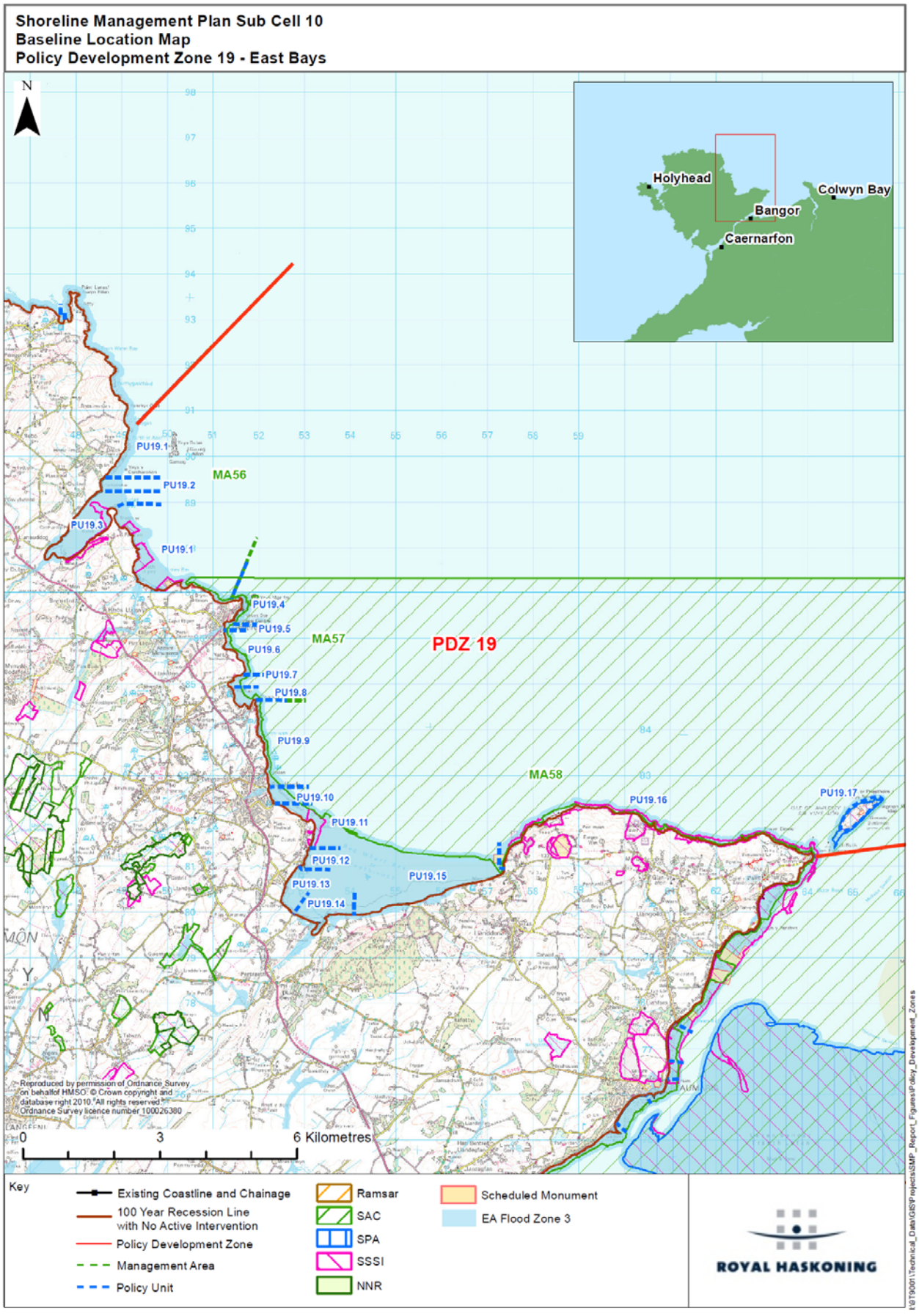
PDZ 19. EAST BAYS:

Traeth Coch/ Red Wharf Bay

Trwyn Cwmrwd to Trwyn Penmon

CONTENTS


Shoreline Management Plan Sub Cell 10
Baseline Location Map
Policy Development Zone 19 - East Bays
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Holyhead
Colwyn Bay
Bangor
Caernarfon
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0
3
6 Kilometres
Key
Existing Coastline and Chainage
100 Year Recession Line with No Active Intervention
Policy Development Zone
Management Area
Policy Unit
Ramsar
SAC
SPA
SSSI
NNR
Scheduled Monument
EA Flood Zone 3
ROYAL HASKONING

Definitions of Scenarios Considered in Policy Development

This section defines the various scenarios that are used throughout the discussion of the Policy Development Zone.

Sea Level Rise
It is recognised that there is a continuing uncertainty with respect to Sea Level Rise (SLR). Taking different SLR scenarios may affect the scale of impact or the timing of some changes, either in terms of sustainable management or in terms of impacts. In the discussion below of the baseline and alternative management scenarios, the Defra guidance on SLR has been generally been used. Where, in any specific area, the impact of SLR is felt to be significant and may change the context of management this discussion is held within a separate box, relevant to that section of text.

Management scenarios;

Unconstrained Scenario
Under this scenario, the behaviour of the coast is considered as if there were no man made defences, effectively if they were suddenly not there. Although recognised to be a totally theoretical scenario it does provide a better understanding of how we are influencing the coastal behaviour and therefore the stresses and broader scale impact that are introduced. This assists in assessing first how the coast might wish to change, but also in defining the limits of interaction which the SMP should be considering.

Baseline Scenarios

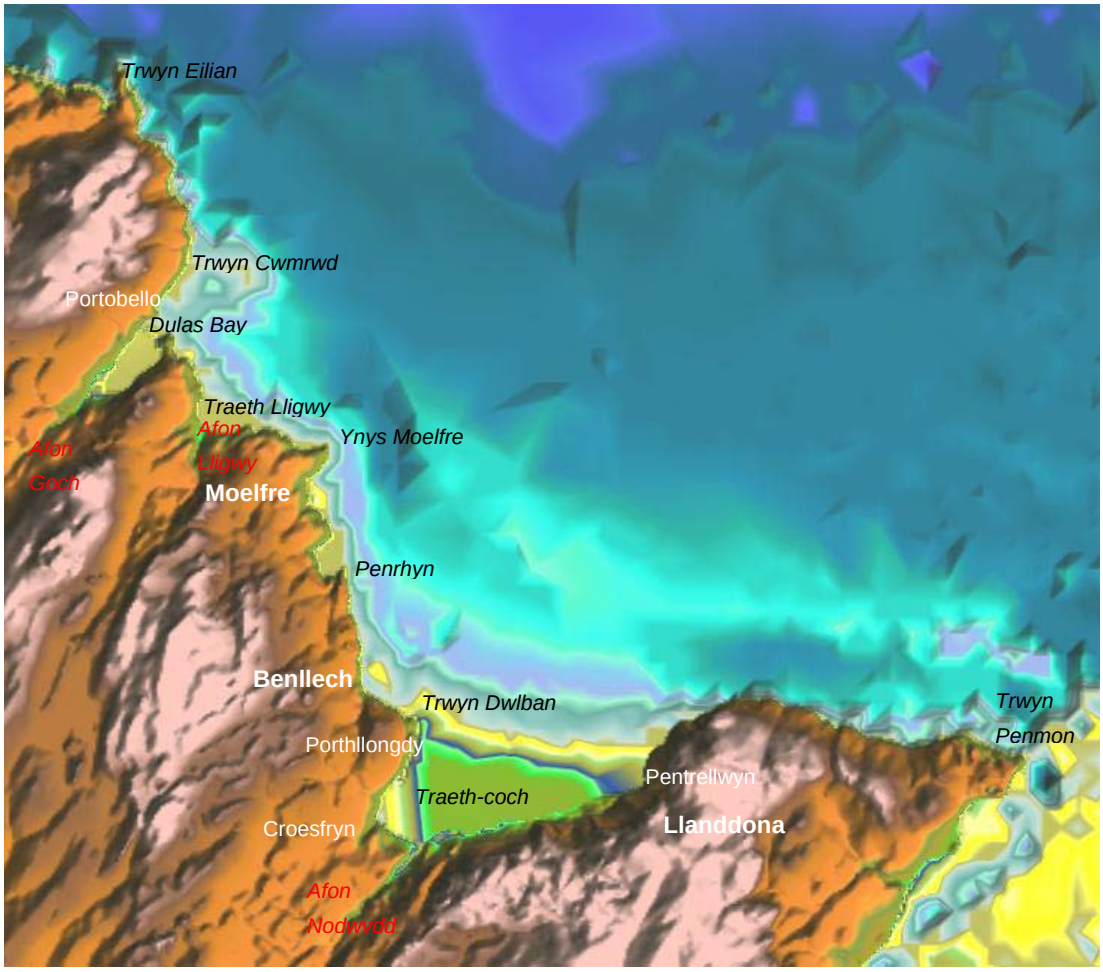
- ***No Active Intervention (NAI) – Scenario 1****, where* there would be no further work to maintain or replace defences. At the end of their residual life, structures would fail. There would be no raising of defences to improve standards of protection.
- ***With Present Management (WPM)– Scenario* 2**. This scenario applies the policies set in the SMP1 or, where relevant, takes updated or clarified policies, if subsequent work has been undertaken e.g. studies or strategies. In many locations, the approach to management defined by SMP1 only covers a 50 year period. Where this is so, the intent of how the coast is being managed has been assumed to apply into the future. It should be noted that WPM does not necessarily imply a Hold The Line approach throughout the zone, in many areas present management may be for a No Active Intervention approach or one of Managed Realignment.

The aim of the No Active Intervention is to identify what is at risk if defences were not maintained. In a similar way, With Present Management aims to examine how the coast may develop, identifying where there are benefits in this management approach or where there may be issues arising in the future.

At the end of this sub-section a brief summary and comparison of the economic risk for each of the baseline scenarios is provided, based on the MDSF (Modelling Decision Support Framework) analysis undertaken during the SMP (including other study findings where relevant). The baseline scenarios are also assessed in terms of how they address the overall objectives for the Zone. This comparison between the baseline scenarios sets the scene for discussing possible alternative management scenarios which better address all the issues. This discussion is provided in the subsequent sub-section.

1 Local Description

The Zone extends from the headland of Trwyn Cwmrwd north of Dulas Bay to Trwyn Penmon, the western headland to Bae Conwy. The frontage is effectively split into two principle units by the headland at Ynys Moelfre that limits interaction between Dulas Bay/Lligwy Bay in the north and the series of bays: Moelfre, Traeth Bychan, Traeth Benllech and Traeth-coch to the south. In between the various bays, the coast is comprised of the high rock cliffs.



