
Reduce risk to life.	Red	Orange	Green	Red	Orange	Green
Protect properties from flood and erosion loss.	Red					Green
Minimise the need for increasing effort and management of coastal defences.			Green	Red		
Avoid reliance on defence particularly where there is a risk of catastrophic failure.			Green	Red		
Maintain access for boat use.	Red			Red		
Maintain character and integrity of coastal communities.		Orange		Red		
Maintain historic landscape.		Orange			Orange	
Avoid damage to and enhance the natural landscape.		Orange		Red		
Maintain the human landscape and character of communities.	Red			Red		

4.8 Aber Mawr and aber Bach

DESCRIPTION



This area is an important and geomorphologically significant area of the coast with Aber Mawr being designated as an SSSI. There are no properties associated with the area, although there is a road and coastal path. There is also farmland within the Aber Mawr valley. The frontage is formed as two small bays separated by a headland. The backshore in both areas comprises a shingle bank.

EXISTING DEFENCES

There are no defences.

UNCONSTRAINED SCENARIO

The bays provide an excellent example of the natural development of open coast.

COASTAL PROCESSES

The frontages are exposed to significant wave action both from the diffracted wave approach from the southwest and more local wave generation from the west and northwest. The beaches act as a natural shingle storm ridge and would be expected to roll back both with Sea Level Rise and as the relatively soft headland erodes.

MANAGEMENT SCENARIOS

No Active Intervention – Baseline Scenario 1.

Under this scenario the coast will adjust naturally. This will result in loss of land behind and the land behind will be subject to increased risk of flooding.

With Present Management – Baseline Scenario 2.

The current policy is for No Active Intervention. With this approach there would be increased flooding of the land behind but no loss of property or impact on the historic environment.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The overall intent of management for this area would be to allow natural development of the shoreline. The area has been considered separately as this is one area where there is a more dynamic shoreline as distinct from the generally harder rock cliffs of most of the Zone

5

Management Summary.

The overall intent for managing this area of the coast is to allow the natural development of the shore. There are specific local areas where such an approach would have potentially significant consequences and these have been examined separately in the discussion above. Because of the significant natural value of the area, the whole Zone is seen as one Management Area with the overarching policy of No Active Intervention. Within this area, local Policy Units are then defined. The policies are summarised below.

M.A.4 ST DAVID’S PENINSULA TO STRUMBLE HEAD: From Dinas Fach to Pen Anglas

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
3.1	Dinas Fach to Pen Anglas	NAI	NAI	NAI	Overarching policy unit setting the base intent for the zone.
3.2	Lower Solva	HTL	HTL	MR	Adaptation planning for the area needs to be developed.
3.3	Solva Harbour	HTL	HTL	HTL	This policy would be subject to a collaborative approach to funding.
3.4	Porth Clais outer	HTL	NAI	NAI	This would not preclude local management subject to normal approvals.
3.5	Porth Clais inner	HTL	HTL	HTL	This policy would require collaborative planning and funding.
3.6	St Justinian’s	NAI	NAI	NAI	This policy would not preclude management of the RNLI Station and ferry service subject to normal approvals.
3.7	Ramsey Island	NAI	NAI	NAI	This policy would not preclude improvement to maintain access, subject to normal approvals.
3.8	Whitesands bay	HTL	MR	MR	Managed long term process of retreat.
3.9	Abereiddi	MR	MR	MR	Managed long term process of retreat.
3.10	Porth Gain	HTL	HTL	HTL	Significant funding issues.
3.11	Aber Castle	HTL	MR	MR	Maintain the use of the area and support the local community by setting back local defences.
3.12	Aber Mawr	NAI	NAI	NAI	Monitor as an example of natural response to Sea Level Rise.
Key: HTL - Hold The Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

PDZ3
Management Area Statements

MA4 St David's Peninsula to Strumble Head
Dinas Fach to Pen Anglas

Location reference:	St David's Peninsula to Strumble Head
Management Area reference:	M.A. 4
Policy Development Zone:	PDZ3

* Note: Predicted shoreline mapping is based on a combination of monitoring data, analysis of historical maps and geomorphological assessment with allowance for sea level rise. Due to inherent uncertainties in predicting future change, these predictions are necessarily indicative. For use beyond the purpose of the shoreline management plan, reference should be made to the baseline data.

The following descriptions are provided to assist interpretation of the map shown overleaf.

100 year shoreline position:

The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Draft Preferred Policy" being put forward through the Shoreline Management Plan.

