4.2 Policy Development Zone 1 – Cowes and the Medina Estuary (PDZ1)

Left to right: Looking north along the Medina (Cowes Harbour Commissioners), Aerial View of Cowes and East Cowes, Cowes seawall

4.2 Policy Development Zone 1 – Cowes and the Medina Estuary (PDZ1)

Contents

Key facts:

Policy Development Zone 1: includes the communities of Gurnard, Cowes, East Cowes and surrounding the Medina Estuary.

PDZ1 frontage = approximately. 26km in length (including the Medina Estuary)

PDZ1 boundaries = from Gurnard Luck to Old Castle Point (East Cowes)

As listed in SMP2 Appendices: areas IW55 to IW59, & IW1

Old policies from SMP1 in 1997, reviewed in this chapter:

Unit	Location	Length	Policy
NEW11	Gurnard Luck	460m	Hold the existing defence line
NEW12	West of Gurnard to Egypt Point	1744m	Hold the existing defence line
NEW13	Egypt Point to Cowes Castle	1010m	Hold the existing defence line *Or* Advance the existing defence line
NEW14	Cowes Harbour	2470m	Hold the existing defence line *Or* Advance the existing defence line
NEW15	Cowes Breakwater to Old Castle Point	880m	Hold the existing defence line *Or* Retreat the existing defence line

Shoreline Management Plan Sub Cell 5D + E - Isle of Wight
Baseline Location Map
Policy Development Zone 1 - Cowes and the Medina Estuary

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1. Overview & Description

1.1 Principal Features (further details are provided in Appendix D)

Built Environment:

Together the towns of Gurnard, Cowes and East Cowes form significant waterside communities at risk from both coastal flooding and erosion. The towns of Cowes and East Cowes have mostly promenades and residential frontages facing the Solent, with commercial, industrial frontages within the estuary mouth, including widespread harbourside facilities and marinas. Red Funnel operates a high speed passenger service from Cowes to Southampton and a car ferry service from East Cowes to Southampton. The main transport route connecting Cowes and East Cowes is the floating bridge, which is a chain ferry, without which it is necessary to drive inland around the length of the estuary. The road network is centred around the A3020 running south along the west of the Medina valley to the Island's country town, Newport.

Flood risk is reduced to holiday homes and properties at Gurnard Luck through the management of tidal water levels at the bridge on Marsh Road. Tidal flood risk at both Cowes and East Cowes is mitigated by an ad-hoc series of both private, Isle of Wight Council and Environment Agency seawalls and quays, some of which also provide recreational access to the Solent. These defences provide only a moderate standard of protection (1 in 25 years).

The Medina Estuary extends 6.8km southwards from Cowes and East Cowes to its tidal limit at Newport Harbour. Along its length are a number of farms, scattered residential areas, recreational and commercial moorings and sewage works. There is a marina and residential development on the east bank at Island Harbour. Towards the town of Newport there are industrial sites along the western frontage of the estuary and a cemetery on the eastern bank. The upper estuary around Newport Harbour is surrounded by properties, waterside offices, commercial units, quayside and wharf frontages.

Commercial wharfs and quays are sporadically distributed along both banks of the Medina Estuary from Cowes and East Cowes to Newport. The Island is wholly reliant on imports for hard stone construction and imports around 50% of its sand and gravel requirement, which is likely to increase through the planned highways improvement Public Finance Initiative (PFI). All bulk cargo transported by sea (as opposed to lorry-based) including all aggregate imports, are landed in the Medina Estuary.

Heritage and Amenity:

Heritage:

PDZ1 stretches from Gurnard Luck in the west to the Norris Castle boundary in the east and extends down the Medina Estuary to the heart of the Island, encompassing a wealth of maritime history. There are 269 monument records, 60 Grade II listed buildings and 1 Grade II* listed buildings within the coastal zone. Overall the area has a long history connected to its maritime heritage with monument recordings going back many centuries. There are Conservation Areas in Cowes, East Cowes and Newport and areas of the defences including Cowes Parade seawall are of historic interest.

The Medina Estuary is a deep river valley which was flooded by sea level rise during the past 10,000 years. This is known as a ria estuary. There is a suite of terraces relating to the Pleistocene course of the River Medina. The nationally important Middle Palaeolithic site at Great Pan Farm is located on one of these terraces and there are potentially other, as yet unrecorded, Palaeolithic sites on the lower terraces nearer to the present river. The intertidal zone contains palaeo-environmental deposits both within and at the mouth of the estuary.