From the headland at Trwyn Cwmrwd the cliffs descend into the estuary of the Afon Goch and Dulas Bay. There is a small frontage with properties at Portobello just to the north of the Dulas Estuary. The valley of the Afon Goch, the main river flowing into the Dulas Estuary, was drowned following the last glaciation and has subsequently been filled with sediment to produce the landscape that is present today. The Afon Goch flows across Traeth Dulas, the expanse of sand and mud that forms the estuary, and out to the sea past an inner sand spit that extends across the estuary mouth from the south. The spit is formed behind the rock outcrop and promontory at Craig y Sais. At the shoreline there is a smaller spit extending from the northern side of the estuary. The southern bank of the estuary and the inner spit are both recognised for their environmental value under designation as a SSSI. There are a few isolated properties along the relatively steeply rising shoreline of the estuary, and the majority of the land is in agricultural use. Access to the properties is along minor roads and the A5025, main coastal road, crosses the Afon Goch at City Dulas at the narrowing head of the estuary.

To the south of the Dulas Estuary are two small sandy beaches of Traeth yr Ora and Porth y Mor, separated by the rock outcrop of Graig Ddu. Both beaches are only accessible by foot and as a result are undeveloped. Beyond the next rock outcrop and minor headland of Trwyn Porth-y-Mor is the far larger beach of Traeth Lligwy, where the Afon Lligwy discharges across the beach. This location is accessible by minor roads from the north and south with car parks at the end of both. The caravan parks above the beach, although not at risk from flooding or erosion, reflect the importance of the beaches in this area and the significance of the whole natural shoreline in this northern section of the zone as an amenity and tourism area. The open coast of Traeth Ora through to the southern part of Traeth Lligwy contains three areas of SSSI and there is the prominent Traeth Lligwy Fish Weir (SAM) over the shoreline at the south end of Traeth Lligwy. The area falls within the designation of an Area of Outstanding Natural Beauty. This designation continues over the whole of the rest of the zone.

South of Lligwy and for the rest of the coast to the south, to Trwyn Penmon, the area below low water is designated under the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC.

Between Traeth Lligwy and the headland at Ynys Moelfre, which marks the limit of the northern half of the zone, are the two small bays of Porth Forllwyd and Porth Helaeth. At Porth Forllwyd there is a single property at the side of the beach accessible by a single track road. Porth Helaeth has a small shingle beach and there is a small caravan park on the cliffs above. The beach is only accessible by footpaths.

Between the headland at Ynys Moelfre, south to Benllech, the shoreline is dominated by its hard rock cliffs, with the high ground rising inland to Mynydd Bodafon. Within this central cliffed coastal section of the coastline are the two bays of Moelfre and Traeth Bychan and then the relatively straight section of cliff line centred on Borth-wen, between Penrhyn and Huslan, just north of Benllech.

The village of Moelfre is located to the south of Ynys Moelfre and is one of the two major settlements in this zone. Towards the northern end of the village is the lifeboat station, the old boat house and the Seawatch Marine centre, at Porth Lydan. At Porth Moelfre, the main frontage, where the road and houses are located at the shoreline, there is a slipway and boats are kept on the small beach. The majority of the village is located on the slopes above the shoreline, outside the influence of coastal processes. At the sea front, which is an essential element of the village, the road protected by a sea wall runs steeply down to the short section of shingle beach, before climbing up over the rock outcrop on the southern side.

Traeth Bychan is the next bay to the south, which at low water has an extensive sandy beach, while at high water this is split into two sections in the north and south corners of the bay, separated by rock outcrops. In the northern corner of the bay there is a slipway and the Red Warf Bay Sailing and Watersports Club. Some dinghies are stored at the top of the beach and others in the boat park to the east of the slipway. There is a car park behind the beach and several properties. In addition there are lime kilns at the high water mark that are listed buildings. There is another slipway at the southern end of the bay also for the launching of dinghies, which are stored in a boat park on the cliffs above. There are caravan parks of the cliffs above the whole of the bay.

From the headland marking the southern limit of Traeth Bychan, southwards, the coast is comprised of high cliffs until the village of Benllech. The land use at the top of these cliffs is initially agricultural fields, however just to the north of Benllech there is a

campsite and a caravan park. Benllech is the largest coastal community within this area of the coast and is an important tourist destination with an extensive amenity beach area at low water. As with Moelfre the main part of the village is high up on the coastal slope and there is only a small frontage at the water's edge. Beach Road runs along the back of the beach over the rocky outcrop between the rocky shingle backed upper beach at the north end of the sea front and the relatively large area of drying sandy beach to the south. The Afon y Marchogion outflows at the northern end of the bay. The road is protected by a sea wall promenade for its entire length apart from at the slipway at the southern end, opposite the Wendon Café. There is a long outfall pipe extending over the foreshore at the northern end. The southern end of the beach is the main centre of beach use, with the main car park and access.

Northern part of Benllech, looking towards the Huslan Cliffs

Traeth Benllech, looking towards Trwyn Dwlban

There is a sewage works at the crest of the cliffs to the southern end of the beach.

Traeth Benllech is separated from Traeth-coch by the cliffs and headland of Trwyn Dwlban, which are designated as an SSSI. At the top of the cliffs are several caravan parks and a boat club that has a slipway, which descends to the shoreline through a narrow gap in the cliffs.

Traeth-coch is the most extensive bay within this zone and acts an evident sediment sink. It has developed from the drowned valley of the Afon Nodwydd that now discharges across the extensive sands in a narrow channel on the north western side of the bay. The river flows out along the northern side of the bay and the main central section of the bay comprises a high sandy ridge with a distinct ridge and runnel system of banks on its seaward face. The inner reaches of Traeth-coch are more estuarine in nature with areas of mudflat and saltmarsh.

Traeth-coch from car park at Porthllongdy

Along the northern flank of the shoreline is the village of Porthllongdy. This comprises a collection of properties stretched along the shoreline, with a caravan park to the rear. Below the caravan park a minor road leads to a small car park, a pub; the Ship Inn, which is a grade II listed building, and a slipway and mooring area. The mooring area is mainly behind a shingle sand spit which extends south into the bay.

There are various other properties further south from Porthllongdy in the area of Croesfryn, where at two locations minor roads run down to the shoreline. There are

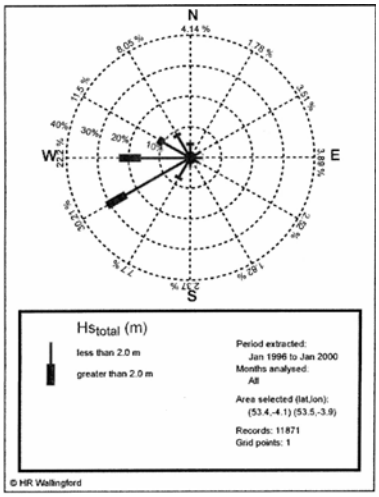
further properties at the shoreline at the head of the bay at Talgwyn through to Pen-y-prys where the Afon Nodwydd enters the bay. There is a small car park at Pen-y-prys and the small bridge that crossed the river there is a listed building. The bridge provides access to a track that runs along the back of the shoreline and provides access to properties along this frontage and to property on the higher ground back from the shoreline.

The Afon Nodwydd marks the change in the backshore from the marsh and mudflats to the west and the increasingly sandier frontage along the gently rising coastal slope of the eastern frontage. The main beach is located on the eastern side below the village of Llanddona. There a minor road runs directly behind the shingle backed beach and there is a car park for visitors and properties to the back of the road.

To the east of Traeth-coch the coast rises to high cliffs for the remainder of the zone to Trwyn Penmon. The cliffs are designated for their environmental value as SSSI and SAC. At Trwyn Du, the most easterly point on Anglesey the lighthouse and lighthouse keeper's cottages are listed buildings. Ynys Seiriol/Puffin Island, just offshore from Trwyn Penmon is designated for its environmental importance as a SAC, SPA and SSSI.

The small village frontages and local beaches of this eastern shoreline, set within the broader context of the spectacular natural cliffed coastline, are a significant ecological, cultural, amenity and tourism resource of Ynys Mon. The main issues are in relation to local management of areas but with a key aspect of management being the aim to maintain that important natural aspect reflected in the objectives for the Area of Outstanding Natural Beauty. However, there are sufficient links between sections of the coast that, while the coast may be sub-dived to a degree in to three principle areas, within these areas each is sensibly consider as a whole. The broad division is the northern section of coast around Dulas Bay, the area of Moelfre and Traeth Bychan and the area from Benllech and Traeth-coch. In the first of these the main driver is maintaining that important natural function of the coastal area and estuary. In the Moelfre area there is important local issues relating to the community and the local use of the shoreline. In the southern area the use of the shoreline area becomes more significant with beach use, boating. The area is slightly more developed with more properties at risk from flooding and erosion.

2 Coastal Processes



The Traeth Lligwy Management Study, determined an off shore wave climate dominated by, both swell waves and locally generated waves, from a west to south west direction (adjacent plot). However, the whole area gains significant shelter from offshore waves from this westerly quadrant, such that the main wave energy is approaching from the northwest through to north, diffracting around the northeast headland of Ynys Mon. There is some wave energy from a north east to east direction and while this local fetch can generate significant storms locally, such directions make up only a small percentage of the main energy directed at the shoreline. Futurecoast suggests the main inshore wave climate is from north to east, taking account of the diffraction of waves from the offshore.

A general review of the shoreline orientation along the softer frontages is consistent with this northeast inshore wave climate and the suggestion is that the main lower foreshore processes and coastal shape is dominated by the principal swell (longer period) climate. This is further supported by the development of distinct ridge and runnel features of the shore; as shown in the adjacent air photograph at Lligwy, and by similar features observed over the outer beach of Traeth-coch, indicating a good supply of sediment. The underlying process is of sediment being held against the coast within the three main bays (Dulas, Lligwy and Traeth-coch) and being contained by the prominent hard geology. Superimposed on this is the local interaction at the back shoreline, where waves interact with the upper shoreline features, defences and orientation of the exposed harder geology. Typically this tends to bias sediment drift in a southerly direction, but with the potential for some net drift reversal at key points in the system. This is discussed in relation to the various sections of the coast below.

