



West of Wales Shoreline Management Plan 2

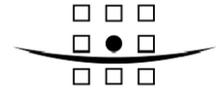
Section 4. Coastal Area G

November 2011

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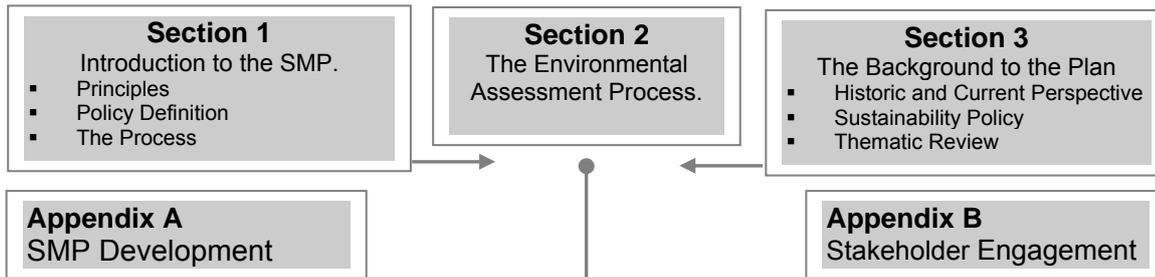
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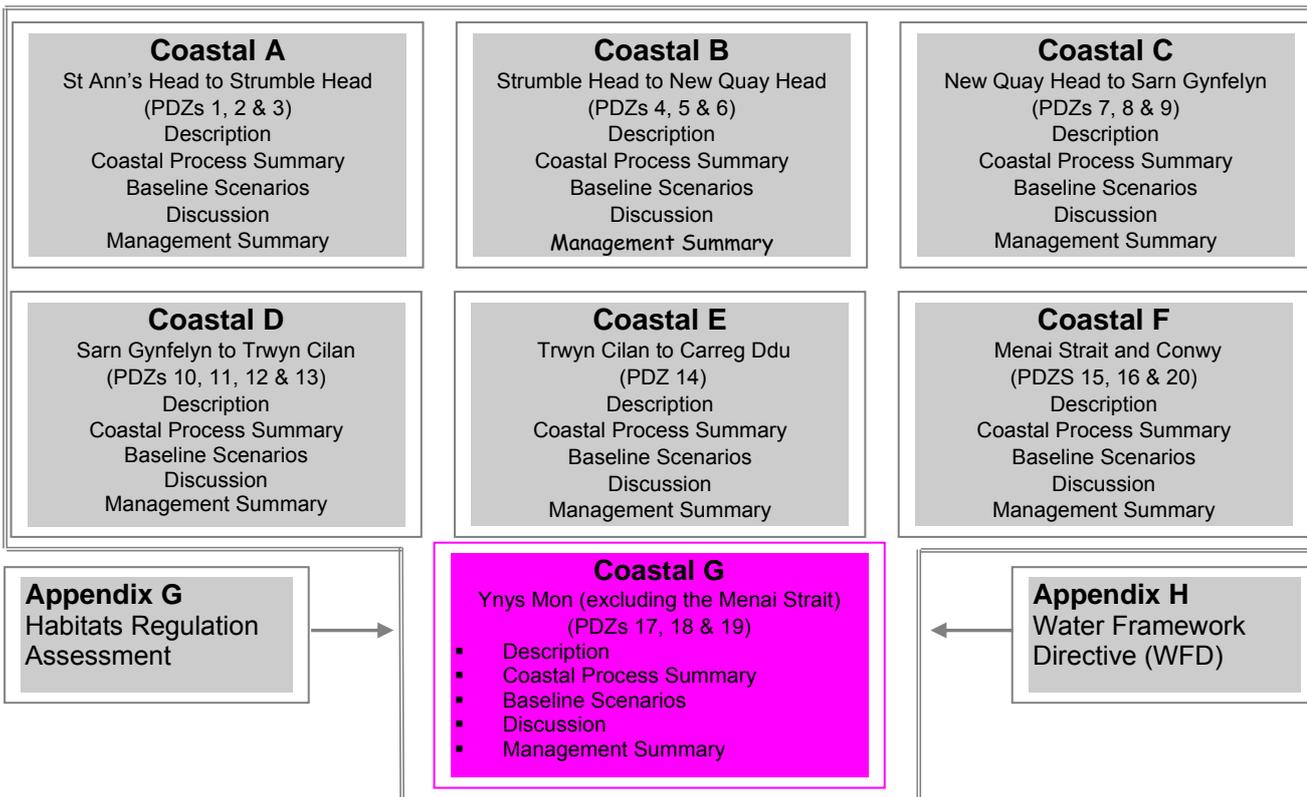
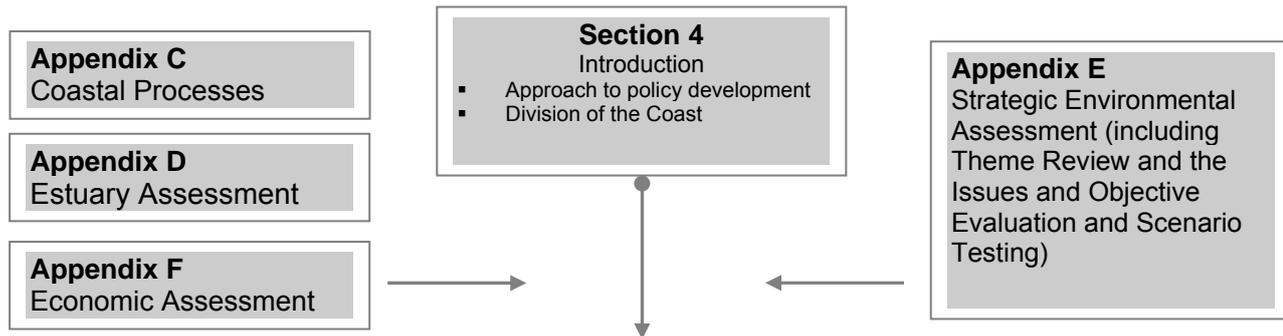
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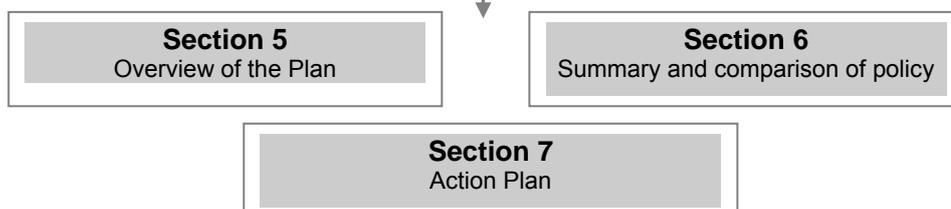
INTRODUCTION AND PROCESS



