4. Policy development and the preferred Plan

Contents

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4.1 Introduction

4.1.1 General principles and objectives for managing the Isle of Wight shoreline

Figure 4.1.1 Aerial view of the Isle of Wight, viewed from the south (Isle of Wight Council)

Chapter 1 of the Shoreline Management Plan (SMP) outlines the overall aim of the SMP process. This is the need to develop a long-term sustainable plan recognising the connectivity along the whole SMP coastline, whilst also maintaining the attention to detail that will result in the plan being deliverable and effective at a local scale.

There are diverse and important issues that provide the baseline for why there is the need to manage the coast and manage flood and coastal erosion risks. These are outlined below, and discussed in Chapter 3. It is these issues that the SMP attempts to address, which provide the framework for the development of the plan. Based upon these issues, and incorporating national and regional policy, a set of overall principles or objectives have been adopted to guide the development of the Isle of Wight SMP:

Objectives:-

- To support an integrated approach to spatial planning, in particular recognising the interrelationships between:
  - Centres of development and surrounding communities;
  - 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.
- To contribute to sustainable communities and development
  - To maintain and support the main centres of economic activity;
  - To sustain the vitality and support adaptation of smaller scale settlements.
- To maintain the iconic status of the Isle of Wight.
- To minimise reliance on coastal defence and increase the resilience of communities.
- To maintain or enhance the high quality landscape.
- To support tourism and recreational opportunities.
- To support the cultural heritage.
- To avoid damage to and seek sustainable opportunities to enhance the natural environment.
- To maintain access to and from the Island.

The development of these objectives was discussed with the Client Steering Group (CSG) (who led the development of the plan) and the key stakeholder group including Elected Members.

A number of factors are important in setting the context for shoreline management on the Isle of Wight and assessing how the above objectives are met:

- The Isle of Wight is characterised by its unique reliance on the coastal zone. Many of the 138,000 Island residents live in towns which are located around the coastline of the Isle of

Wight and Newport located at the head of the Medina Estuary. A number of villages and smaller communities are also located on the coast and inland.

- The Island is 37 kilometres in length from the Needles in the west to Bembridge in the east, and 21 kilometres from Cowes in the north to Ventnor in the south; for a total of 380 square kilometres. The coastline, including estuaries, is approximately 168km in length. The largest towns are located in the centre, north and east of the Island (Newport, Cowes, East Cowes, Ryde, Sandown and Shanklin), and most of the Island's residents live in these towns. Totland, Yarmouth and Freshwater are also significant settlements in the west of the Island.

- The Isle of Wight relies upon six ferry routes providing essential transport links to Portsmouth, Southampton and Lymington, with hundreds of crossings every day. The ferry terminals and associated infrastructure are located by necessity on the shoreline and will be vulnerable to future increases in flood and erosion risks in Ryde, Cowes, East Cowes and Yarmouth.

- The coastal towns, scenery and transport links of the Isle of Wight play vital roles in supporting the economic viability of the community, in terms of both the tourism industry (particularly linked to sea fronts, commercial waterfronts along the estuaries, promenades and beaches) and marine industries. Tourism is a major industry on the Island with the population more than doubling during the busy summer holiday season in July and August. The unique characteristics of the Island and its tranquil and beautiful reputation have also drawn a significant number of retirees and second home owners.

- The spectacular natural environment of the Isle of Wight (including the open coast, sea cliffs, beaches and estuaries) is highly regarded and it is often the characteristics of coastal change which contribute to the value of the frontages as much as any specific existing aspect of that changing environment. The Island is home to a rich variety of important habitats, species and sites, with 70% of the Island protected by UK or European environmental designations. The natural, historic and built environment is a major asset for residents and visitors. More than half of the Island is designated as an Area of Outstanding Natural Beauty (51%).

- In addition to the challenges of future coastal erosion and sea flooding, the coastal towns of Ventnor and areas of Cowes-Gurnard are underlain by deep-seated landslide complexes. The Ventnor Undercliff landslide complex is the largest urbanised landslide complex in England and Wales, and one of the largest in north-west Europe. Sea level rise and increased winter rainfall will affect slope stability in some areas and is an important consideration in shoreline management policy in these areas.