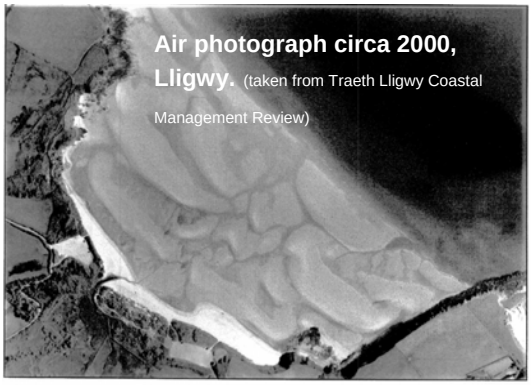
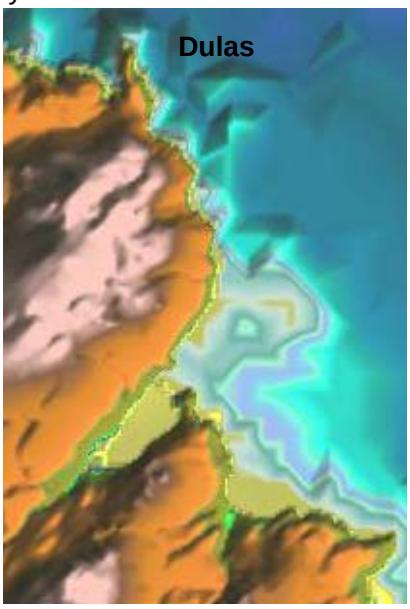


Figure 2 - Aerial Photograph of Traeth Lligwy, circa 2000



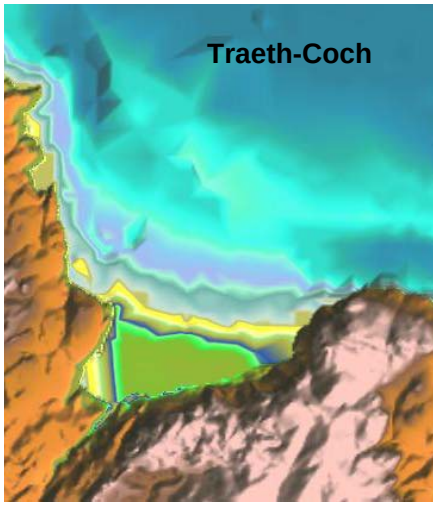
Along the northern section of the zone, there are the three main bays of Dulas, Traeth yr Ora and Traeth Lligwy, separated respectively by the Dulas Estuary, the Craig y Sais headland and the headland of Trwyn Porth-y-Mor. The alignment of these bays has a strong continuity, sweeping around from a near north/south orientation in the north, to the northwest/southeast orientation of Traeth Lligwy. The northern shoreline gains some addition protection from Ynys Dulas. The spit, to the north of the estuary, appears far more to be acting as a backshore barrier than as an active drift aligned spit. This is supported by fact that, even with limited sediment supply there is a relatively healthy beach in front of the Portobello. In effect the estuary cuts

through the barrier, rather than the barrier forcing the channel to the south. The estuary assessment (Appendix C) suggests a theoretical ebb dominance over the whole estuary, but acknowledges a complexity of behaviour which would suggest the future capacity of the estuary to infill as sea level rises. The Afon Goch is not seen as providing significant fresh water flows and this is supported by the fact that, within the estuary, the main channels fan out from the entrance and are formed more as a drainage system to the estuary rather than as a continuation of the river channel. The inner spit, in much the same way as the outer spit seems far more a barrier beach formed by wave action setting back a shoreline behind the entrance channel. This has resulted in a thinning of the centre of the spit, making it quite vulnerable to breach with increasing sea level rise.

Sea Level Rise
There remains significant uncertainty as to the future behaviour of the estuary and estuary mouth. As sea level rises, particularly under a 2m scenario, the outer shoreline would be expected to move back, reducing the width of the beach and spit at the entrance. Quite probably the inner spit would, however, breach, creating a new central entrance to the estuary system; unless there is some underlying geological feature preventing this. This would tend to allow increased beach sediment in to the estuary, reinforcing the build up of the sediment in the central part of the estuary. This would further close off the head of the estuary and encourage warping up of the marsh in this area. With the increased draw of sediment into the estuary, it seems probable that there would be increased loss of sediment from the beach to the north.

Traeth yr Ora appears relatively stable in alignment and is likely to remain so. It will attempt to roll back with sea level rise. This will result in erosion of the clay cliffs behind, creating the necessary width to maintain the sand beach in front.

The management review for Traeth Lligwy (2003) identified that over the previous 15 years there had been a general lowering of the upper beach, north of the Lligwy, and that this had become increasingly critical during 2002. The inspection and review of historic information suggested that the main beach was relatively stable. While there is a limited general sector of wave exposure, within that quadrant between north and east, there can be significant local variation from within this sector. From the discussion in the review report, it seems probable that the backshore can be sensitive to small change in wave direction. It may also be that the reported lack of major storms over recent years may have tended to reduce sediment being moved up the beach. Overall, the bay is seen as being relatively stable but the backshore will roll back and the clay underlying the beach will need to be exposed and to erode to allow a progressive movement of the whole profile back in line with sea level rise.



Over the southern section of the coast, south of Ynys Moelfre, there is the rugged but relatively sheer northerly cliffed frontage, held by the hard rock cliffs. This gives way to the sweeping sediment filled extent of Traeth-coch.

The northern frontage, within this section, may gain some limited protection from the ridge some 2km offshore, although this is at a chart depth of some 10m; this may only, therefore, affect long period waves. Possibly a significant affect would be increased tidal flow against the shoreline and this may explain the deep channel between the ridge

and the shoreline at the northern end of the area. However, there is little information about flows in this area. More importantly, from a management perspective at the shore, is the local shelter provided by the headlands at Ynys Moelfre and to the north of Traeth Bychan, in allowing limited sediment retention in the bays south of each headland.

At Moelfre, the village frontage is perched to the north end of the bay and is little more than a narrow storm beach. However the shelter provided by the rock to the north means that this area is only principally exposed to waves diffracted from the offshore. There is likely to be little significant movement of this beach, but it will attempt to roll back with sea level rise. At the southern end of the bay, at Porth yr Aber, the orientation of the cove in this area has meant that sediment is forced into the bay and the width created by the erosion of the soft clay infill has allowed a more sand/shingly beach to develop.

Traeth Bychan is indented further back from the main headlands. This additional width and the position of the amenity beach to the north and the more natural beach to the south have allowed these beaches to form as a backshore feature connected as a continuous profile to the larger expanse of intertidal foreshore making up Traeth Bychan. The small marina at Traeth Bychan appears to have taken advantage of an old quarry and this and the minor rock structure associated with the slipway have created a relatively stable area of beach and shingle ridge in the northern corner of the bay. As ever, the whole profile will attempt to roll back with sea level rise.

South of Penrhyn, through to the northern end of Benllech, the natural rock cliffs are slowly eroding, with the potential for local cliff falls. This frontage is seen as providing a sediment source, with a southerly drift.

From Benllech, south, the whole orientation of the coast changes to that exposed very directly to the net north east wave energy direction. The Benllech frontage is separated along the upper beach from Traeth-coch by the headland of Trwyn Dwlban, but remains connected through the lower foreshore and nearshore profile. This whole nearshore profile is anchored by the major headland to the east of Traeth-coch.

At Benllech it is primarily the upper beach behaviour that is significant in terms of shoreline management, and particularly at the northern end.

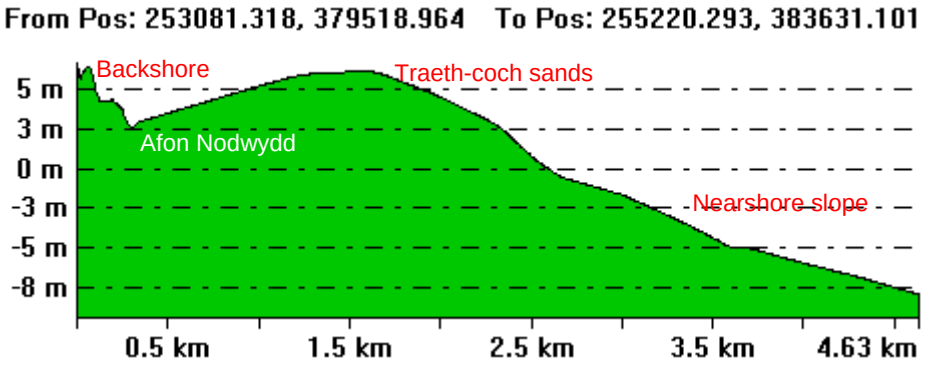
At the northern end, where the road runs down from the village, the shoreline is set back sufficiently that a very small shingle beach has been able to form. However, this area is, in effect, at the limit of the main frontage profile, where this main coastal slope abuts the rock shoreline to the north. The protection to the road to the south helps maintain the very limited shingle storm beach but, in being in a position to do so, this wall takes the full brunt of the wave action.

The southern end of the wall, despite the small areas of rock, is similarly exposed to the main wave attack and would tend to deflect waves into the beach area to the south. This wall is seen as having a significant local influence of the area.

South of the wall, the upper sandy pocket beach has been able to develop within the small valley but is constrained

from developing further back by the sea wall and car park behind. With sea level rise there is likely to be significant loss of this beach area.

Traeth- coch to the south of Trwyn Dwlban is seen primarily as a large infilled inlet with the estuary of the Afon Nodwydd only really influencing the area to the rear of the main open coast profile. This may be seen in the simple cross section taken from the backshore at the Nodwydd running seaward to the nearshore area.



It is only at along the northern flank to the bay, past Porthllondy and at the eastern end, as the nearshore profile merges into the massive rock headland, that there is any significant interaction between the back shoreline and the open coast.

At Porthllongdy, where the channel of the Nodwydd forces its way to the sea, waves are able to penetrate up the channel, tending to run along the frontage, with the shingle spit at Porthllongdy being indicative of the limit of significant way action. Locally, the various defences along this frontage may result in some scour and there is some overtopping, but overall the main processes will be the general distribution of sediments by interaction of the narrow channel and the massive intertidal sand banks.

At the head of the bay there is the opportunity for mud flats and some salting to develop in the shelter of the nearshore banks. These areas only being affected by more severe storms associated with higher water levels.

The shoreline to the east, along Llanddona Beach area, is more exposed but would be expected to be quite stable with the capacity for the shore to rebuild following local erosion by storms.

With sea level rise the whole seaward profile of Traeth-coch will try and readjust. There would be expected to be sufficient sediment within the open coast system for the sand flats to grow in line with sea level rise. With this growth and general slow setting back of the seaward profile, the area behind should tend to accrete. Along the Porthllongdy frontage and to the eastern end of the Llanddona Beach, there will be some increased pressure on the shoreline as the main central shoreline profile rolls back.

The eastern section of the zone is high hard rock cliff through to Trwyn Penmon and Ynys Seiriol. There area small beaches to the back of local bays.

Potential Baseline Erosion Rates

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. 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.

Location	NAI Base Rate (m/yr)	Notes	100yr. Erosion range (m)
Hard rock frontages in general	0.05	Some local areas may be subject to local landslipage but due to the very hard rock platform there is little anticipated increase in erosion rate due to sea level rise.	5 - 10
Portobello	0.2	General roll back with sea level rise	15 - 65
Traeth Lligwy	0.2	General roll back with sea level rise	15- 45
Moelfre	0.05	Crest erosion following failure of defences	20 - 35
Benllech	0.1	Crest erosion following failure of defences	10 - 45
Porthllongdy	0.05	Crest erosion following failure of defences	20 - 30
Afon Nodwydd	0	Erosion with sea level rise	20 - 30
Llanddona Beach	0.2	General roll back with sea level rise	15 - 45

While within local bays, sea level rise (SLR) will be a significant factor in future development of the shoreline, over much of the zone the very slow erosion of the main hard cliffs would be affected little. 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 re-activating landslides and slope instability.

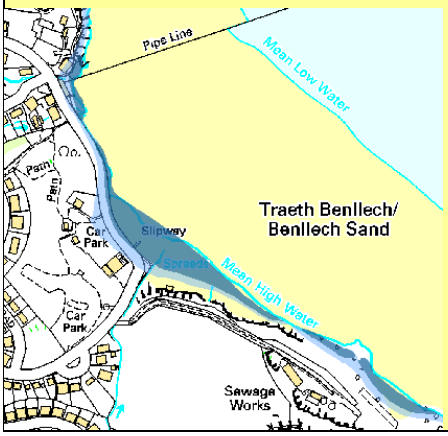
Flooding

Over the northern half of the zone there is at present only local areas of potential flood risk. These include areas of the Dulas Estuary and to the back of Traeth Lligwy. With sea level rise these same areas would be more regularly inundated over normal tides, but with only marginal increase in extent.