PLAN AND POLICY DEVELOPMENT



OVERVIEW



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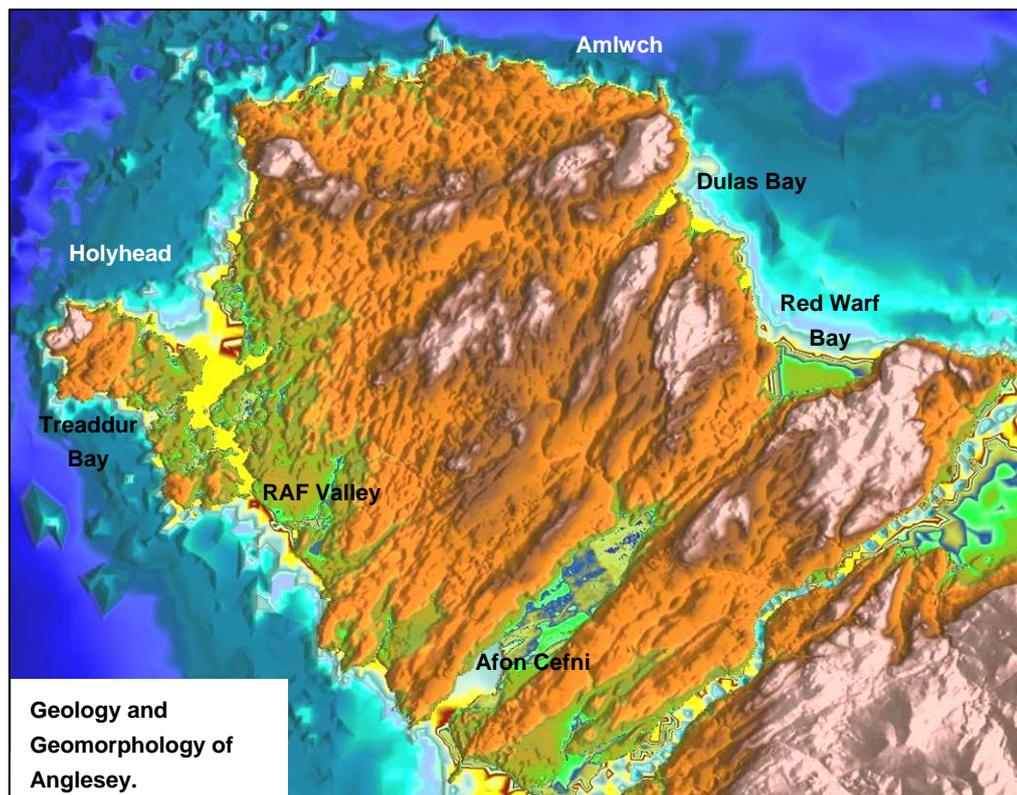
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4G.1 GENERAL DESCRIPTION