More specific drivers and objectives, reflecting the general characteristics of each section of the coast, are discussed below.

4.1.2 High level Plan development (the importance of considering interdependencies within the SMP area)

The aim of the SMP is to provide a consistent approach to flood and coastal erosion risk management over the whole of the frontage of sediment sub-cells 5d & e. This consistency has to ensure that decisions in one area take account of the impact they have in other areas in terms of physical processes and geomorphology. It is also essential to take account of any impacts on or interrelationships between the socio-economic and ecological values identified for different areas of the coast, as these characteristics are the real drivers behind any intent of management.

The review of coastal processes (Appendix C) and the thematic review (Appendix D) reveal that the coastline is characterised by a wide variety of physical processes, ecology and socio-economic activity, with strong interrelationships between these areas and themes. The large-scale issues driving shoreline management are identified in the high level objectives discussed above, but these have to be recognised, themselves, as being interdependent. Management decisions in one area of the coast may have a significant influence elsewhere on how best to manage other areas or other interests. Such interaction may be quite local (between adjacent policy units), may extend over substantial lengths of coast (linking together the decision-making process over a group of policies) or may have potentially cumulative impacts that have to be viewed at the scale of the whole SMP; or indeed beyond the area of the SMP. In developing individual policy units, therefore, it is necessary to maintain a broad perspective of potential impacts, within which to consider important local issues.

In line with the procedural guidance for SMP2, a hierarchical approach is taken. This initial section of the plan and policy development process assesses the whole SMP coastline, considering how potential general management scenarios might influence long-term coastal change.

4.1.3 Comparison of Management Scenarios for the SMP Area (a summary of future risks for the Isle of Wight)

Description of the physical structure and key features of the Isle of Wight:

The SMP area is shown in Figure 4.1.2, illustrating the key towns and principal A-roads. The Isle of Wight coast and estuaries form a dynamic coast with a wide variety of coastal scenery in a relatively small area.

Figure 4.1.2 An overview of the Isle of Wight SMP area (Isle of Wight Council).

The solid geology of the Isle of Wight is characterised by a sequence of relatively unresistant sand, mud and clay strata. The structure of the Island is dominated by a strong east-west monocline fold which allows the Chalk (the most resistant rock type) to dominate the landscape of the Island by forming the ridge which runs through the centre of the Island, maintaining exposed headlands at either end -at The Needles in the west and Culver Cliff in the east- and capping the southern hills. The outcrop of the resistant Chalk is shown in Figure 4.1.3.