Sea Level Rise

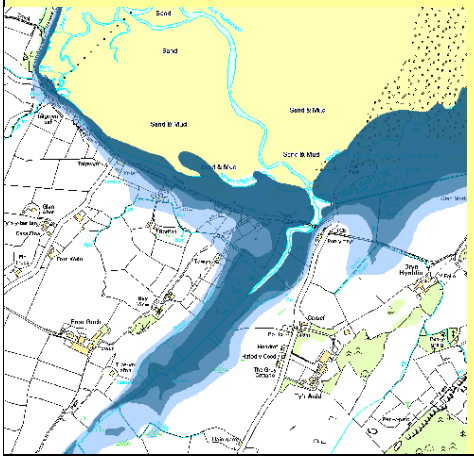
Under a 2m sea level rise scenario the most significant change in flood risk would be at the head of the Dulas estuary and along the valley of the Afon Goch. The adjacent plot shows a comparison of the projected MHWS levels under the 1m and 2m sea level rise scenario. Under the 2m scenario there could be normal tidal inundation of some properties and the road at City Dulas would be affected.

At Moelfre Traeth Bychan and Benllech, there is some flood risk on more extreme water levels, although the more significant flood risk is from overtopping. Even with a 1m sea level rise, direct risk is limited to extreme water levels. However, with increased water depth there is substantially greater risk from wave action. At Moelfre, increased water level would make the properties to the back of the road at the sea front very vulnerable to wave overtopping. Similarly at Benllech, overtopping of Beach Road, which is already an issue, would increase substantially, making the road potentially unusable with any significant wave action at high water. The properties at the northern end of Benllech would appear to be above MHWS even with 1m sea level rise, although there is increased direct flood risk on extreme water levels. This may require local investigation.

Sea Level Rise	
	Under a 2m sea level rise scenario there is the possibility of direct flooding under normal tidal levels to the properties at the north end of the Benllech frontage. The adjacent plot shows a comparison of MHWS flood extent for MHWS under the 1m and 2m water level scenarios. Under a 2m scenario the southern end of the road would be submerged on MHWS, highlighting not only this future risk but also the vulnerability of this corner to direct flooding and wave overtopping at present.

There is risk of flooding along the promenade at Porthllongdy with the increased risk in the future with sea level rise, both from direct flooding and wave overtopping. The Ship Inn and the properties adjacent to the Ship Inn are not predicted to be at direct risk, although in the future access to these properties and the public house would be at significant risk.

At the entrance to the Afon Nodwydd there is far more substantial risk than in other areas of the zone. Several of the properties to the west of the main entrance channel are already at risk on more extreme events and the access road is indicted to be at or close to MHWS tide level. With 1m sea level rise several properties would be at risk on normal tides and the access road to these properties and properties behind would be subject to normal high tide flooding.

Sea Level Rise	
	The adjacent plot shows a comparison between projected MHWS for the present day, the 1m scenario and 2m scenario. Under the 1m scenario the effective entrance would increase in width and under a 2m scenario there would be significantly greater flooding over much of the western frontage.

EXISTING DEFENCES

There are local defences at Portobello but no formal defence elsewhere within the Dulas Bay area. At Moelfre, there are defences to the road where in runs down from the higher ground, but over the main sea front the level of the road and the shingle storm beach provide the only defence.

At Traeth Bychan there are local defences at the back of the beach and to the property beside the slipway.

The main defence at Benllech is the sea wall to the road and this has a low crest wall providing some protection against over topping. The sea wall extends behind the car park and part way along behind the sand beach.

At Porthllongdy there are local defences to properties along the frontage and a sea wall with a low crest along the road to car park. Further south there is a low quay wall to the boat standing area at Croesfryn

In other areas behind Traeth-coch there is principally only a natural bank defence along sections of the frontage. There are low earth banks along the side of the valley at the entrance to the Afon Nodwydd.

UNCONSTRAINED SCENARIO

Only really at Benllech does the defence interact and prevent significant erosion of the shoreline. The frontage as a whole would erode and roll back as discussed earlier. Only at Benllech would erosion be significantly greater than is seen at present.

KEY INTERACTION WITH DEFENCES

As stated above the most significant interaction with the natural coastal processes is at Benllech. Where there areas of local defence at the crest of beaches, as the beaches attempt to roll back, the defences would resist such change and there is the likelihood that the beaches would steepen with loss of volume, amenity value and protection.

3 Management Scenarios

3.1 No Active Intervention – Baseline Scenario 1.

The key issues are identified for each individual area.

At Portobello as the defence deteriorates and as the beach rolls back so there would be risk to the property behind. There are no defences within Dulas Estuary and, with sea level rise, there would be increased risk of flooding to property. One significant area of change, under the sea level rise scenarios, would be the risk to the main road further up the valley. The lack of defences allows the coast to function naturally in support of the environmental designations.

There is some risk to individual properties in the longer term situated along the crest of the cliffs in this whole area.

At Traeth Lligwy, the occasional exposure of the underlying clay posed little risk to the area and is part of the natural readjustment of the beach. There have been attempts at beach management to replace sand over the clay for amenity purposes. The success of this is very dependent on local wave conditions. The erosion of the clay would allow infill with sand and would sustain the natural development of the bay. The Fish Weir is at risk as sea level rises.

Allowing the coast over the central cliffed frontage to erode, maintains the essential landscape of the area and the natural interaction with the designated foreshore and nearshore areas. It also contributes to sediment supply to the area.

At Moelfre, there is little significant pressure on the local defences at present. However, if the defences were allowed to deteriorate the road would be at risk. With sea level rise the beach would attempt to roll back and there would be increased risk of wave overtopping, which together with the long term risk of erosion, would result in loss of properties along the frontage. Although the specific damage to properties would be relatively low, the village would lose its traditional sea front and this would have an impact on the village as a whole.

At Traeth Bychan, there is no significant risk at present. In the future the beach would tend to roll back and, with that, there would be the loss of parts of the car park, local properties, as well as access to the marina. This would impact on the amenity and tourism value of the area.

As the sea wall at Benllech deteriorates it would eventually fail, potentially not until epoch 2. There would be the loss of the road and the cliffs behind would be subject to future erosion. The properties at the north end of the road would be lost in the longer term. This, if unmanaged, would have a significant impact on access through the village, although there would be alternative access to all properties. Potentially more significantly, the main access to the beach would be lost, together with the main sea front car park and facilities. The loss of the wall in front of the car park would, however, create additional width at the backshore and would provide opportunity for the upper drying beach to be maintained. This could be a significant benefit to the amenity and tourism of the area.

At Porthllongdy, there would be gradual loss of the various sea walls and eventually loss of properties due to slow erosion. The main access road and car park would be lost, as much due to flooding, as to erosion, as sea level rises. This would be a gradual process and significant losses would not occur until well into epoch 2 and beyond into epoch 3.

The main risks behind Traeth-coch are from flooding and effective erosion as the water level rises with sea level rise. There are a significant number of properties at risk in the future with potentially 31 properties at risk from normal tidal flood under the 2m sea level rise scenario. There would be further properties along the frontage where the access would be tidal. Allowing flooding of the low lying land would help support saltmarsh growth and would be seen as being beneficial to the nature conservation of the area.

3.2 With Present Management – Baseline Scenario 2.

The table below sets out current policy and management approach for the Zone.

SMP 1 No.	Management Unit	Policy	Subsequent Management Approach
Anglesey			
4.1	Point Lynas to Portobello	DN	
4.2	Portobello to Ynys Moelfre	DN	Traeth Lligwy, beach management
4,3	Ynys Moelfre to Huslan	DN	
4.3a	Traeth Bychan	DN	
4.4	Benllech	DN/HTL	
4.5	Trwyn Dwlban to Croesfyn	DN/HTL	

SMP 1 No.	Management Unit	Policy	Subsequent Management Approach
4.6	Croesfyn to Llandonna Beach	DN/HTL	
4.7	Llandonna beach to Trwyn Penmon	DN	
4.8	Puffin Island	DN	

The North West Wales Catchment Flood Management Draft Plan does not go into great detail for this area. The area is covered by one policy unit covering the whole of Anglesey and the policy assessment is summarised below.

Policy unit 1 Anglesey	This unit covers Anglesey including all the river catchments draining the island. Mostly rural catchment consisting of the Anglesey AONB and the towns of Llangefni Holyhead and Amlwch.
Problem/risk:	**Physical characteristics:** People, property and infrastructure in a number of small towns and villages. There are several scattered small villages and settlements situated upon gently undulating and low-lying land. Apart from the far south east corner where, slightly steeper land can be found. Predominantly moderate quality grade 3-4 agricultural land. The northern part of the island consists mainly of poorly draining seasonally waterlogged soils. The entire policy unit is an Environmentally Sensitive Area with much of the coastline designated an Area of Outstanding Natural Beauty.
	Flood mechanism: Sewer flooding. Surface water flooding. Small localised river flooding as the river channel quickly fill and spill out over the banks. This usually occurs after long periods of rainfall and occurs in Llangefni and several small villages (e.g. Amlwch, Menai Bridge, Beaumaris etc.). The flood depths in this policy unit are shallow and the flood extents in the rural areas can be relatively wide owing to the wide floodplains.
	Future flood risk summary (in 100 years time
	Climate change is unlikely to have a significant affect on the number of people and properties at risk of flooding in Anglesey. This is likely to be the case across most of the villages and settlements in Anglesey with only small increases in flood risk due to climate change. More people may be affected by increased surface water and sewer flooding. Wetter winters with more frequent and more severe storm events are expected to increase flow volumes. The broad scale modelling showed sea-level rise has very little effect on the flood risk in the policy unit.
	Policy 3 - Continue with existing or alternative actions to manage flood risk at the current level.
Policy selected	The current flood risk in this policy unit is from a combination of surface water flooding and localised river flooding. Sewer flooding also presents a flood risk. 1% of the population in the policy unit is at risk from a 1% AEP flood event. The number of people at risk only increases by 0.2% in the future as a result of climate change. The flood risk is considered tolerable and therefore a policy 5 is not justified. There are a number of villages and small settlements where current flood risk management actions are carried out (e.g. Llangefni, Amlwch,