1.1 Character

*(Further detail for the area is covered in Appendix *** with individual features of the coast identified in the features and issues tables.)*

This coastal area is varied in its character owing to the differences in orientation and geology. There are significant areas of rocky coastline, but also extensive soft frontages, predominantly associated with the estuaries. The geology is exceptionally diverse and contains examples from most of the major geological eras. The geological structure of the island is comprised of bands of rock that are orientated northeast-southwest, and this has led to the distribution of differing coastal geomorphologies. The western side of the island, south of Holy Island, is comprised of a combination of the hard rock cliffs surrounding the estuary of the Afon Ffraw and significant areas of sand dunes in the Afon Ffraw estuary, with further dune systems around Rhosneigr and RAF Valley. Holy Island is characterised by hard rock cliffs on the seaward facing frontages interspersed with small sandy bays. Between Holy Island and the main land is the Inland Sea. This is controlled at its northern end by the Stanley Embankment and opens at its southern end to Cymyran Bay and the low coastline at Valley. To the north of the Stanley Embankment the distance between the Ynys Mon mainland and Holy Island widens with the muddy sandy bay of Traeth y Gribin. The eastern mainland coast comprises mainly sections of dune and clay cliff and is cut by the Afon Alaw estuary. The frontage, as with much of the softer sections of coast around Ynys Mon, is interspersed by local hard rock outcrops of the underlying geology. The northern section of Ynys Mon returns to hard rock cliffs with sporadic sandy bays. Traeth Dulas, Traeth, Lligwy, Traeth Benllech and Traeth Coch are the significant bays on the eastern side of Anglesey, with the remainder of the coast being formed of hard rock cliffs. These bays are the result of siltation of the mouth of several drowned river valleys.



The most significant town in this Coastal Area is Holyhead. This is an important hub supporting the surrounding area, as well as being a nationally important transport link to Ireland. Other important centres are Rhosneigr, Trearddur, Amlwch and Benllech that are primarily important as tourism destinations. The main transport network comprise the A5 and A55 that run east west across the centre of the Island from the mainland to Holyhead, and the two main coastal roads, the A5025 and A4080 that serve the north and south of the island respectively. Other significant roads serving the coast are the B4545 on Holy Island linking to Trearddur and providing an alternative access from Anglesey. It is noticeable that for large sections of the coast there is no access from the major roads, only minor roads that tend to branch off the A-roads towards specific locations. There are key local areas where there the main transport network is at potential risk, notably at Trecastell, Valley and Bull Bay, with more minor transport links potentially affected along the western coast of Holy Island and within the towns at Cemaes, Moelfre and Benllech. This minor road network is an essential aspect sustaining the very scattered small communities that are so much part of the character of the area.

This highly rural feature of scattered communities set within the high value landscape, especially at the coast, is a major attraction in terms of the quality of residential properties and in terms of tourism. Tourism is a significant contributor to the area's economic vitality, with the numerous beaches attracting and supporting this. Towns such as Rhosneigr, Trearddur, Cemaes, Bull Bay, Moelfre and Benllech all rely on tourism for both employment and in supporting community services. RAF Valley on the western side of the island has significant importance as a military asset and important for employment. Wylfa Nuclear Power Station located on the northern coast to the west of Cemaes is one of only two in the whole of Wales and has national importance as well being a significant employer for the region.