In the marine-scape is Cowes Roads, an area that has eight shipwrecks listed in the NMR, ranging from Post Medieval to 20th Century. There are an additional seven wrecks recorded along the frontage and just offshore lays the air wreck of a Junkers 88.

Amenity:
The coastal frontage and estuary consists of residential, commercial and port land uses. The area is of great economic importance to the Island supporting the marine service industry, two cross-Solent ferry ports, recreational sailing, major yachting events, some commercial fishing and the main industrial/commercial shipping port.

Equally important is the extremely successful tourism industry that this area supports, particularly with sailing events such as Cowes Week. Wide esplanades run along the developed frontage of Gurnard and Cowes, and at Gurnard and from Egypt Point into Cowes the coast is backed by the densely developed town with a popular extended town centre parade of shops and cafes. There is a sailing club in Gurnard and numerous sailing clubs in Cowes, often with private mooring facilities. There are areas of parking along the promenades and good pedestrian access to the coast along the seawalls fronting the outer Medina Estuary.

The Newport to Cowes cycle track runs along the western bank of the Medina Estuary. This is popular with recreational and commuting cyclists, which is a key element of sustainable transport planning. Socially, the Medina Estuary is popular with recreational sailors and many shore based activities including walking, angling, birdwatching and cycling as well as the provision of pontoons and moorings.

There is pedestrian and vehicle access to the waterside surrounding Newport Harbour, with the surroundings including an arts centre, public house, community centre and waterside footpaths and park areas.

East Cowes Esplanade runs along the outer estuary with areas of residential development, a paddling pool and play ground and other amenities such as public toilets and a kiosk café. The no-through access road runs along the esplanade, with a dinghy park, campsite/caravan site, tennis courts, car park and housing behind the road in the west of this unit. To the east, there is a wooded coastal slope behind the road, backed by agricultural land. The esplanade is popular with walkers and anglers.

Nature Conservation:
The western headland of PDZ1 is almost entirely built up, though Gurnard Bay is backed by woodland, scrub and grassland, with an area of low lying land flanking the Gurnard Luck stream. The East Cowes headland comprises of sandflats, with mudflats and seagrass beds at the mouth of the estuary, whilst the narrow Medina Estuary comprises mudflats and wetland habitats, such as saltmarsh and saline lagoons (although non-designated).

There are two international designated areas along the PDZ coastline. The Solent Maritime Special Area of Conservation (SAC) covers the entirety of this coastline, running from Sconce Point west of Yarmouth to the eastern end of Osborne Bay (covering 11,325ha). It is designated primarily for its estuaries and saltmarsh (*Spartina* swards and Atlantic salt meadows). South of the built up areas of Cowes and East Cowes, the Medina Estuary is designated as part of the Solent and Southampton SPA and Ramsar site and as a Site of Special Scientific Interest (the Medina Estuary SSSI). The SPA protects a number of internationally important wildfowl, wading and overwintering birds that use the estuarine mudflat areas for feeding. The SSSI has been designated to protect the saltmarsh, mudflat, freshwater marsh and ancient woodland that support these important birds, in particular the high tide roosts that are supported in the area.

1.2 Key Values

This area, particularly around the entrance to the Medina Estuary is one of the most intensively developed sections of the Island and one of the principal gateways to the Isle of Wight. This coastline has significant amenity, commercial and recreational value based on waterside access, forming one of the key economic hubs for the Isle of Wight, and there are redevelopment plans for areas of East Cowes and Cowes Harbour. Balancing the residential and commercial interests and natural environment of the Medina valley is a challenge to be addressed when seeking long term investment and sustainability for the Island.

The towns of Cowes and East Cowes have a unique and historic character around which has developed an internationally recognised reputation for water sport and recreational sailing. The historic environment and the landscape particularly of Cowes town centre adds considerably to this water-based use. Further within the Medina Estuary there is significant nature conservation value and over time this has become fully integrated with the local built environment as described above. At the southern extent of the Medina Estuary, the distinct waterside area of Newport is also of high value for supporting businesses and regeneration.