	Beaumaris, Llanfairpwll etc.). Policy 3 is the obvious policy choice for this policy unit. This will support the existing flood risk management activities, maintaining a relatively low flood risk across the whole island. Policy 3 will allow alternative flood risk management activities to be explored to maintain the current level of flood risk. There is likely to be an increase in the number of flood events as a result of climate change. However this flooding is unlikely to significantly increase the risk to people or disrupt community life considerably. We will continue to maintain the river channels and local flood defences to sustain the same level of flood risk across the all the locations at risk. There may be opportunities in some places to work with land owners and the local authorities to provide alternative and more sustainable options, such as increasing the area of woodland to reduce run-off and therefore maintain the same level of flood risk. However, increasing the frequency of flooding to reduce flood risk over the whole policy unit, i.e. selecting policy 6, is unlikely to meet the objectives of ensuring the harm to life caused by flooding does not increase across the whole of Anglesey. Therefore policy 6 is not the most appreciate policy choice. Although climate change does increase flood damages slightly in the future the number of people at risk only increases by 1.2%. Therefore, a policy 4 is not required. Stopping or reducing the existing flood risk management actions would allow existing flood defences to fall into a state of disrepair and would increase the number of people and property in the policy unit at a greater risk of flooding. There are likely to be more than 1,200 people at risk if the current flood risk management actions were discontinued or reduced. This does not meet the policy unit objectives and therefore policies 1 and 2 are unsuitable
Justification and alternative policies considered	Opportunities: - Ensure no increase in run-off from the new developments proposed in the Wales Spatial Plan through development control. - Reduce future flood risk by influencing and informing the planning process. - Help meet national biodiversity action plan (BAP) targets through flood risk management activities. - To improve water level management, meeting the needs of flood risk management as well as enhancing wetland habitats through development of Water Level Management Plans (WLMPs). - To reduce flood risk and improve water quality by promoting and encouraging the appropriate use of SuDS in the proposed urban developments in the Wales Spatial Plan. - To improve the sustainability of flood risk management along the coastline and estuaries through influencing the second generation of Shoreline Management Plans. - Reduce flood risk throughout the CFMP area through initiatives and actions that will enhance the character of the landscape and increase amenity opportunities for recreation, tourism and leisure activities within the National Park and Areas of Outstanding Natural Beauty. - Reduce run-off from upper catchments through working with the Forestry Commission Wales and their Better Woodlands for Wales project. - Reduce peak discharge rates in rivers through restoration of watercourses to a good geomorphological river status (i.e. naturally functioning watercourse) in accordance with the Water Framework Directive. - Reduce flood risk through improved flood warning and emergency

	response. Constraints: - Government and international legislation, environmental management policies, plans and strategies for the catchment should be complied with, such as accommodating new hosing within the catchment as detailed in the Wales Spatial Plan and compliance with the Habitats Regulations. - Some environmentally designated habitats are susceptible to changes in flood frequency, flood water chemistry, groundwater levels and drainage system maintenance. - Visual impact of flood risk management activities within the, AONBs and ESAs. - Presence of protected species with specific water level, water quality and habitat requirements, such as great-crested newt and reed bunting - Large number of river catchments operating individually. - Historic development and some heritage designation present permanent physical obstructions in floodplains. - No degradation of existing fish passage and habitats. - Some exposed and subsurface archaeological sites in the floodplain are susceptible to changes in water level, flood frequency and water chemistry. - Tourism, leisure and recreation amenities are vital to the economy of the area.

In general terms the policy derived by the CFMP is similar in nature to the more local assessment provided by SMP 1, in that it is for continued local management of specific areas at risk. From the CFMP perspective, there is no significant increase in risk as a result of climate change. However, the CFMP specifically does not consider the direct increase in risk due to sea level rise, this being deferred to the SMP2.

Under this With Present Management scenario, the basic policies set out in the SMP 1, although originally developed over a 50 year period are taken forward as continued management over the 100 years of SMP2. The SMP 1 took an approach based more on the need for action more than that of defining a policy for management. As such, in some areas, where there was little pressure on defences over the next 50 years, the policy was for Do Nothing. Taking a longer term perspective, in some areas the policy then changed to Hold the Line as it was recognised that further defence might be required. Since in many areas there is little immediate pressure, over much of the frontage the policy was for No Active Intervention (or Do Nothing), because there was seen as being no need fro significant action. This is somewhat different from the SMP 2 perspective, where the focus is on a long term intent for management and, therefore, regardless of there being little need to intervene immediately, there might still be an intent to manage the frontage into the future. The focus of the discussion is on the local areas of management and where the SMP identifies a longer term policy of Hold the Line this is taken as being an intent for management from the present day. Even so much of the shoreline has a defined policy under SMP 1 for Do Nothing and would be the same as discussed above in management scenario 1. The key areas of difference are discussed below.

For the whole Duals Bay area the policy is fro Do Nothing as is the policy for Moelfre and Traeth Bychan.

At Benllech, the intent is to maintain the sea wall to the road. This is seen as sustainable at present really reflecting the short term policy of SMP 1 in saying Do Nothing. The more significant threat comes in the medium to long term. There would be increased overtopping towards the end of epoch 2 and the road wall would need to be maintained. Continuing defence of the sea wall would then require some raising or further reinforcing the defence, particularly to prevent the increasing interaction the waves along the frontage. As sea level rises so the area of beach at the southern end would tend to be lost. Maintaining the sea wall in the area of the car park would increase the likelihood of this reducing the amenity value of the area. To take purely a Hold the Line approach would be to accept this loss of amenity and accept the need for a higher crest wall to continue to maintain the function of the road. This policy of management would mean that effort was put in to sustain the car park, even though there is a future risk that this could be below the level of normal tides. This would not be seen as being sustainable in to the future.

Along the Porthllongdy frontage the SMP1 policy is for future management. The policy is principally focussed on the area of the car park and access road. As at Benllech, this is seen as being sustainable in the short to medium term but to present problems in the long term as defence moves to providing protection against normal tidal flooding of the area. As a long term policy this is not seen as being sustainable.

Around the entrance to the Afon Nodwydd, the initial SMP1 policy is for Do Nothing as there was seen to be limited immediate risk. In the longer term the policy changes to Hold the Line as the risk of flooding increases. As with the areas above, taking this forward over 100 years and in setting a course of action for the future, this would not seen as being realistic or sustainable. Increasing defences to address the long term flooding issues would establish a pattern where such defences would need to be increased further into the future, increasing the eventual vulnerability of the properties and land use. Such defence would also start to impact on the natural development of the area and may result in an inability fro proper development of the saltmarsh.

A comparison of the two baseline scenarios is provided below together with an evaluation of economic damages.

4 Summary Comparison and Assessment of Baseline scenarios.

Table 1 compares the economic damages that might arise under the two baseline scenarios. Table 2 provides a summary comparison in terms of the overall objectives based on the key issues identified in the introduction to this Coastal Area.

Erosion damages and those associated with flooding are identified separately in Table 1. The aim of this table is to demonstrate the potential economic damage that might arise from either flooding or erosion. As such properties that might be lost in the future due to erosion are not discounted from the assessment of flooding. Similarly, properties whose value may have been written off due to regular flood damage are still included within the assessment of erosion. Such an approach is clearly not strictly in line with normal economic appraisal at strategy or scheme level. It is however, considered appropriate at the higher level of the SMP assessment where the essential aim is in identifying potential different forms of risk in assessing different scenarios. Where this is felt to disproportionately distort the economic assessment then this is identified in appendix H and the economic case adjusted accordingly.

The assessment of economic damage is made using a simplified Modelling Decision Support Framework (MDSF). In the case of erosion, this GIS based tool takes the predicted erosion distance for any section of the coast based on the assessment of erosion by the end of each epoch. It is then taken that there would be a linear erosion rate between these timelines (e.g. a property located midway between the epoch 1 timeline (20 years) and that for epoch 2 (50 years) would be taken as being loss in 35 years). Each property is defined by a single point rather than by its full footprint. No account is taken in the assessment of loss of access or loss of services, although this is discussed in the text where critical. The MDSF method then draws information from a property data base, providing general information with respect to that property. The value of the property is discounted in terms of when that property may be lost.

In the case of flooding, the open coast water levels are assessed against threshold levels for individual properties based again on the property point source data base. No detailed modelling has been undertaken to assess flow paths and or possible increase in water levels dues to estuary processes. It is taken that, when a flood defence fails or is overtopped, the whole flood area behind a defence is open to flooding and that flooding would occur to the full extent of the potential flood plain, over a single high water period. Damages are assessed in relation to the depth of flooding that would occur based on the type of property identified in the data base. From this assessment of potential flood damage for any specific water level condition, annual average flood damages are determined during each epoch. An average annual average damage value is taken between the present (2010) and 50 years time (2060) and between 2060 and 2110. This average value is taken in determining an estimate of discounted Present Value (PV) Damages over the period of the SMP. This simplified approach allows consideration of flood risk under different sea level rise predictions for different scenarios.

Table 1. Economic Assessment

The following table provides a brief summary of erosion damages determined by the SMP2 MDSF analysis for the whole PDZ. 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)		
No Active Intervention	**No. of properties:**		**Value**	**No. of properties:**		**Value**	**No. of properties:**		**Value**	**No. of properties**		**PV Damages**
Location	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**(£x1000)**
Dulas Bay	0	0	0	2	0	204	2	2	816	2	4	216
Moelfre	0	0	0	2	0	184	7	2	967	16	3	179
Benllech	0	0	0	0	1	15	0	0	0	0	2	4
Porthllongdy	0	0	0	0	1	204	2	3	436	11	5	113
Croesfryn	0	0	0	2	0	332	2	1	536	5	1	198
Afon Nodwydd	0	0	0	0	0	0	2	1	500	4	1	35
Llanddona Beach	0	0	0	0	0	0	1	1	128	1	1	12
											Total for PDZ1	
With Present Management	**No. of properties**		**Value**	**No. of properties**		**Value**	**No. of properties**		**Value**	**No. of properties**		**PV Damages**
Location	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**x £k**	*Res.*	*Com.*	**(£x1000)**
Dulas Bay	0	0	0	2	0	204	2	2	816	2	4	216
Moelfre	0	0	0	2	0	184	7	2	967	16	3	179
Benllech	0	0	0	0	0	0	0	0	0	0	0	0
Porthllongdy	0	0	0	0	0	0	0	0	0	0	0	0
Croesfryn	0	0	0	2	0	332	2	1	536	5	1	198
Afon Nodwydd	0	0	0	0	0	0	2	1	500	4	1	35
Llanddona Beach	0	0	0	0	0	0	1	1	128	1	1	12
											Total for PDZ1	

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

Other information:

The following flood damages have been determined through use of MDSF. These figures are aimed to indicate the level and impact of flood risk rather than being a detailed economic appraisal. In many areas substantial numbers of properties would be liable to flooding on the more frequent events both under NAI and WPM, a nominal write off value has been allowed in the table for properties at frequent risk; this generally excludes values at risk at present on a 1:1 year event, in 50 years time for the 1:10 year event and in 100 year time the 1:50 year event.

ASSESSMENT OF POTENTIAL FLOOD RISK

	Flood risk tidal 2010			Flood risk tidal 2060			Flood risk tidal 2110			tidal risk 2m SLR		
No Active Intervention	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**No. of properties**		**PVD**
Location	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**(£x1000)**
other	0	2	0.39	0	3	0.60	0	4	5	4	0	29
Dulas	0	4	11	0	5	59	0	6	62	7	2	910
Moelfre	0	3	1	0	5	2	0	8	17	0	13	90
Traeth-coch	0	23	15	0	24	78	0	30	112	31	7	1289
											Total for PDZ19	2318

With Present Management	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**No. of properties**		**PVD**
Location	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**x £k**	<1:10 yr.	>1:10 yr	**(£x1000)**
other	0	2	0.23	0	3	0.33	0	4	2	0	4	12
Dulas	0	4	5	0	5	6	0	6	12	0	9	184
Moelfre	0	3	0.43	0	5	0.59	0	8	3	0	13	21
Traeth-coch	0	23	8	0	24	9	0	30	25	0	38	296
											Total for PDZ19	514

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.