-  In some areas the preferred policy does not change from that under the existing management approach. In some areas where there are hard defences this can be accurately identified. In other areas there is greater uncertainty. Even so, where the shoreline is likely to be quite clearly defined by a change such as the crest of a cliff the estimated position is shown as a single line.
- Where there is a difference between With Present Management and the Draft Preferred Policy this distinction is made in showing two different lines:

-  With Present Management.
-  Draft Preferred Policy.

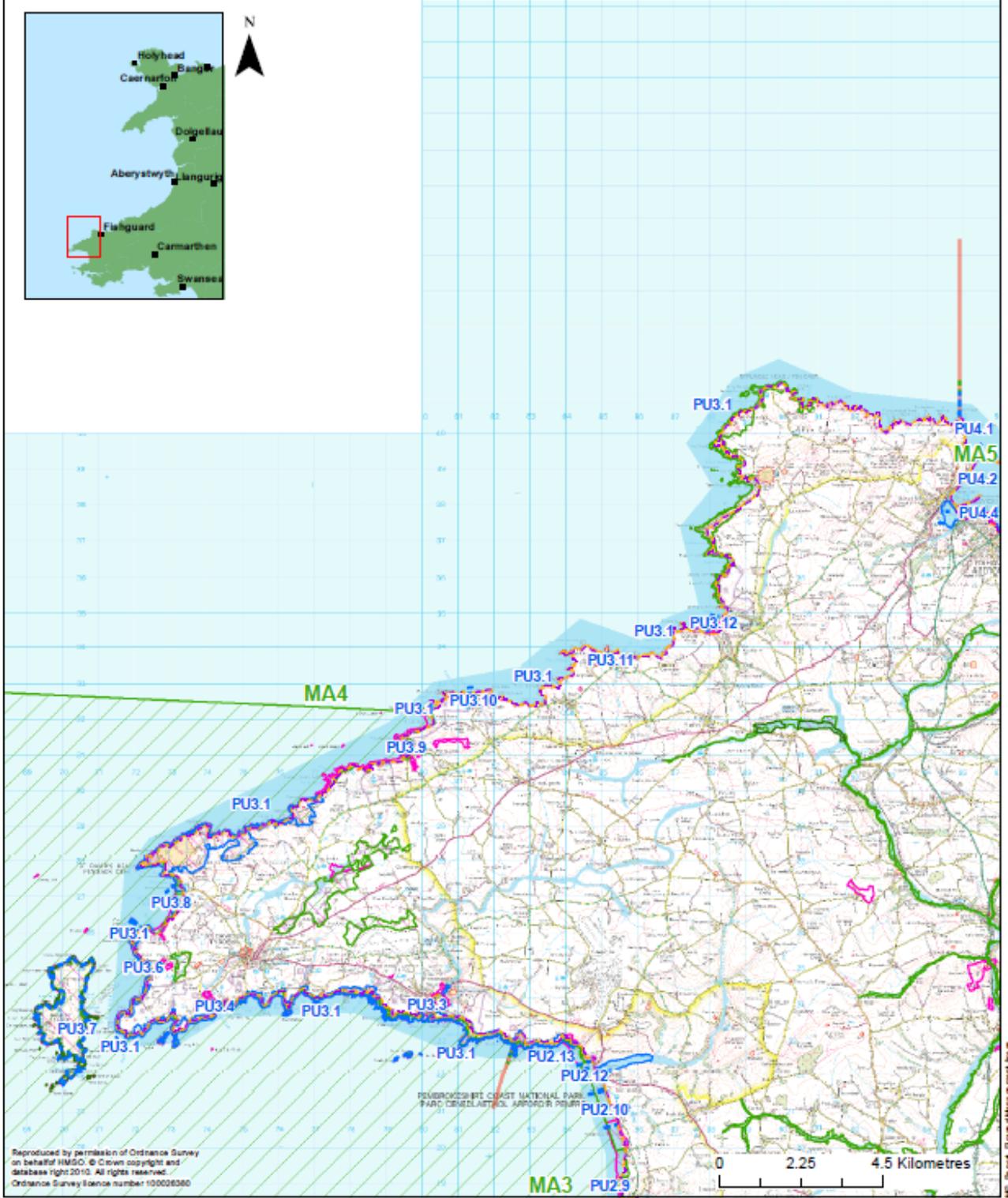
Flood Risk Zones

-  General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this Draft SMP document show where SMP policy might influence the management of flood risk.
-  Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.
-  Indicate where over the 100 years the policy would allow increased risk of flooding.

The maps should be read in conjunction with the text within the Draft SMP document.