1.3 Objectives

Overarching objectives for PDZ1:

- To sustain and adapt the important centres of economic activity including the Cowes waterfront and gateways to the Island and the access and use of the Medina Estuary and Newport Harbour.
- To support adaptation of the town centres of Cowes, East Cowes and Newport quay to reduce flood risk.
- To support water use and navigation in the area, taking account of the internationally important water sport activities and ferry links to the island.
- To support adaptation of local communities at Gurnard Luck.
- To maintain important access along the seafront and shoreline use of the area.
- To support opportunity for adaptation supporting and enhancing the nature conservation value of the Medina.
- To sustain the historic landscape and environment where practicable.
- To maintain the important landscape subject to natural change.

1.4 Description

Above: *Coastal erosion and defence failure at Gurnard Luck, May 2009*

PDZ1 is a generally developed and defended along the coastline and within the mouth of the Medina Estuary, although much of the inner estuary remains undefended with scattered waterside developments becoming continuous approaching Newport Harbour.

In the west of the PDZ is the small community at Gurnard Luck, an area of improved residential and holiday dwellings located in the low-lying coastal zone with risks from both erosion and flooding.

Right: Cowes Esplanade, looking west towards the Medina Estuary (Isle of Wight Council).

Moving eastwards the centre of Gurnard and the towns of Cowes and East Cowes are both significant waterside communities, with important commuter links to the mainland and linked by a 'floating bridge' chain ferry, infrastructure at risk from coastal flooding and erosion. Behind the long seafront esplanade the coastal slopes underlying the residential area from Gurnard to Cowes are also at risk from underlying landslide phenomena with potential for reactivation by coastal erosion, exacerbated by water in the ground. Within the mouth of the Medina Estuary private properties, marinas, wharfs and businesses line the waterfronts. The coast is intensively used and many properties have their own slipways with a variety of defence types and heights with varying conditions.

There are narrow intertidal mudflats on either side of the middle and upper estuary, largely bordered by agricultural land and woods. At low water the Estuary is not navigable upstream of Island Harbour. Several waterside pubs and areas of moorings are popular with residents and visitors whilst Seaclose Park provides the venue of the internationally recognised Isle of Wight Festival. The Medina Valley Centre runs environmental education programmes and watersports courses. Commerical sites within the estuary use the waterside facilities for the import and export of materials and goods.

The upper estuary is surrounded by the developed area of Newport Harbour, close to the centre of Newport. Newport Harbour is characterised by moorings and pontoons surrounded by access roads, car parking and an area of waterside offices, amenity and commercial units, in an area of tidal flood risk.

East Cowes Esplanade runs along the outer eastern estuary with areas of residential development, and local amenities on the waterfront, with a no-through access road along the seawall.