STAKEHOLDER OBJECTIVE	NAI			WPM		
	Fails	Neutral	Acceptable	Fails	Neutral	Acceptable
Reduce risk to life						
Protect properties from flood and erosion loss						
Minimise the need for increasing effort and management of coastal defences						
Avoid reliance on defence particularly where there is a risk of catastrophic failure						
Maintain access to local centres, villages and isolated properties						
Maintain important local centres supporting the smaller communities						
Maintain recreational use of beaches and bays						
Maintain access to the coast including car parking and facilities						
Maintain access for boat use and associated water sport activity						
Maintain character and integrity of coastal communities						
Maintain agricultural value of rural community						
Identify risk and reduce risk of loss of heritage features where possible						
Maintain historic landscape						
Prevent disturbance or deterioration to historic sites and their setting						
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.						
Maintain or enhance the condition or integrity of the national (SSSI) designated sites and interest features within the context of a dynamic coastal system.						
Maintain and enhance educational and scientific understanding of geology and geomorphology						
Avoid damage to and enhance the natural landscape						
Maintain the human landscape and character of communities						

5 Discussion and Detailed Policy Development

The No Active Intervention scenario, applied over the whole coast, raises local issues in terms of managing risk to properties, and potentially life, but also in terms of the general built landscape and essential character of the various small communities, which underpin the overall amenity and tourism attraction to the area. While the underlying aim is to maintain the spectacular and natural landscape of the area, the distinctive value of this part of Ynys Mon is the aspect that this natural landscape is punctuated by the traditional small communities, providing valuable areas for residential use and coastal use. With Present Management aims to sustain this aspect of the coast but in the long term presents issues for sustainable management into the future. There is a clear need to allow and encourage adaptation, but sustain the overall important aspects of the coast there is in many local areas a need for continued management. While in many of these local areas the fundamental need for change comes in the longer term with accelerating sea level rise, it is in looking for how change can be managed over the short to medium term that will allow sustainable change in the future.

Over much of the coast a No Active intervention policy is both sensible and desirable. It is in the local are that the following discussion focuses.

Trwyn Cwmrwd to Ynys Moelfre.
The overarching policy for this area has to be for No Active intervention. This would include each of the main bays and the entrance to the Dulas Estuary. Under this policy at Lligwy, it is seen as important that the coast is allowed to function naturally. Beach management to address for amenity reasons the exposure of the clay foreshore may be important from time to time, but allowing the clay platform to erode is seen as being part of allowing this natural development, ensuring that the whole function of the bay and the foreshore creates space to retain overall a healthy beach and backshore. It has been identified that some access management would be beneficial in maintaining the integrity of the backshore area.

To the north of the estuary there is the small hamlet of Portobello. Here the beach is seen as being reasonably stable and the local defences behind are not seen as interacting with this. While it is not considered an area where there would be public investment neither is an area where continued management of the existing defences would have significant impact. This could change with sea level rise and to enable the estuary to develop naturally in the future the long term intent would be for No Active Intervention. With this very specific intent to encourage future natural function of the frontage the policy for the area changes from Managed Realignment to a Policy of No Active Intervention. This would not preclude maintenance of private defences but with the intent that improvement or strengthening of such works would need to demonstrate that there would be no impact on the intent of manage the adjacent sections of coast to allow their natural evolution..

Within the Dulas Estuary (Traeth Dulas), to allow the estuary to adapt to future change in sea level, while supporting the nature conservation values but to provide the opportunity for natural warping up of the head of the estuary to continue to provide a degree of protection to land around the estuary shoreline, the policy has to be No Active Intervention. Even with the natural defence that could be developed, there would be future risk to properties and to the main road further upstream at City Dulas. This policy would not preclude consideration of local flood resilience measures in the future to mitigate such risk.

Ynys Moelfre to Penrhyn

The present policy at Moelfre for Do Nothing was developed very much on the basis that there was not seen as being a need for substantial increase in protection, rather than an intent to abandon management of the area. From the SMP 2 perspective, this would now be a policy, initially for Hold the Line. This might include maintain the existing road walls to sustain access to property and to the sea front. This low level of future management is seen as being sustainable probably through epoch 2. There would be increased difficulty to sustain defence to the whole area into and through epoch 3. With sea level rise, the management of flood risk, principally due to overtopping, would be far more difficult to sustain. Increasing the height of the defence at the back of the beach would only result in loss of the beach and increasing the future pressure for change. Even so, with accepting the possible long term loss of properties or loss of the car park and possibly loss of the road could create a pattern for defence that could be managed well into the future. This would need to be examined in more local detail and in association with the local community. The important issue being raised by the SMP 2 is that over the short to medium term, should there be a need to improve risk management this needs to be done in such a manner as to work towards long term adaption rather than in merely reinforcing the existing defence line. The policies therefore change both from that of SMP1 but also overtime. The policies would be for Hold the Line in epoch 1 and probably epoch 2 but with the intent to realign the defence and adapt the sea front in epoch 3. Associated with this would be an intent to allow local realignment of the coast to the north looking to sustain property generally set back behind the rock foreshore.

In the area of Traeth Bychan, where typically less formal defence and a more adaptive shoreline already, policy in the short term is for continued managed realignment and avoiding construction of hard linear defences. Typically this might not exclude reinforcing the protection to the slipway in such a manner that helps sustain the beach to the north and might help manage the main beach to the south. The overall intent would be to support the continued use of the frontage as at present but to avoid heavy reliance on defence. This may mean relocation of facilities and buildings and in the longer term relocation of parts of the car park. The policies would be for Managed Realignment, followed by No Active Intervention.

Benllech

The existing defence to the road is under significant pressure, but is also seen as an important defence at present. The risk is that even with improvement to the defence, preventing overtopping, particularly to the southern end is going to require significant investment and could lead to loss of the upper beach in the future. Over the first two epochs sustaining the wall should be feasible and justified. In the long term continuing to hold this line is going to be unsustainable in its current form.

The SMP highlights the conflicting issues in terms of management of the sea front. The SMP highlights the way in which the road wall influences the development of the beach to the south. Purely taking a Hold the Line approach to the frontage would mean raising the road wall and, as a consequence of this, together with the impact of sea level rise, would result in significant loss of the beach to the south as wave reflection off the sea wall increases.

The SMP highlights the need to consider how the whole frontage functions both in terms of physical processes and in terms of use of the area. Decisions in terms of sustainable use need to take account of the longer term pressures. The SMP supports an integrated approach to be taken to future defence and planning of long term use. Raising the wall

will have significant imoact on use of the area. At the same time it has been stated during consultation that beach must be retained. With anticipated sea level rise there will be a need for change in management and this must be thought through in terms of how future shoreline management helps to support the use of the area. Even so, with sea level rise, there is going to be the risk of increased overtopping affecting the road and causing the beach area to try and move landward.

The policy for the frontage is to Hold the Line in epoch 1 and probably epoch 2. In the long term there would need to be a detailed examination of management of the whole area with most probably the need for realignment. This might require setting back the defence to the car park, but may also mean looking to different forms of defence to the road wall itself. As at Moelfre, management of the Benllech frontage generally, even over the short to medium term needs to consider this future need for adaptation.

Traeth-coch

At Porthllongdy, the approach need to be similar to that at Moelfre and Benllech, in that defence of the existing area is seen as being manageable over the first two epochs but there is seen as being a need to adapt to increased water level in the future. This would need to be developed at the local level with the community. Over the harder cliffs to the north, the defence to private property would not be precluded but is unlikely to attract public funding and would be subject to normal approval processes. Similarly down towards Croesfryn, while there would be a policy for No Active Intervention, this might not preclude private works subject to normal approvals.

At the Afon Nodwydd, the proposed response to future sea level rise in SMP 1 for future defence of the area is not seen as being sustainable. The change in defence afforded to property, together with consideration of future access along this frontage will need to be managed and examined in local detail. The policy for the area would therefore be for Managed Realignment.

Further east there would be little overall justification for defence of the natural frontage. To start defending would result in the need for greater and greater intervention, with would be more difficult to sustain. It would also move toward and approach which would destroy one of the essential values of the area in maintaining the nature shoreline. As such the policy in this area would be for No Active Intervention.

6 Management Summary.

The intent of the plan over the open coast is to maintain the natural function and landscape of the area. Within this overall policy there would be the need for local management as discussed above. The zone is divided into thee Management Areas reflecting this. The policy for each Management Area is summarised in the tables below.

DULAS BAY: From Trwyn Cwmrwd to Ynys Moelfre.

Policy Unit		**Policy Plan**			
		2025	**2055**	**2105**	**Comment**
19.1	General	NAI	NAI	NAI	Overarching policy for whole area, with local policy as set out below
19.2	Portobello	MR	MR	NAI	Local private management subject to normal approvals.
19.3	Traeth Dulas	NAI	NAI	NAI	Allow natural development of the estuary
Key: HTL - Hold the Line, NAI – No Active Intervention MR – Managed Realignment					

MOELFRE: From Ynys Moelfre to Penrhyn.

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
19.4	Porth Lydan	MR	MR	MR	This would quite specially not exclude local works subject to normal approvals
19.5	Porth Moelfre	HTL	HTL	MR	Management of existing defences but with the intent for future change
19.6	Moelfre to Traeth Bychan	NAI	NAI	NAI	
19.7	Traeth Bychan Centre	MR	NAI	NAI	Local management towards allowing natural development of the beach
19.8	Traeth Bychan South	NAI	NAI	NAI	
Key: HTL - Hold the Line, NAI – No Active Intervention MR – Managed Realignment					

TRAETH COCH: From Penrhyn to Trwyn Penmon

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
19.9	Borth Wen Cliffs	NAI	NAI	NAI	
19.10	Benllech Beach Road	HTL	HTL	MR	Management of existing defences but with the intent for future change
19.11	Trwyn Dwlban	NAI	NAI	NAI	
19.12	Porthllongdy	HTL	HTL	MR	Management of existing defences but with the intent for future change
19.13	Croesfryn	NAI	NAI	NAI	
19.14	Afon Nodwydd	MR	MR	MR	Development of a local management plan
19.15	Llanddona Beach	NAI	NAI	NAI	
19.16	Trwyn Penmon Cliffs	NAI	NAI	NAI	
19.17	Puffin Island	NAI	NAI	NAI	
Key: HTL - Hold the Line, , NAI – No Active Intervention MR – Managed Realignment					

PDZ19
Management Area Statements

MA 56 Dulas Bay
Trwyn Cwmrwd to Ynys Moelfre

MA 57 Moelfre
Ynys Moelfre to Penrhyn

MA 58 Traeth Coch
Traeth Cymyran to Holyhead

Location reference:	**Dulas Bay**
Management Area reference:	**M.A. 56**
Policy Development Zone:	PDZ19

* 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 56 & 57
Management Area
Policy Unit
Policy Development Zone
Scheduled Monument
Holyhead
Bangor
Caernarfon
Dolgellau
Aberystwyth
Llangurig
Fishguard
Carmarthen
Swansea
N
PU18.18
PU18.13
Llaneilian
Fresh Water Bay
Porthygwichiaid
Penrhyn Glas
Porth yr Aber
PU19.1
Ynys Dulas
PU19.2
Dulas Bay
PU19.3
MA56
Nebo
Gadfa
Dulas
Llaneuddog
City Dulas
Traeth Lligwy
Lligwy Bay
PU19.4
PU19.5
PU19.6
PU19.7
PU19.8
Ynys Moelfre
Lifeboat Sta
Heritage Centre
MA57
Brynrefail
Rhôs Lligwy
Llanallgo
A5025
A5108
0 0.5 1 Kilometres
Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2010. All rights reserved. Ordnance Survey licence number 100026380
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
Exisitng Indicative EA Flood Zone 3
EA Flood Risk Zone 2 where under the SMP policy there would be increased probability of flooding
ROYAL HASKONING

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

INTENT OF THE PLAN:

The underpinning intent of the plan is to allow the natural development of the shoreline supporting the important landscape, nature conservation and amenity value of the area.