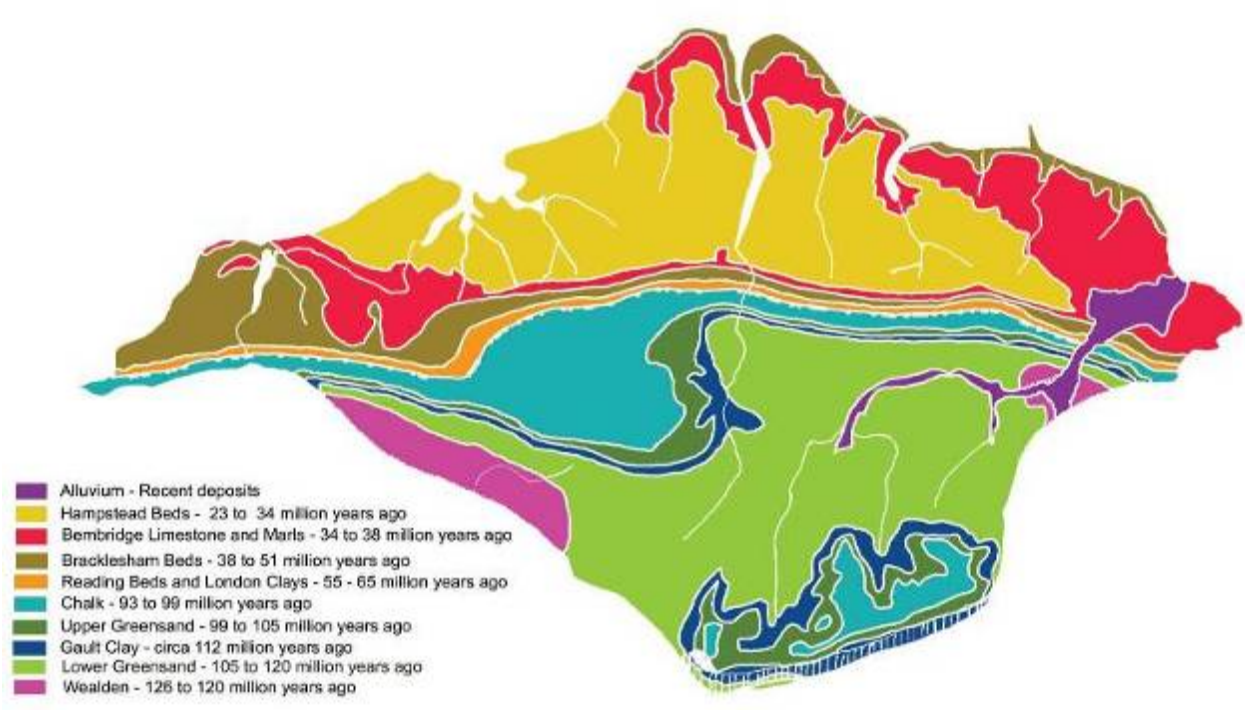

Figure 4.1.3 Geological map of the Isle of Wight (Isle of Wight Council)

As sea levels rose at the end of the last Ice Age, the former Solent River valley flooded, forming today's Solent separating the Isle of Wight from the mainland by a distance of 3-5km. The Solent (northern) coast of the Isle of Wight is more sheltered than the southern coast, which is exposed to Channel and Atlantic storm waves.

Marine erosion has continued around most of the Island to produce a near-continuous cliff line that varies greatly in terms of morphology, weathering and landslide activity, except where the cliff line is interrupted by coastal towns and promenades. There are distinct differences between the exposed southerly and westerly coasts (potentially rapid marine erosion) and the relatively sheltered north coast (more modest toe erosion).

The northern coast of the Isle of Wight is generally characterised by relatively low-lying coastal slopes, with five estuaries and rivers draining north into the Solent: the Western Yar; Newtown Estuary; Medina Estuary; Wootton Creek; and the Eastern Yar. By contrast the southern coast is generally characterised by steep coastal cliffs and landslides. Cliff erosion materials deposited on the foreshore are valuable inputs to the immediate littoral system and also contribute to beaches further downdrift and can provide temporary protection of the cliff toe. In spite of continued sediment inputs derived from cliff erosion, generally local beaches are not large as the sediments continue to be removed, so the beaches are often dependent upon continued inputs for their stability and even survival. The exposed (high wave energy) southern coasts have greater potential for shoreline sediment transport compared to those along the sheltered environments of the Solent to the north. Nevertheless, strong tidal currents are generated in the western Solent and these contribute towards sediment mobility in specific areas. In contrast to the general trend of erosion, a key area of significant sediment accretion is at Ryde Sands on the north-east coast of the Island. A prominent feature of the south coast is the 12 km in length Ventnor Undercliff - an ancient coastal landslide complex extending from Luccombe in the east to Blackgang in the west.

The coastline continues to change. This can be clearly seen in the retreat of the cliffs of the south-west coast, but is also occurring along the less-accessible northern coasts of the Isle of Wight. Seasonal drift of accreted sandy sediments can be seen at Appley and Ryde Sands and local changes in beach levels observed around the coast of the Isle of Wight following winter storms. In

the longer term (and into the 100 year period of the SMP) these trends and pressures are likely to continue and will create significant challenges to future, appropriate management.

Description of future risks under the 'No Active Intervention' scenario:

The soft rock geology of the Isle of Wight coast is generally exposed and actively eroding, and this behaviour will continue over the next 100 years and beyond as sea level rises and wave attack of the shoreline continues. On the southern coast, cliffs will continue to erode or reactivate, and on the northern coast the generally more gentle coastal slopes will erode and areas of tidal inundation will also occur.