Much of the coast is recognised for its natural landscape and environmental value through international designations. The Aberffraw Dunes are designated a SAC along with the eastern coastline south of Moelfre that forms part of the Menai Strait and Colwyn Bay SAC. The coast of Holy Island, Cemlyn Bay and Ynys Feurig are designated as SPAs. There are also numerous SSSIs spread around the coast.

There are three heritage coast sections on the Island; Aberffraw Bay, Holyhead Mountain and the North Anglesey Coast, and numerous SAMs are located along the whole of this coastline. The port of Amlwch is designated a landscape of outstanding historic interest due to its past involvement in the mining of the Parys Mountain. There are clusters of listed buildings in Holyhead and Amlwch, with a sporadic distribution across the rest of the coast.

1.2 Physical Process Overview

(Further detail on coastal processes and geomorphology is provided in Appendix C).

Processes.

EXPOSURE

Water levels: There is quite considerable variation in tidal range between the western and eastern side of the island. Ynys Llanddwyn experiences a range of 4.2m while Trwyn Dinmor has a range of 6.6m. The Extreme Water Levels also show an increase from west to east for the 1 in 10 year event and 1 in 200 year event of 1.74m and 1.90m respectively.

Location	Tide m. AOD				Extreme Levels (return period) m AOD			
	MLWS	MLWN	MHWN	MHWS	10 yr	50 yr	100 yr	200 yr
Ynys Llanddwyn	-2.09	-0.89	1.11	2.11				
Porth Tre Castell	-2.10	-0.80	1.00	2.20	3.19	3.40	3.53	3.66
Trearddur Bay	-2.10	-0.90	1.10	2.30				
Holyhead	-2.35	-1.05	1.35	2.55	3.61	3.84	3.99	4.14
Cemaes Bay	-2.80	-1.30	1.50	3.00				
Amlwch	-3.00	-1.40	1.80	3.30	4.59	4.87	5.05	5.22
Moelfre	-3.10	-1.50	1.80	3.50				
Trwyn Dinmor	-3.10	-1.50	1.90	3.50				
Beaumaris	-3.20	-1.50	2.00	3.60	4.93	5.21	5.38	5.56

Waves: The wave exposure across this coastal area varies significantly due to the differing orientation of the coastline. The dominant offshore wave direction from south-southwest and southwest for western Anglesey. The exposure to these waves on the western coastline increases towards Holy Island with decreasing amounts of shelter provided by the Llŷn Peninsula. On the northern coast the waves become predominantly westerly, with contributions between northwest and southwest. The eastern side of the Island is exposed to local wind generated waves from the north and northeast as it is sheltered from the larger swell generated waves from the west.

GEOMORPHOLOGY:

The coastal area predominantly consists of hard rock cliffs with pocket sandy bays. There are, within the larger estuaries or larger sheltered inlets areas of clay cliffs. The main areas of continuous hard rock coastline are Holy Island and the northern coast. On the east and west coast the cliffs form the hard control points between the softer features.

The distribution of the softer geomorphology is the result of the varied geology of the island and the differing exposure to the dominant wave directions. The western coast is characterised by sand dunes, whereas the east has more extensive sandy bays. The Aberffraw dune system is the result of deposition with the Afon Ffraw estuary following its drowning after the last glaciation. At Rhosneigr and fronting RAF Valley dunes have also developed on the softer lithologies and low lying topography.

The Inland Sea separating Holy Island from Anglesey is the extension of the Afon Alaw estuary; it is low lying with areas of saltmarsh and mudflat. An important geomorphological feature on the north coast is the shingle ridge and tidal lagoon located within Cemlyn Bay.