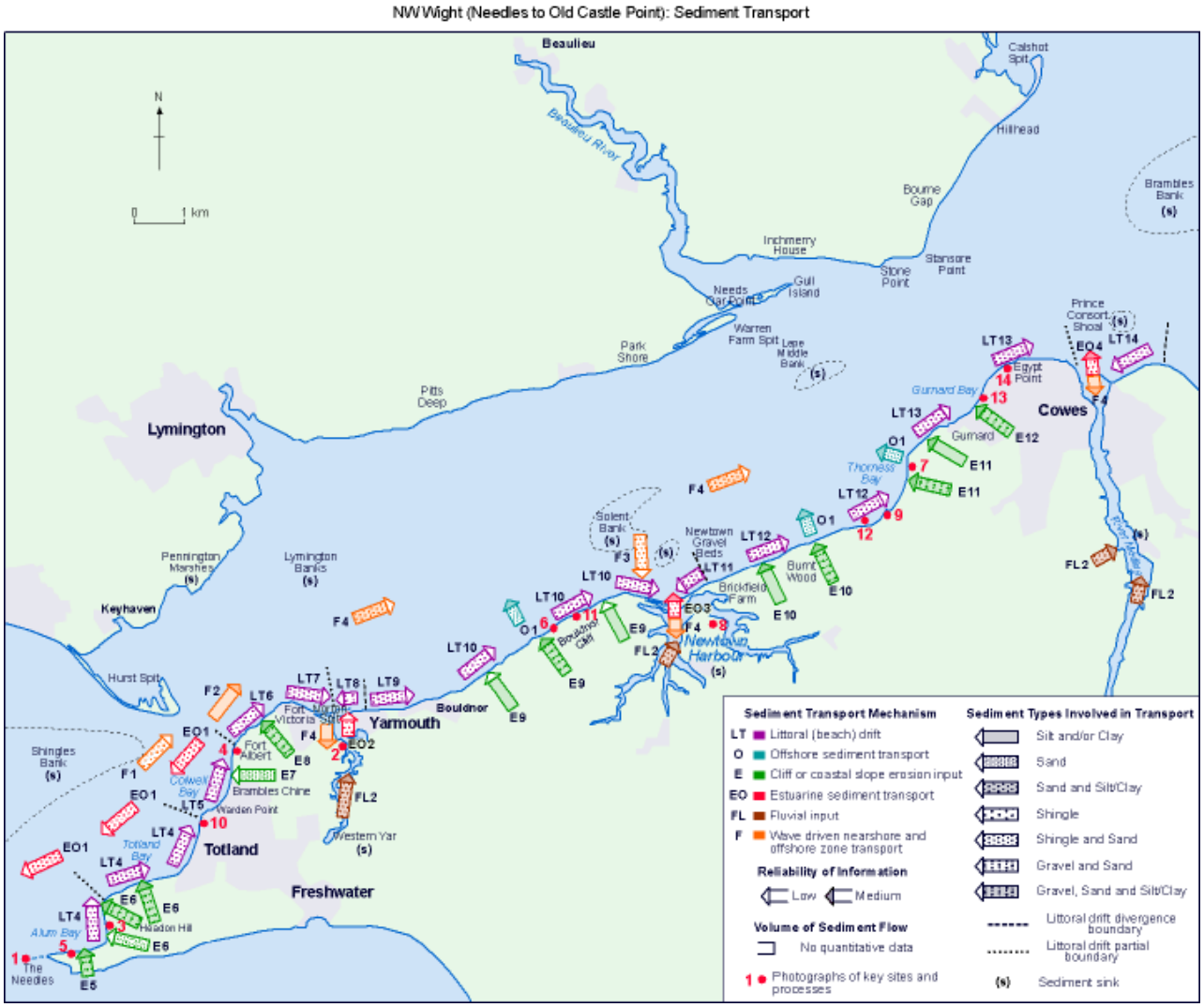
Above: The towns of Cowes and East Cowes at the mouth of the Medina Estuary, with the Shrape Breakwater protecting the entrance to the harbour (Isle of Wight Council).

Right: Flooding surrounding Newport Harbour, March 2008.

1.5 Physical Processes

1.5.1 Coastal Processes (further details are provided in Appendix C1).

The following summary outlines the wave climate, tidal flows, geomorphological controls, sediment supplies and coastal processes characterising PDZ1. The general pattern of sediment movement is summarised in the following diagram from the SCOPAC Sediment Transport Study.



Sediment transport sources, pathways and sinks on the north west coast, from SCOPAC Sediment Transport Study, 2004.

The small low-lying valley of Gurnard Luck at the western limit of the PDZ is fronted by a mixed gravel and pebble beach, and weak net eastwards littoral drift is reported along the depleted beach from Gurnard Bay around Egypt Point towards Cowes. Concrete rubble groynes at Egypt Point

selectively intercept sediments, but quantities are small because of the presence of protection structures and a lack of available material. Beaches comprise sandy gravels becoming coarse gravel and cobbles under the seawall and are depleted around Egypt Point, but widen eastwards to Cowes.

The north-facing coastal slopes extending under the towns of Cowes and Gurnard form a prominent headland separating the Medina Estuary from the Western Solent and are affected by significant slope stability and landslide problems. The nature of ground movement along this frontage is by:

i) subsurface movements associated with the progressive creep of deep-seated landslides;
ii) surface or superficial slope movements arising from the erosion or failure of steep slopes;
iii) the differential movement and settlement of clay slopes and compression or ground heave.