If no further maintenance or replacement of coastal defences occurs, a legacy of historical defences will generally fail towards the end of epoch 1 (0-20 years) or early in epoch 2 (20-50 years), exposing the majority of Isle of Wight coastal communities to the impacts and risks of erosion and shoreline retreat in the medium to long term. However, allowing the natural process of cliff retreat along areas such as the south-west coast will supply sediments to the shoreline and the littoral drift system.

Tidal flooding is a serious risk to the future of low-lying areas within the towns of Yarmouth, Freshwater, Cowes, East Cowes, Ryde, Seaview, Bembridge and Sandown/Yaverland. Over the next 100 years coastal erosion and tidal inundation will affect all the ferry transport infrastructure that the Isle of Wight relies upon.

If 'no active intervention' (NAI) takes places, tidal inundation of the Eastern Yar and Western Yar valleys will occur if the defences at the northern and/or southern ends of both valleys fail. This would potentially cut off transport links to the communities of Bembridge/Forelands and Freshwater/Totland, and could create three 'Isles of Wight' in the long-term. Coordinated decision-making is essential along these frontages.

Coastal erosion and oversteepening of coastal slopes has the potential to promote coastal slope retreat or larger-scale reactivation of coastal landslide complexes affecting the town of Ventnor (and the villages in the Ventnor Undercliff) and areas of Cowes, Gurnard, Totland and Seagrove Bay.

More detailed information on the consequences of a scenario in which 'no active intervention' is undertaken at the coast can be found in Appendix C3 of this SMP.

Consequences for the communities of the Isle of Wight:

The general objectives of reducing reliance on defences, avoiding damage to the natural environment and moving towards more sustainable communities are targeted by the changes outlined above; however the majority of objectives outlined in section 4.1.1 are not achieved. For example, this approach does not contribute to sustainable communities by supporting the main centres of economic activity or tourism, support the vitality and adaptation of smaller-scale settlements, or maintain access to and from the Island. A loss of confidence in coastal towns and deterioration of the economic viability of the area is likely. The consequences of loss of coastal habitats also need to be examined in further detail.

In terms of management objectives, the NAI scenario highlights the need to manage the coast and its future evolution to support an integrated approach to coastal planning. The Isle of Wight is characterised by both its natural beauty and its intrinsic value in terms of sustaining coastal communities. The objective for management of the natural environment is not in conflict with that of meeting the overall intent of delivering human aspirations. At the broader scale, acceptance that a significant proportion of this SMP frontage will remain a managed area is important. Coastal change will occur, but management of the coast can allow communities to adapt to these changes.

Description of future risks under the 'With Present Management' scenario:

If current shoreline management practices are continued (i.e. a scenario known as continuing 'with present management') the defences fronting coastal towns around the Isle of Wight will be maintained at their current standard and so effectively prevent coastal erosion and cliff retreat in many areas. In this scenario maintaining the defences at their 'current standard' is defined as maintaining the seawall at it's current height, for example, but not raising the level, so the defences offer reducing standards of service over time. Consequently, in future epochs (particularly over 50-100 years) the defences will be increasingly affected by wave and tidal overtopping and falling beach levels will expose the toe of defences to wave attack and undermining.

Significant lengths of coast will continue to erode and will gradually outflank the hard defence structures (such as seawalls) which front the promenades of the coastal towns including East Cowes, Ryde, Seagrove Bay, Bembridge, Yaverland, Shanklin, Ventnor, Freshwater Bay, Totland, Colwell, Yarmouth, Gurnard and Cowes. Therefore due to the increasing exposure of each defence structure, the suitability and effectiveness of the hard defence in each location needs to be considered as risk levels increase.

A key risk under the 'with present management' scenario is that, with defences maintained at their current standard, the risk of tidal flooding remains for many coastal communities. Tidal inundation already affects defended areas within Yarmouth, Cowes and East Cowes and will worsen as sea level rises by approximately 1 metre over the next 100 years.