On the eastern coast of the island there are several large sandy bays that

	<p>have formed in the drowned river valleys after the last glaciation. At Dulas Bay, the spit across the entrance has created an estuarine environment. While at Lligwy Bay and Traeth-coch the environment is more exposed. In addition there are also smaller bays between the cliffs such as Traeth Benllech and Traeth Bychan.</p>
Drift	<p>On the western side of the island the drift is slight southerly across the beaches at Rhosneigr and the Afon Ffraw estuary. These areas are self contained as drift is constrained by the rock headlands. The sandy bays of Holy Island and the north coast are self contained sediment units with no significant movement of material across the headlands. On the eastern side of the island the drift is south easterly and there are two distinct sediment units split by Ynys Molfre. To the south, Traeth-coch traps sediment, while little continues onwards towards the Menai Straits.</p>
Erosion/ Accretion:	<p>Erosion has been noted at Porth Trefadog and Porth-Tywyn-mawr on the west facing coastline north of the Afon Alaw. The soft clay cliffs at Llanbadrig on the northern coast are vulnerable to erosion and the cliffs north of Portobello and the Afon Dulas are also eroding. Trearddur Bay and Porth Dina are also vulnerable to erosion, and the frontage at Rhosneigr is under pressure. The pressure on the whole coast will increase with sea level rise.</p> <p>Sediment is accumulating in Traeth-coch and saltmarsh is developing in the inner areas.</p>
LONG TERM EVOLUTION: <i>(unconstrained)</i>	<p>The coast is generally very constrained by the hard geology both in terms of its position and with respect to sediment drift. At present there are areas of generally slow erosion over the soft cliffs and areas of relatively stable dunes. The long term behaviour of the shoreline is for continuation of this slow erosion but increasing with sea level rise. With sea level rise there would be increased tidal prism within the inlet between the mainland and holy island. This could result in change particularly to the southern entrance.</p>
FLOOD RISK	<p>On the western side of the island there is flood risk associated with the Afon Ffraw valley, the Afon Crigyll and outflow of the Llyn Maelog at Rhosneigr, at RAF Valley and at Trearddur Bay. The low lying land surrounding the Afon Alaw Estuary on Anglesey and Holy Island, and the docks and station at Holyhead are also at risk.</p> <p>The northern coastline has limited flood risk, this principally in the area of Cemlyn Bay.</p> <p>There are areas of flood risk associated with the rivers that discharge at Porth y Felin and Amlwch.</p> <p>The floodplains of the Afon Goch, Afon Lligwy, Afon Marchogion and Afon Marchogion are at risk on the eastern side of Anglesey. In addition the low lying land behind Traeth-coch is at risk of flooding.</p>

1.3 Present Management and Key Issues and Objectives

Existing management practice

The following table sets out SMP1 policy (developed over 50 year period), how the coast has been subdivided into management units and where relevant where more recent decisions have been made, or discussion is on going with respect to individual areas.

SMP 1				Subsequent Management Approach
No.	Unit	Policy	Ch.	
Anglesey				
2.3	Dinas Iwyd to Cwnigar Trefi	DN		
2.4	Tywyn Aberffraw	SHTL		
2.5	Tywyn Aberffraw to Porth Nobla	DN		
2.6	Porth Nobla to Rhosneigr	SHTL/MR		
2.7	Rhosneigr	SHTL		
2.8	RAF Valley	DN		
2.9	Plas Cymran to Four Mile Bridge(both sides)	DN		
2.10	Plas Cymran to Holyhead	DN		
2.10a	Silver bay	DN		
2.10b	Borthwen	SHTL/MR		
2.10c	Porth Diana	HTL		
2.10d	Treaddur Bay	HTL		Recent strategy confirms HTL.
2.10e	Treaddur to Porth y Post	SHTL		
2.10f	Porth Dafarch	HTL		
2.11	Holyhead to A5 bridge	SHTL/MR		
2.12	Four Mile Bridge to A5 bridge (both sides)	DN		
2.13	Newlands Park	SHTL/MR		
2.14	Alaw Estuary	DN/MR		
2.15	Afon Alaw to Penrhyn	DN/MR		
2.17	Cregiau Cliperau to Carmel head	DN		
2.17a	Porth Tywyn-mawr	DN/HTL		
2.17b	Porth Trefadog	HTL		
2.17c	Porth Trywn	DN		
2.17d	Porth Swtan	DN/MR		
2.18	The Skerries	DN		
3.1	Carmel Head to Point Lynas	DN		
3.1a	Cemlyn Bay	DN/MR		
3.1b	Wylfa Power Station	DN		
3.1c	Cemaes Bay	DN/HTL		
3.1d	Bull Bay village	DN/HTL		
3.1e	Amlwch Port	DN/HTL		
3.1f	Porth Eilian	HTL		
4.1	Point Lynas to Portobello	DN		
4.2	Portobello to Ynys Moelfre	DN		
4.3	Ynys Moelfre to Huslan	DN		
4.3a	Traeth Bychan	DN		

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

Key: DN – do nothing, HTL – Hold the Line, SHTL – Selectively Hold the Line, R – Retreat, deferred – policy deferred subject to further monitoring or study.