Shoreline Management Plan Sub Cell 10
 Baseline Location Map
 Management Area 4

- Management Area
- Policy Unit
- Policy Development Zone
- Scheduled Monument



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Key	
	100 Year Shoreline Position:
	Preferred Policy would be the same as With Present Management
	With Present Management where this differs from the Preferred Policy
	Preferred Policy where this differs from the With Present Management
	Ramsar
	SAC
	SPA
	SSSI
	NNR
	Existing Indicative EA Flood Zone 3
	EA Flood Risk Zone 2 where under the SMP policy there would be increased probability of flooding



SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

INTENT OF THE PLAN:

The underpinning intent of the plan is to work towards a natural functioning coast, limiting any further intervention at the shoreline and supporting the important nature conservation and landscape values of the area. Within this, there is a recognition of the valuable communities such as Solva, Abereidly, Port Gain and Abercastle that support cultural values and provide an important tourism resource. It is the intent of the plan to support these communities, as they adapt to sea level rise, in order that the character and function of the communities is maintained.

One of the most significant aspects is the need to adapt land use at Lower Solva, to allow sustainable flood management. This may incur the loss of properties and local resilience measures being taken where property is exposed to greater risk. The aim is to manage risk and defence to the area in such a manner that the important connection between the village and its access to the waterfront is not destroyed. This will require a more adaptive approach working with the local community. Solva and Port Clais, and to a lesser degree Abercastle and Port Gain, also provide important local harbours. The aim of the plan is to sustain this use but this would require alternative sources of funding.

Whitesands Bay, with its associated facilities, is an important tourism and heritage location. The intent of the plan is to sustain this use but recognising that there will be a need to allow roll back of the shoreline if the beach and access to the beach is to be maintained. At Abereidly the existing defences are failing, but this could be managed to allow realignment of the shoreline. This would maintain the amenity beach, partially retain use of the car park and access and improve natural protection to properties. The RNLI station and the new station planned at St Justinian's would not impact on shoreline management. In developing this area consideration needs to be given to maintaining access to the islands.

KEY ISSUES/RISK AND UNCERTAINTY:

There are uncertainties in terms of timing of the proposed changes and available funding. There is also a need for a detailed planned response to change. It will be important to relate this to national monitoring of sea level rise and climate change. To deliver the plan there will be a need for collaborative funding, involving private individuals, tourism and potentially heritage funding. Only at Lower Solva are there clear and significant flood risk benefits. In other areas, including Solva Harbour, benefits derive from community or regional benefits. Without additional funding, other than purely that from flood and coastal erosion risk, the default policy is likely to be NAI.

ACTIONS:

ACTION	PARTNERS
Shoreline monitoring	PCC
Adaption planning	PNP
<ul style="list-style-type: none"> ▪ Solva. ▪ Abereidly ▪ Abercastle 	<ul style="list-style-type: none"> ▪ Porth Clais ▪ Whitesands
Assess in detail potential impact on historic environment	PNP
Plan relocation of coastal path	PNP

DELIVERY OF THE PLAN

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
3.1	Dinas Fach to Pen Anglas	NAI	NAI	NAI	Overarching policy unit setting the base intent for the zone.
3.2	Lower Solva	HTL	HTL	MR	Adaptation planning for the area needs to be developed.
3.3	Solva Harbour	HTL	HTL	HTL	This policy would be subject to a collaborative approach to funding.
3.4	Porth Clais outer	HTL	NAI	NAI	This would not preclude local management subject to normal approvals.
3.5	Porth Clais inner	HTL	HTL	HTL	This policy would require collaborative planning and funding.
3.6	St Justinian's	NAI	NAI	NAI	This policy would not preclude management of the RNLI Station and ferry service subject to normal approvals.
3.7	Ramsey Island	NAI	NAI	NAI	This policy would not preclude improvement to maintain access, subject to normal approvals.
3.8	Whitesands bay	HTL	MR	MR	Managed long term process of retreat.
3.9	Abereiddi	MR	MR	MR	Managed long term process of retreat.
3.10	Porth Gain	HTL	HTL	HTL	Significant funding issues.
3.11	Aber Castle	HTL	MR	MR	Maintain the use of the area and support the local community by setting back local defences.
3.12	Aber Mawr	NAI	NAI	NAI	Monitor as an example of natural response to Sea Level Rise.
Key: HTL - Hold The Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain existing defences. Address safety issues at Abereiddi and develop realignment approach. Develop adaptation planning. Develop funding plan.
Medium term	Maintain defences while moving towards adaptive management
Long term	Implement community based adaptation.