The ground stability of coastal landslide complexes underlying the towns and villages of Ventnor, Niton, Cowes and Gurnard could be maintained by improving the current coastal defences, but areas may still reactivate due to their sensitivity to the impacts of increasing winter rainfall. However, toe erosion and toe weighting is essential to their stability and would minimise the risk of reactivation.

More detailed information on the consequences of a scenario of continuing 'with present management' at the coast can be found in Appendix C3 of this SMP.

Consequences for the communities of the Isle of Wight:

Similar to the impact of the 'no active intervention' scenario outlined above, the consequences of continuing 'with present management' do not fully deliver the objectives outlined in section 4.1.1 by not considering adequately the interactions along the coast and not allowing a fully sustainable, integrated approach to spatial planning. It does however provide a vision against which the potential impacts of management can be understood and sustainable communities be developed.

4.1.4 Defining the Policy Development Zones (PDZ)

With the understanding outlined in the scenarios above, it is possible to consider where key high level decisions have to be made. This includes drivers such as (but not limited to); the integrated management of east and west Wight, respectively, to ensure flood risk does not physically separate these sections of land; the future development of Cowes and East Cowes and the impacts on both the Medina Estuary and Newport; the economic viability of Ryde; and Ventnor and the longer term impacts of the landslide complex. These large scale issues present an opportunity to look at sections of the Island on a larger scale, grouping areas with similar issues that can be managed together. Sections of the coast are considered with respect to their influence on (and

interaction with) other areas of the SMP and a series of seven Policy Development Zones (PDZ) have been identified (see Figure 4.1.4).

The boundaries are recognised not to be hard lines and there is a recognition that locally across boundaries, there will be issues in common. In effect, the PDZ's set the playing field for the detailed development of the Plan and policies for three epochs (the next 20, 50 and 100 years).