Locally, the plan would not preclude maintaining existing defences at Portobello but with the clear intent that any such works would need to demonstrate no adverse impact on the way in which the entrance to the Dulas Estuary behaves. Within the estuary there would be some flood risk to agricultural land and potentially in the long term flood risk extending up to City Dulas. The plan would not preclude local resilience measures.

At Traeth Lligwy, the plan for No Active Intervention would not preclude local amenity management but recognising that the erosion of the clay foreshore does create width within the system necessary for longer term sustaining of the dune system and beach.

KEY ISSUES/RISK AND UNCERTAINTY:

There are uncertainties in terms of timing of impacts. It will be important to relate this to national monitoring of sea level rise and more general climate change.

ACTIONS:

ACTION	PARTNERS	
Shoreline monitoring	**Ynys Mon Council**	
Assess in detail potential impact on historic environment		
Plan for access management	**Ynys Mon Council**	
Examine opportunity for habitat enhancement and creation.	**EA**	**CCW**

DELIVERY OF THE PLAN

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
19.1	General	NAI	NAI	NAI	Overarching policy for whole area.
19.2	Portobello	MR	MR	NAI	Local private management subject to normal approvals.
19.3	Traeth Dulas	NAI	NAI	NAI	Allow natural development of the estuary.
Key: HTL - Hold the Line, NAI – No Active Intervention MR – Managed Realignment					

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Support local adaptation.
Medium term	Support local adaptation.
Long term	Support local adaptation.

IMPLICATIONS OF THE PLAN

CHANGES FROM PRESENT MANAGEMENT

No substantial change.

ECONOMIC SUMMARY

Economics (£k PV)	by 2025	by 2055	by 2105	Total £k PV
NAI Damages	146.0	502.3	506.5	1,154.8
Preferred Plan Damages	70.5	170.1	327.8	568.4
Benefits	75.5	332.2	178.8	586.4
Costs	0.0	0.0	0.0	0.0

FLOOD AND EROSION RISK MANAGMENT

POTENTIAL LOSS

There is potential loss of 6 properties and possible increased flood risk with sea level rise.

BENEFITS OF THE PLAN

The plan provides a longer term sustainable approach to management supporting the important natural qualities of the area. Through local resilience measures flood risk could be reduced to some 6 properties.

SUMMARY OF STRATEGIC ENVIRONMENTAL ASSESSMENT (INCLUDING HRA)

PDZ 19				
SEA Objective	**Impact of Preferred Policy for each Epoch**			
	1	**2**	**3**	**Mitigation**
Policy Units 19.1 to 19.17				
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).				
To avoid adverse impacts on, conserve and where practical enhance the designated interest of nationally designated nature conservation sites. Maintain/achieve favourable condition.				
To avoid adverse impacts on, conserve and where practical enhance national and local BAP habitats.				Habitat creation
To support natural processes and maintain geological exposures throughout nationally designated geological sites.				
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.				Appropriate design
To minimise coastal flood and erosion risk to scheduled and other internationally and nationally important cultural heritage assets, sites and their setting.				Excavation and recording
To minimise the impact of policies on marine operations and activities.				
To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services.				
To minimise coastal flood and erosion risk to agricultural land and horticultural activities.				
To minimise coastal flood and erosion risk to people and residential property.				
To minimise coastal flood and erosion risk to key community, recreational and amenity facilities.				
To minimise coastal flood and erosion risk to industrial, commercial, economic and tourism assets and activities.				

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

The SMP policy in this PDZ provides a range of policies along the coastline including NAI, HTL and MR. PDZ 19 includes interest features of the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC, and the Ynys Seiriol / Puffin Island SPA

Implications for the integrity of the site:
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC: no adverse effect on the integrity of the SAC.

Ynys Seiriol / Puffin Island SPA: no adverse effect on the integrity of the SPA.

SUMMARY CONCLUSION FROM THE WATER FRAMEWORK ASSESSMENT

Water body (and relevant PDZ)	**Environmental Objectives met?**				**WFD Summary Statement required?**	**Achievement of Any South East RBMP Mitigation Measures?**	**Details on how the specific South East RBMP Mitigation Measures have been attained** (dark green = achieved; light green = partly achieved & red = not achieved)
	WFD 1	**WFD2**	**WFD3**	**WFD4**			
Anglesey North (Coastal) (PDZs part 18 and 19) (MAN 54, 55, 56, 57 and 58)	N/A	**x** (PDZ 18)	**x** (PDZ 18)	**x** (PDZ 18)	**Yes** – Environmental Objectives WFD2, 3 and 4 may not be met because of the SMP policy in PDZ18 (MAN 55).	There were no relevant measures to the SMP2 for this water body.	N/A

Location reference:	**Moelfre**
Management Area reference:	**M.A. 57**
Policy Development Zone:	PDZ19

* 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 56 & 57

Management Area
Policy Unit
Policy Development Zone
Scheduled Monument

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

- Exisitng Indicative EA Flood Zone 3
- EA Flood Risk Zone 2 where under the SMP policy there would be increased probability of flooding

ROYAL HASKONING

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SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

INTENT OF THE PLAN:

The underpinning intent of the plan is to allow the natural development of the shoreline. There are local management issues at Moelfre and Traeth Bychan.

In relation to Moelfre, the intent of the plan would be to maintain use of the important seafront area but recognising that with sea level rise there may need to be some realignment, within epoch 3, which could result in loss of property and the road. This would need to be developed with the community, with the aim to increase resilience against overtopping and to allow development of the beach. Along the shoreline to the north there would continue to be slow erosion of the rock cliffs. The plan would not exclude local defence in keeping with the natural value of the frontage. This would be subject to normal approvals but with the intent to support the RNLI Lifeboat Station.

Traeth Bychan is an important amenity resource. There is scope here for local management to support this uses and maintenance of the beach area. Even so in the long term there would be need for some relocation of facilities. Local management would not have a broader impact on the adjacent coast.

KEY ISSUES/RISK AND UNCERTAINTY:

There are uncertainties in terms of timing of the proposed changes. There is a need for a detailed planned response to change. It will be important to relate this to national monitoring of sea level rise and more general climate change.

Defence at both Moelfre and Traeth Bychan is likely to require collaborative funding to sustain the amenity values of the area.

ACTIONS:

ACTION	PARTNERS
Local shoreline monitoring	**Ynys Mon Council**
Adaption planning ▪ Moelfre ▪ Traeth Bychan	**Ynys Mon Council** **Communities** **Highways**
Assess in detail potential impact on historic environment	
Plan relocation of coastal path	**PNP**

DELIVERY OF THE PLAN

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
19.4	Porth Lydan	MR	MR	MR	This would quite specifically not exclude local works, subject to normal approvals.
19.5	Porth Moelfre	HTL	HTL	MR	Management of existing defences but with the intent for future change.
19.6	Moelfre to Traeth Bychan	NAI	NAI	NAI	
19.7	Traeth Bychan Centre	MR	NAI	NAI	Local management towards allowing natural development of the beach.
19.8	Traeth Bychan South	NAI	NAI	NAI	
Key: HTL - Hold the Line, NAI – No Active Intervention MR – Managed Realignment					

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain existing defences. 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

The policy at Moelfre changes from No Active intervention to Hold the Line over the short to medium term.

ECONOMIC SUMMARY

Economics (£k PV)	by 2025	by 2055	by 2105	Total £k PV
NAI Damages	11.9	77.6	179.9	269.4
Preferred Plan Damages	5.4	5.7	129.0	140.1
Benefits	6.5	71.9	50.9	129.3
Costs	0.0	24.0	8.5	32.6

FLOOD AND EROSION RISK MANAGMENT

POTENTIAL LOSS

There is could be loss of some 9 property in area.

BENEFITS OF THE PLAN

The plan provides a longer term sustainable approach to defence, allowing adaptation core community and amenity areas. Through the plan some 11 properties would be sustained over a longer period of time. There would be reduced flood risk to some 5 properties.

SUMMARY OF STRATEGIC ENVIRONMENTAL ASSESSMENT (INCLUDING HRA)

PDZ 19				
SEA Objective	**Impact of Preferred Policy for each Epoch**			
	1	**2**	**3**	**Mitigation**
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To avoid adverse impacts on, conserve and where practical enhance national and local BAP habitats.				Habitat creation
To support natural processes and maintain geological exposures throughout nationally designated geological sites.				
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.				Appropriate design
To minimise coastal flood and erosion risk to scheduled and other internationally and nationally important cultural heritage assets, sites and their setting.				Excavation and recording
To minimise the impact of policies on marine operations and activities.				
To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services.				
To minimise coastal flood and erosion risk to agricultural land and horticultural activities.				
To minimise coastal flood and erosion risk to people and residential property.				
To minimise coastal flood and erosion risk to key community, recreational and amenity facilities.				
To minimise coastal flood and erosion risk to industrial, commercial, economic and tourism assets and activities.				

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.

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Implications for the integrity of the site:
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC: no adverse effect on the integrity of the SAC.

Ynys Seiriol / Puffin Island SPA: no adverse effect on the integrity of the SPA.

SUMMARY CONCLUSION FROM THE WATER FRAMEWORK ASSESSMENT

Water body (and relevant PDZ)	**Environmental Objectives met?**				**WFD Summary Statement required?**	**Achievement of Any South East RBMP Mitigation Measures?**	**Details on how the specific South East RBMP Mitigation Measures have been attained** (dark green = achieved; light green = partly achieved & red = not achieved)
	WFD 1	**WFD2**	**WFD3**	**WFD4**			
Anglesey North (Coastal) (PDZs part 18 and 19) (MAN 54, 55, 56, 57 and 58)	N/A	**x** (PDZ 18)	**x** (PDZ 18)	**x** (PDZ 18)	**Yes** – Environmental Objectives WFD2, 3 and 4 may not be met because of the SMP policy in PDZ18 (MAN 55).	There were no relevant measures to the SMP2 for this water body.	N/A

Location reference:	**Traeth Coch**
Management Area reference:	**M.A. 58**
Policy Development Zone:	PDZ19

* 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.