IMPLICATIONS OF THE PLAN

CHANGES FROM PRESENT MANAGEMENT

At Solva, Porth Clais and Abercastle the approach to management changes from a general approach of Hold the Line to one where a more adaptive approach is recommended. At Aberreiddi, the previous policy for Managed Realignment in the long term is brought forward to epoch 1.

ECONOMIC SUMMARY

Economics (£k PV)	by 2025	by 2055	by 2105	Total £k PV
Potential NAI Damages	47.0	71.6	596.3	714.8
Preferred Plan Damages	47.0	37.2	357.2	441.4
Benefits	0.0	34.3	239.1	273.4
Costs of Implementing plan	178.1	855.0	43.3	1,076.4

FLOOD AND EROSION RISK MANAGEMENT

POTENTIAL LOSS

There is likely to be loss of property and areas of the car park in the longer term at Whitesands due to erosion. At Solva there would be increased risk of flooding and the potential loss of property as a more adaptive approach is developed to reduce flood risk and sustaining the community.

BENEFITS OF THE PLAN

The plan provides a longer term sustainable approach to defence, maintaining defence to the core community areas. The flood risk to Solva would be managed to sustain the community in the long term.

SUMMARY OF STRATEGIC ENVIRONMENTAL ASSESSMENT (INCLUDING HRA)

PDZ 3				
SEA Objective	Impact of Preferred Policy for each Epoch			
	1	2	3	Mitigation
Policy Units 3.1 to 3.12				
To support natural processes, maintain and enhance the integrity of internationally designated nature conservation sites. Maintain / achieve favourable condition of their interest features (habitats and species).	Red	Red	Red	Habitat creation
To avoid adverse impacts on, conserve and where practical enhance the designated interest of nationally designated nature conservation sites. Maintain/achieve favourable condition.	Red	Red	Red	Habitat creation
To avoid adverse impacts on, conserve and where practical enhance national and local BAP habitats.	Red	Red	Red	Habitat creation
To support natural processes and maintain geological exposures throughout nationally designated geological sites.	Orange	Orange	Orange	Monitoring and appropriate design
To conserve and enhance nationally designated landscapes in relation to risks from coastal flooding and erosion and avoid conflict with AONB and National Park Management Plan Objectives.	Green	Green	Green	Appropriate design
To minimise coastal flood and erosion risk to scheduled and other internationally and nationally important cultural heritage assets, sites and their setting.	Red	Red	Red	Excavation and recording
To minimise the impact of policies on marine operations and activities.	Light Blue	Orange	Orange	
To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services.	Green	Green	Green	Relocation or realignment
To minimise coastal flood and erosion risk to agricultural land and horticultural activities.	Light Blue	Light Blue	Light Blue	
To minimise coastal flood and erosion risk to people and residential property.	Light Blue	Orange	Orange	Relocation
To minimise coastal flood and erosion risk to key community, recreational and amenity facilities.	Light Blue	Green	Red	Realignment of coastal path (PU 3.12)
To minimise coastal flood and erosion risk to industrial, commercial, economic and tourism assets and activities.	Light Blue	Light Blue	Light Blue	

Mitigation associated with the impacted features of the historic environment may include excavation and recording and monitoring of erosion rates.

This table provides a summary of the SEA (appendix E) and reference should be made to the Appendix for full details of the assessment.

These next two sections provide a headline summary of the findings of the HRA (Appendix G) and the WFA (Appendix H). Reference should be made as appropriate to these Appendices for full details.

HRA SUMMARY

Designated Site	PU	Habitat Type	Extent of Loss of Habitat (ha)			
			Epoch 1	Epoch 2	Epoch 3	Total
Pembrokeshire Marine SAC	3.2	Intertidal sandflat	0.17	0.03		0.19
	3.3	Intertidal sandflat	0.08	0.38	0.08	0.53
	3.4	Intertidal sandflat	0.01			0.01
	3.5	Intertidal sandflat	0.01	0.04	0.03	0.08
	3.8	Intertidal sandflat	0.02			0.02

Pembrokeshire Marine/ Sir Benfro Forol SAC: It is concluded that there would be an **adverse effect on the integrity** of the intertidal sandflat habitat within the boundary of the SAC as a result of the SMP2 policies. There will however, be no adverse effect on the integrity of the other SAC features.

Preventative/mitigation measures: Potentially move the defences landward where feasible, to allow sandflats to roll back in time with sea level rise, and investigate possibilities for Whitesands Bay.

SUMMARY CONCLUSION FROM THE WATER FRAMEWORK ASSESSMENT

This area was scoped out of the assessment.

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