Contemporary problems arising from ground movement tend to result almost entirely from superficial movements, the nature and significance of which varies along the frontage. At Gurnard, the slopes were reactivated after the winter of 2001. At Gurnard Cliff, coastal mudslides have resulted in undermining and recession of the cliff top, active settlement of the cliffs and translational movement of debris to the foreshore. Outward displacement and heave of mudslide lobes at the base of the coastal cliffs has prompted the destruction of coastal defences along this section. Poor drainage, increased rainfall, beach steepening and increased toe erosion will promote active landsliding and could result in rapid retrogression upslope towards cliff top development. East of Gurnard slipway, the coastal slope becomes less steep and is protected at the toe by seawalls and an esplanade. Slope morphology comprises numerous irregularities, which indicate past and active seepage erosion and the presence of relic deepseated and shallow landslides. Between Egypt Point and West Cowes the upper coastal slopes exhibit evidence of instability, but the toe has been protected by an esplanade and sea wall since 1894, so no contemporary sediment supply occurs so long as it maintains its function. It should be noted that increases in winter rainfall (effective precipitation) that are likely to result from future climate change could have serious implications as it would raise groundwater levels, potentially causing more widespread reactivation of the coastal slope along this frontage.

The Medina Estuary is described in the Medina Estuary Management Plan as the product of the flooding of a pre-existing narrow, river eroded valley over the past 10,000 years. The estuary has been formed by the physical processes associated with the coast, the hydrography and hydraulic regime of the estuary and associated sediment transport or accretion. The estuary is tidal from Cowes to Newport. Cowes Harbour and the outer estuary are influenced by high energy conditions resulting from coastal waves, currents and the tidal regime, which declines rapidly inland. As hydraulic gradients weaken, sediment mobility diminishes and marine influences, in general, become weaker. As a result, over several millennia, there has been a net input of sediment into the estuary. The hydraulic regime of the Medina Estuary may be regarded as largely natural though modified in places due to waterfront development, the dredging of the main channel and the installation of protection structures. The estuary narrows at the Point where the floating bridge crosses and this constriction is considered to be a geological control on the estuary, such that the future evolution of the estuary will remain strongly influenced by this zone. Due to this it is argued that the 'true' estuary mouth is at this location and the areas to the north exhibit some characteristics of an open coast bay (ABPmer, 2007).

The Medina Estuary lies within a wide shallow valley with a gentle incline on either side. Sediment build up has formed characteristic mudflats which support a large number of species, including shellfish, algae and locally and regionally important species of worm, and also important sources of food for fish and bird populations. At low water a single, relatively wide but shallow channel remains. The mid and upper reaches are largely bordered by agricultural land, hedgerows and woods, whereas the lower reaches and mouth are lined by docks, boatyards and marinas. Along the estuary, minor relic industrial and agricultural defences have been constructed in the past, which in most cases they are no longer functioning, although they may provide some limited resistance to erosion.

The Medina operates as a natural littoral transport boundary as its dominant ebb tidal flow generates net offshore flushing of incoming shoreline sediments. The process is probably less significant than in the past because there is very little incoming littoral drift due to widespread shoreline stabilisation and drift interception. The flushing effect was enhanced by construction of the East Cowes (Shrape) breakwater in 1936/37 to limit the amount of suspended sediment entering the Estuary, and ebb tidal flow was shifted westward by the breakwater into the centre of the inlet. The flood currents dominate along the western margin. Comparisons of hydrographic charts dating back to 1856 indicate that some cyclic variations of the sea bed may have occurred prior to construction of the breakwater, but subsequently the bed has been relatively stable. This is attributable to the net offshore transport of sediment which maintains stable channel configurations and prevents siltation even in recently dredged berths. Small sand and gravel banks exist where dominant ebb and flood flows crossover; these are probably not sediment sinks but temporary accumulation zones for sediment subject to net offshore transport. Banks further offshore such as Prince Consort Shoal and Brambles Bank are probably permanent sediment sinks and in the past might have been supplied with sediments flushed seaward out of the Medina Estuary.