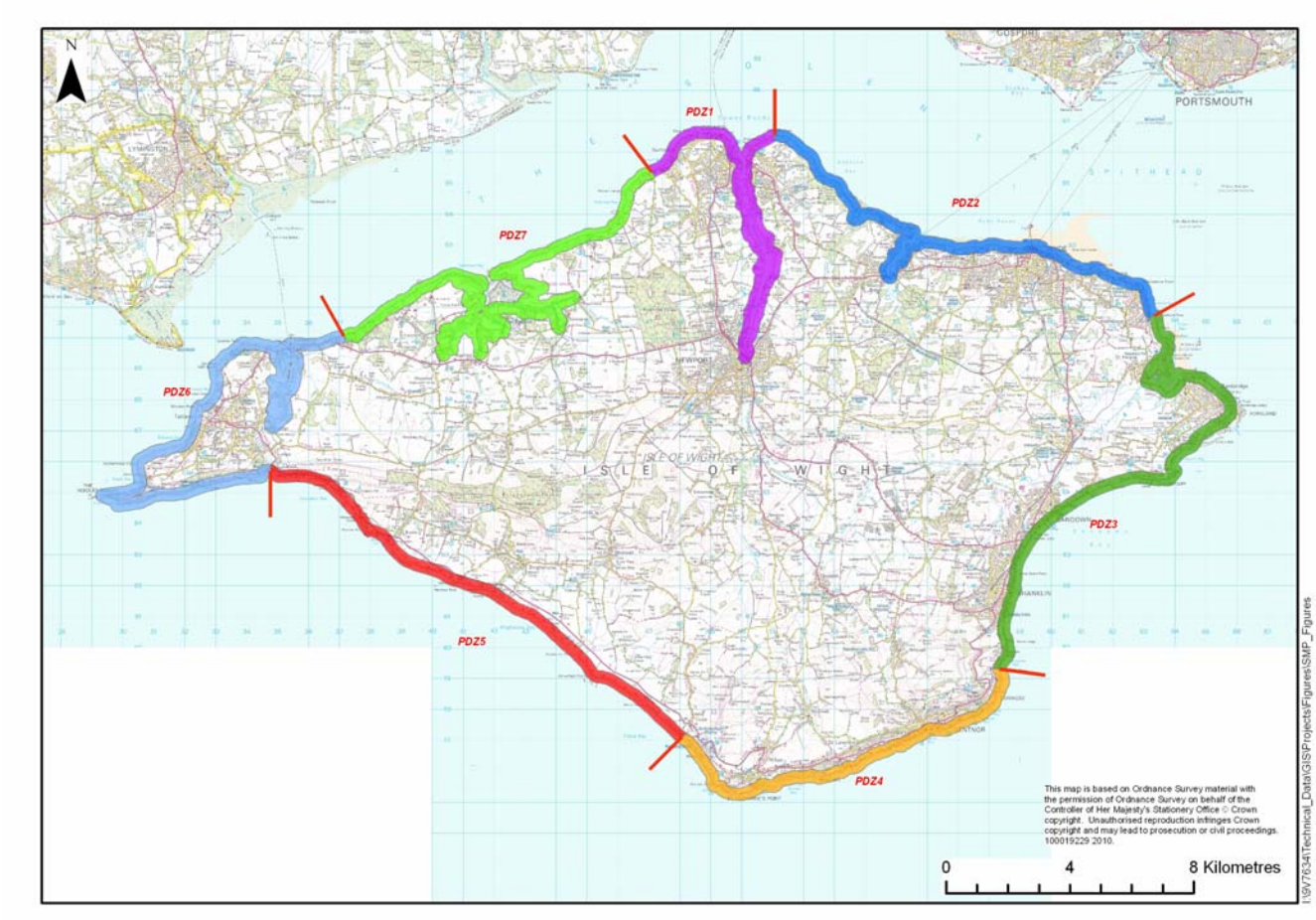

Figure 4.1.4 Isle of Wight SMP2 Policy Development Zones (PDZs).

PDZ1 – Cowes and the Medina Estuary

Key drivers in this area: This area includes Cowes, East Cowes, Gurnard, the Medina Estuary and Newport Harbour. Large residential communities and town centres are at significant risk from tidal flooding, alongside key tourism and marine industries driven by their waterfront location. Erosion around the headlands may trigger areas of slope instability affecting properties and access within sections of Cowes and Gurnard. Properties, businesses, ferry terminals and marine industries along the waterfront of Cowes, East Cowes, Medina Estuary and Newport Harbour are at risk, as well as areas of saltmarsh. There are significant redevelopment plans for areas of East Cowes and Cowes Harbour.

PDZ2 – Ryde and the North-east Coastline

Key drivers in this area: This area includes Osborne, Wootton Creek, Ryde and Seaview. The large residential communities, amenity and access are key drivers in this area. The functioning of the residential and tourism centre of Ryde is at risk alongside seafront areas within the surrounding communities at Wootton, Woodside, Fishbourne, Appley, Springvale, Seaview and Seagrove Bay. Key transport infrastructure at Ryde and Fishbourne will be affected (ferries, rail and road). The quiet wooded coastal landscapes in the west of the PDZ are also a key characteristic of the area.

PDZ3 – Bembridge and Sandown Bay

Key drivers in this area: This area includes Bembridge Harbour, Bembridge, Forelands and Sandown Bay. Residential communities are present along much of the coastline of this PDZ and especially in Sandown Bay they rely heavily on the tourism industry and amenity infrastructure. The natural environment is also a key driver in terms of the open and evolving coastal cliffs at Whitecliff Bay, Culver and Luccombe, the ledges at Bembridge, and also particularly the internationally important habitats of the Eastern Yar Valley and around Bembridge Harbour.

PDZ4 – Ventnor and the Undercliff

Key drivers in this area: The residential and business communities of Ventnor, Bonchurch, St. Lawrence, Niton and Blackgang along with transport links, are key issues in this area. The underlying landslide topography gives rise to the unique pattern of development, natural environment and coastal scenery found in this PDZ, which is unique in scale in England.