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- 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.

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Flood Risk Zones

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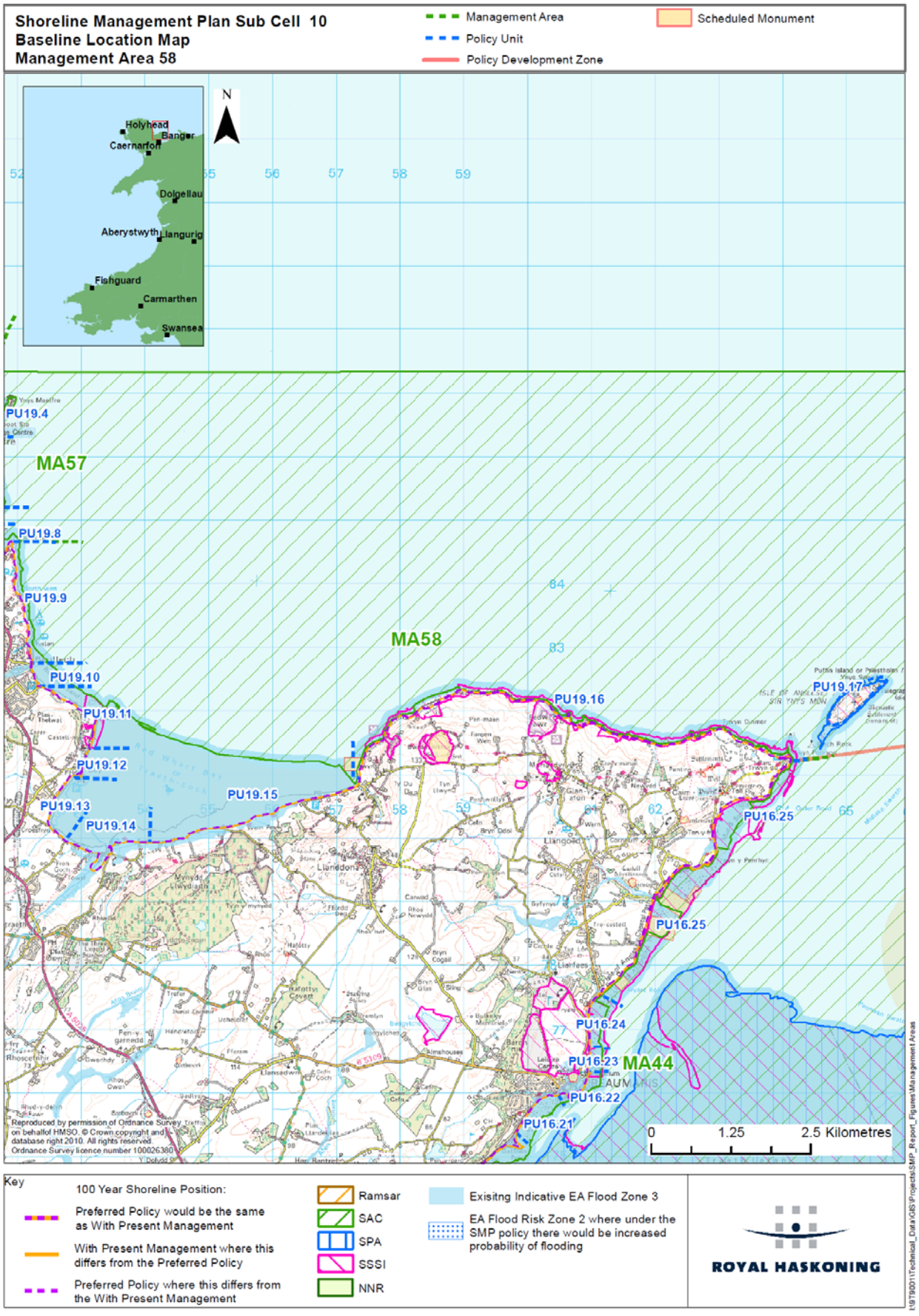
Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.

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 58
Management Area
Policy Unit
Policy Development Zone
Scheduled Monument
N
Holyhead
Bangor
Caernarfon
Dolgellau
Aberystwyth
Llanguric
Fishguard
Carmarthen
Swansea
MA57
MA58
MA44
PU19.4
PU19.8
PU19.9
PU19.10
PU19.11
PU19.12
PU19.13
PU19.14
PU19.15
PU19.16
PU19.17
PU16.25
PU16.24
PU16.23
PU16.22
PU16.21
0
1.25
2.5 Kilometres
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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
Exisitng Indicative EA Flood Zone 3
EA Flood Risk Zone 2 where under the SMP policy there would be increased probability of flooding
ROYAL HASKONING
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SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

INTENT OF THE PLAN:

The main areas of concern are indentified at Benllech, the northern frontage to Traeth Coch and the flood risk areas around the Afon Nodwydd.

At Benllech, the intent of the plan would be to sustain the road and maintain the important beach area. This is likely to be manageable over the short to medium term but the intent within the plan would be to consider realignment in epoch 3, specifically towards the southern end of the road. The approach to defence may also need to change in reducing wave overtopping and avoiding the need for excessive raising of the sea wall. Protection to adjacent property at the northern end of the road would need to be considered with respect to main aim to sustain the road.

Along the Porthllongdy frontage the intent within the plan would be to maintain defence over epochs 1 and 2 but for some realignment in epoch 3 to develop a more sustainable management of access and use of the area. The plan would not preclude local private defence to the north of the main access subject to normal approvals.

In other areas, both between Benllech and Traeth Coch and around the back of the Traeth Coch inlet, the intent would be to allow natural development of the shoreline with No Active Intervention. At the Afon Nodwydd, the intent would be to continue to manage the area but accepting a greater degree of flood risk and reduce reliance on increased levels of flood defences. This would need to be examined in detail in discussion with the local community.

To the southern part of Traeth Coch and through to Trwyn Penmon the plan would be for No Active intervention.

KEY ISSUES/RISK AND UNCERTAINTY:

There are uncertainties in terms of timing of the proposed changes. 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 more general climate change.

Detailed management and adaptation plans would need to be developed fro Benllech, Porthllongdy and the Afon Nodwydd, alongside support for adaption in other areas. Even where the policy is initially for hold the Line, actions taken need to consider and be undertaken with a view to future change.

ACTIONS:

ACTION	PARTNERS
Shoreline monitoring	**Ynys Mon Council**
Adaption planning ▪ Benllech. ▪ Porthllongdy ▪ Afon Nodwydd	**Ynys Mon Council** **Communities** **Highways** **EA**
Assess in detail potential impact on historic environment	
Examine potential for habitat creation	**EA** **CCW**

DELIVERY OF THE PLAN

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
19.9	Borth Wen Cliffs	NAI	NAI	NAI	
19.10	Benllech Beach Road	HTL	HTL	MR	Management of existing defences but with the intent for future change.
19.11	Trwyn Dwlban	NAI	NAI	NAI	
19.12	Porthllongdy	HTL	HTL	MR	Management of existing defences but with the intent for future change.
19.13	Croesfryn	NAI	NAI	NAI	
19.14	Afon Nodwydd	MR	MR	MR	Development of a local management plan.
19.15	Llanddona Beach	NAI	NAI	NAI	
19.16	Trwyn Penmon Cliffs	NAI	NAI	NAI	
19.17	Puffin Island	NAI	NAI	NAI	
Key: HTL - Hold the Line, , NAI – No Active Intervention MR – Managed Realignment					

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain existing defences. Develop adaptation planning and realignment approach.
Medium term	Maintain defences while moving towards adaptive management.
Long term	Implement community based adaptation.

IMPLICATIONS OF THE PLAN

CHANGES FROM PRESENT MANAGEMENT

No substantial change but more specific detail of adaptation.

ECONOMIC SUMMARY

Economics (£k PV)	by 2025	by 2055	by 2105	Total £k PV
NAI Damages	181.4	727.4	742.3	1,651.1
Preferred Plan Damages	96.3	339.1	452.4	887.8
Benefits	85.1	388.3	289.9	763.3
Costs	0.0	333.5	129.4	462.9

FLOOD AND EROSION RISK MANAGMENT

POTENTIAL LOSS

There is the potential loss of 9 properties in the area and continued residual flood risk.

BENEFITS OF THE PLAN

The plan provides a longer term sustainable approach to defence, maintaining defence to the core community areas and access. Under the plan some 16 properties would benefit from reduced risk due to erosion. The flood risk to some 30 properties would continue to be managed.

SUMMARY OF STRATEGIC ENVIRONMENTAL ASSESSMENT (INCLUDING HRA)

PDZ 19				
SEA Objective	**Impact of Preferred Policy for each Epoch**			
	1	**2**	**3**	**Mitigation**
Policy Units 19.1 to 19.17				
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).				
To avoid adverse impacts on, conserve and where practical enhance the designated interest of nationally designated nature conservation sites. Maintain/achieve favourable condition.				
To avoid adverse impacts on, conserve and where practical enhance national and local BAP habitats.				Habitat creation
To support natural processes and maintain geological exposures throughout nationally designated geological sites.				
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.				Appropriate design
To minimise coastal flood and erosion risk to scheduled and other internationally and nationally important cultural heritage assets, sites and their setting.				Excavation and recording
To minimise the impact of policies on marine operations and activities.				
To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services.				
To minimise coastal flood and erosion risk to agricultural land and horticultural activities.				
To minimise coastal flood and erosion risk to people and residential property.				
To minimise coastal flood and erosion risk to key community, recreational and amenity facilities.				
To minimise coastal flood and erosion risk to industrial, commercial, economic and tourism assets and activities.				

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

The SMP policy in this PDZ provides a range of policies along the coastline including NAI, HTL and MR. PDZ 19 includes interest features of the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC, and the Ynys Seiriol / Puffin Island SPA

Implications for the integrity of the site:
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC: no adverse effect on the integrity of the SAC.

Ynys Seiriol / Puffin Island SPA: no adverse effect on the integrity of the SPA.

SUMMARY CONCLUSION FROM THE WATER FRAMEWORK ASSESSMENT

Water body (and relevant PDZ)	**Environmental Objectives met?**				**WFD Summary Statement required?**	**Achievement of Any South East RBMP Mitigation Measures?**	**Details on how the specific South East RBMP Mitigation Measures have been attained** (dark green = achieved; light green = partly achieved & red = not achieved)
	WFD 1	**WFD2**	**WFD3**	**WFD4**			
Anglesey North (Coastal) (PDZs part 18 and 19) (MAN 54, 55, 56, 57 and 58)	N/A	**x** (PDZ 18)	**x** (PDZ 18)	**x** (PDZ 18)	**Yes** – Environmental Objectives WFD2, 3 and 4 may not be met because of the SMP policy in PDZ18 (MAN 55).	There were no relevant measures to the SMP2 for this water body.	N/A