Under SMP 1 the policy is for Do Nothing or No Active Intervention along the majority of the currently undefended natural coastline, with management where there are existing coastal settlements. The possibility of managed realignment is suggested between Porth Nolba and Rhosneigr, at Borthwen, between Holyhead and the A5 Bridge, at Newlands Park and in the Alaw Estuary, at Porth Swatan and Cemlyn Bay. A key difficulty within the SMP1 was one of scale due to the many sections of local defence. This led to policies of DN for the larger sections of natural shoreline interspersed within policy units for HTL to local lengths of defence. The general assessment was that management might be sustained as at present in these areas. Critically these policies were developed over a period of 50 years and with significantly less impact of sea level rise.

Key Management issues

The largest centre of settlement within this coastal area is Holyhead and the maintenance of the town for both its regional economic and international transport gateway value is key to the spatial planning objectives for the whole area. Holyhead is the centre of a Secondary Hub within the Wales Spatial Plan and the focus of much of the planned future investment in the area. Therefore, maintaining the port operations at Holyhead is seen as vital to sustaining this regional intent. There are, however, flood risk areas threatening the train station and main docks area that need to be managed to sustain the operation of the port. Integral to this objective is the maintenance to the access route from the mainland to Holyhead, and therefore management of the Stanley Embankment is also a key issue.

The transportation links to Holyhead of the mainline railway line and A55 are at risk from flooding south of the Stanley Embankment in the vicinity of Valley, Rhosneigr and the Cefni Estuary (discussed in Coastal Area F). The main A-roads that serve the north and south of the island are locally at risk from the Afon Dulas, at Dwyran, behind the Cob in the Cefni Estuary, at Rhosneigr and around Valley. The B4545 on Holy Island is at risk in several locations between the Four Mile Bridge and Trearddur. Maintaining the viability of the local and national transport networks is important to sustaining the communities of the area and the key economic interests. Locally access routes to isolated properties at the coast will also be under increasing risk from flooding.

The Cefni Estuary is currently truncated by The Cob embankment that provides flood protection to a significant area of southern Anglesey. With sea level rise this will become increasingly more difficult to maintain and if lost would lead to flood risk to the mainline railway line to Holyhead, A55, A4080 and parts of southern Llangefni. Therefore the future management of flood risk in the Cefni Valley is important for the major transport routes for the majority of Anglesey covered by this Coastal Area.

RAF Valley is another significant asset that provides employment to the region and is the headquarters of the UK Search and Rescue Service and fast jet training. There is

flood risk to buildings on the southwest and western sides of the airfield which need to be managed to enable operations to be sustained.

Amlwch on the northern coast of the island is designated the centre of a local hub in the spatial planning framework. The town provides the main centre for this part of the island and a focus for economic activity. Maintaining Amlwch is therefore important in terms of the economic sustainability for the region.

There are some other smaller settlements at risk from significant flooding in the future; Valley, Trearddur and Rhosneigr. The latter two are also important as centres for tourism, and along with the other tourism-reliant centres on the east coast the issue of coastal squeeze on the important beaches will increasingly become an issue.

Alongside these issues are those of maintaining the cultural and historic values of the area, with its important historic context and historic environment; underpinning all of this is the maintenance of the important natural environment.

In addition to the main areas of concern identified above, there are a wide variety of smaller villages and hamlets situated around the coastal area. This is a strong characteristic of the coast and these local more remote settlements contribute to the attraction both in terms of landscape and in terms of economic value to the island.

While there are nationally important features, a lot of the management issues are quite specific and local in impact. The main issues are summarised as:

- The risks to the functioning and potential development of the port of Holyhead
- The risks to the operations at RAF Valley
- The risk of flooding to the main towns and locally to other smaller settlements.
- Potential loss of or significant impact on local communities.
- The disruption to the regional and local transport system.
- The potential loss of essential character of some of the small bays and beaches due to coastal squeeze and the general impact on both tourism and nature conservation values.
- The loss of specific heritage features and deterioration in the historic environment.