PDZ5 – South-west Coastline

Key drivers in this area: From Blackgang to Compton, significant drivers of shoreline policy in this area are the overriding the importance of the natural landscape and scenery, nature conservation designations, unique geology and continuous sediment supply from eroding cliffs -which controls the behaviour of the beaches and longshore drift system to the east (anti-clockwise around the Isle of Wight). A further driver is the 'Military Road' transport link running adjacent to the coastal cliffs,and the cliff-top coastal footpath, although the future of this road is currently being decided by the Isle of Wight Council. This is a popular tourist route –one the most spectacular sections of the 'round the Island' coastal road, which also provides access to scattered coastal communities and properties, which will be significantly affected by future breaches in the line of the coastal road. The road has been set-back and maintained in several locations previously, marking a substantial investment, but the road is now threatened near Brook, where the carriageway is located approx. 5m from the weak cliff edge (in November 2010) after recent failures in this area. Upgrading and widening an alternative inland route would require further substantial investment. There will be local specific issues where small communities and properties lie adjacent to the changing coastline. It is a popular coastline for tourism use.

PDZ6 – West Wight

Key drivers in this area: This area includes Freshwater, Totland and Yarmouth. The loss or deterioration of residential communities due to erosion and flooding is a key risk in this PDZ, including significant tidal flood risk at Yarmouth and Freshwater. Key road links through Freshwater and Yarmouth are also at risk, as well as the ferry terminal at Yarmouth. The internationally important habitats of the Western Yar valley and the spectacular coastal scenery surrounding the Needles peninsula are also key features of the area, and important to the tourism industry supporting West Wight communities.

PDZ7 –North-west Coastline

Key drivers in this area: From Bouldnor to Thorness the high-quality designated natural environment, relative inaccessibility and tranquillity of this coastline, including the Newtown Estuary, are key features of the area, where the coast is generally evolving naturally. There will be local specific issues where small communities lie adjacent to the changing coastline.

4.1.5 Conclusions on the Policy Development Zones

The above assessments and consideration of high level scenarios sets a framework for consideration of sections of the Isle of Wight coast in greater detail. The issues and risks outlined

above are described in chapter 4 and the Appendices to develop a co-ordinated set of shoreline management policies for each policy development zone -and between neighbouring zones- for the next 20, 50 and 100 years.

The main conclusions at this stage are that:

- At an SMP level, the management of the frontages within the Isle of Wight Policy Development Zones is not going to impact on general policy for neighbouring SMP areas in terms of coastal processes and sediment supply. The Isle of Wight SMP policies can therefore be developed at a more local level considering the shoreline management of each section of the frontage.
- There are significant issues linked to the potential future tidal inundation of the Western and Eastern Yar valleys for the communities directly affected in the adjacent flood and erosion risk zones, but also for the wider communities accessed via road links across the floodplains.
- There are current and increasing future tidal flood risks to communities and infrastructure within Yarmouth, Cowes, East Cowes, Ryde, Sandown and possibly Newport town centres. This increasing sea level will lead to a reduction in tide-locked drainage and require investment in the land-drainage infrastructure.
- The eroding cliffs characterising the Isle of Wight coast will retreat and place a zone of properties at risk in many towns and villages, in some cases with clear local impacts and in others areas also affecting infrastructure, transport links or economic drivers of importance to the effective functioning of the communities.
- The risks of deep-seated landslide reactivation affecting the Ventnor Undercliff and Cowes-Gurnard communities need to be considered alongside the role of shoreline management policies in reducing levels of risk.
- The natural environment, nature conservation interest, heritage, geology and coastal and estuarine scenery are of vital importance to the character of the Isle of Wight. Beaches are often reliant on local sediment supply from eroding shorelines.
- The main ‘round the island’ coastal road is at risk from erosion or tidal inundation in various locations over the next 100 years (including the along the Ventnor Undercliff, south-west coast, Freshwater, Yarmouth, Wootton, Ryde and Morton) and will require adaptation.
- Key economic drivers of the Isle of Wight including tourism and marine industries, as well as essential ferry transport links, are dependent on coastal locations and will require adaptation.
- Potential loss in beach-width due to sea-level rise would have adverse consequences for the tourism industry in a number of areas, although would also be dependent on erosion rates and future sediment supply.