The general character and values of the area, with respect to shoreline management, can be brought together in the following summary.

Underpinning the whole area is its important natural and historic landscape, nature conservation and geology. The Isle of Anglesey AONB has one of the most distinctive, attractive and varied landscapes in the British Isles. Anglesey was designated as an AONB in 1966 (confirmed in 1967) in order to protect the aesthetic appeal and variety of the island's coastal landscapes and habitats from inappropriate development.

Economically the area is heavily defined by the influence of Holyhead which is seen as the key centre for development of the existing strategic transport links and the economic benefits that this brings to the area. Maintaining the transport links between Holyhead and the mainland across the rest of Anglesey is a key aspect to the future plans for the area as a whole. In addition to Holyhead the western coast has several smaller settlements that are important for tourism and high quality residential value.

The northern coast is defined by the high rocky cliffs which prevent extensive development at the coast. The main centre in this frontage is Amlwch which is mostly set back from the coast with the small harbour located in a small inlet.

The east coast tends to have a differing landscape quality to that of the west coast, resulting from the sheltered orientation. There are larger settlements which tend to be slightly more set back from the shoreline. The extensive beaches around Moelfre and Benllech support a local centre for tourism.

To address these specific characteristics, the coast is divided into three Policy Development Zones (PDZs), as set out below:

- PDZ17 Holy Island and West Anglesey:**
Twyn y Parc to Twyn Cliperau
Isle of Anglesey Chainage: 49km to 101km
- PDZ18 North Anglesey:**
Twyn Cliperau to Trwyn Cwmrwd
Isle of Anglesey Chainage: 101km to 157km.
- PDZ19 East Bays:**
Trwyn Cwmrwd to Trwyn Penmon
Isle of Anglesey Chainage: 157km to 192km.

Overarching objectives are defined based on the overall principles upon which the SMP is developed and drawing together the various specific detailed objectives set out in the features and issues table contained within Appendix ***. These overarching objectives aim to guide the assessment of different management scenarios and the development of individual SMP policies.

Overall Objectives

Principles	Objectives	Relevant to
To contribute to sustainable communities and development	<ul style="list-style-type: none"> • Reduce risk to life • Protect properties from flood and erosion loss. 	All All
To minimise reliance on defence and increase resilience of communities.	<ul style="list-style-type: none"> • Minimise the need for increasing effort and management of coastal defences • Avoid reliance on defence particularly where there is a risk of catastrophic failure 	All PDZ17
To support an integrated approach to spatial planning, in particular recognising the interrelationships between:		
- centres of development and surrounding communities.	<ul style="list-style-type: none"> • Maintain access to local centres, villages and isolated properties • Maintain important local centres supporting the smaller communities. 	All All
- human activity and the natural and historic environment: in being essential for community identity, well being and vitality and in being highly significant for tourism and economic regeneration.	<ul style="list-style-type: none"> • 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 	All All All
To maintain and support the main centres of economic activity	<ul style="list-style-type: none"> • To maintain Holyhead as a viable commercial centre and support opportunities for regeneration. • To maintain operation of RAF Valley 	PDZ17 PDZ17
To sustain the vitality and support adaptation of smaller scale settlements.	<ul style="list-style-type: none"> • Maintain character and integrity of coastal communities • Maintain agricultural value of rural community 	All All
To support the cultural heritage and the use of the Welsh language.	<ul style="list-style-type: none"> • 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 	All All All
To avoid damage to and seek opportunity to enhance the natural environment.	<ul style="list-style-type: none"> • 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. 	All All All
To maintain or enhance the high quality landscape.	<ul style="list-style-type: none"> • Avoid damage to and enhance the natural landscape. • Maintain the human landscape and character of communities 	All All

To sustain sustainable accessibility in terms of maintaining national and regional connectivity	<ul style="list-style-type: none"> • Maintain the road and rail links to Holyhead and RAF Valley • Maintain Holyhead as a functioning port • Maintain access to larger settlements for smaller farming communities. 	PDZ17 PDZ17 All
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Note: All objectives would be assessed in each management scenario, not all objectives will necessarily be met.