The SCOPAC Sediment Transport Study (2004) records that the Medina Estuary has a mean flow of $0.5m^{3}s^{-1}$ and this comprises only 0.67% of the tidal volume entering at the mouth during a corresponding tidal period. Thus, marine sediment input to estuarine mudflats and saltmarshes must be the dominant source of supply and fluvial sources are considered to be relatively insignificant. Historical chart analysis, a review of estuary processes and morphometric analysis on the estuary (ABPmer, 2007) suggests that accretion of fine material has continually occurred since 1856 (albeit at a relatively slow rate) but the man-made interventions, mostly between the 1920s and 1950s, probably caused a temporary change to the system. This changed the hydrodynamics, inducing additional flows at the lower states of the tides (particularly ebb) which have scoured the low water channel. This scour has mainly been at the edges, removing the finer fractions of sediments to leave the coarser gravels as bed armouring thus reducing the effect depth-wise. This temporary change appears to have worked through the system up to the area around Island Harbour and the net accretionary regime has re-established down estuary. The rates of future accumulation are, however, likely to be lower than those before the construction of the Shrape breakwater due to its effect on reducing the supply of sediment into the system. The Shrape breakwater has contributed (along with coastal protection works) to reduce the overall supply of sediment to the estuary, compared to 1856 but since the 1980s the estuary has had a net accretionary trend, particularly over the intertidal. Rates of change are small, being measured in millimetres per year. There has been a net reduction in surface area (at high water) due to coastal squeeze, predominantly from embankments and reclamation.

Since the 1940s the area of saltmarsh has reduced by 10.3 ha as a consequence of direct reclamation, capital dredging or impoundment such as at Island Harbour as well as from natural processes. A reduction in area of saltmarsh has occurred throughout the Solent Area and therefore a proportion of the natural change may reflect regional trends rather than local developments. The rate of erosion has slowed considerably in recent years. Upstream of Dodnor, the net accretionary trend has been continuous but may be reduced for a period in the future as the effects of the developments continues to work its way up the estuary, unless the effect has decayed sufficiently not to cause a significant change relative to the accretion and erosion thresholds.

At the eastern boundary of PDZ1 Old Castle Point is a drift divergence zone. The overall trend in PDZ2 to the east is for eastwards sediment drift over 10km from Old Castle Point towards Ryde Sands. Cowes Harbour entrance represents a drift convergence boundary and sediment movements affect the navigable channel, although relatively small quantities of sediment are moved by littoral transport towards the Medina entrance, and the Shrape breakwater further controls sediment input to the harbour channel. Some accretion against the eastern side of Shrape Breakwater (at the mouth of the Medina Estuary) since its construction in 1936/37 indicates a long-term trend for weak net westward littoral drift over the short distance of 1km from Old Castle Point. Similar accumulations against other smaller structures provide a corroboration of this drift

direction. Sand and shingle have accumulated on the upper foreshore with mud on the lower foreshore indicating that all grades of sediment are transported in the same direction. Falling beach levels and lack of significant accretion against the breakwater indicate low drift rates, due to the small source area and the impact of protection structures in reducing cliff erosion.

Unconstrained scenario:

The 'unconstrained' scenario provides a vision of how the coast could evolve if not controlled by man-made structures such as coastal defences. This is a key step in understanding the 'natural' response of the coast.

Without defences, the toes of the coastal slopes would be likely to be eroded at variable slow to moderate rates throughout the coastal areas of the PDZ dependent on the underlying landslide morphology and weak coastal slopes. This could remove support and destabilise the relic landslides on the slopes above along the Cowes-Gurnard frontage. The northern shore of the Isle of Wight is more sheltered than the south coast, however locally the frontage from Gurnard to the Royal Yacht Squadron is the most exposed to wave attack and also supports the steepest slopes, suggesting that it may be the most vulnerable to future re-activation.

An adequate supply of sediment is important to maintaining the wildlife habitats of the Medina Estuary and although past work has identified that the estuary may be 'sediment starved' the estuary appears to be capable of continuing to accrete fine sediments in the upper reaches which appears to be getting sandier. As a consequence there has been a change in the invertebrate fauna to reflect this and a change in the birds feeding there. The rate of saltmarsh erosion has slowed considerably in recent years. Since this is a valley type estuary with relatively steeply sloping margins the saltmarsh is likely to be sensitive to future sea-level rise and coastal squeeze unless vertical accretion can compensate.

1.5.2. Existing Defences

The following description of coastal defences outlines the current condition and expected remaining effective life of the defences in the area, if no further maintenance is carried out. In addition to the following summary, individual defences are described in Appendix C2 -Defence Appraisal (areas IW55 to IW59, & IW1).

In the west of the PDZ at Gurnard Luck defences are in place, with the exception of an undefended coastal slope 'Gurnard Cliffs'. These coastal defences fronting Marsh Road are in poor condition, and have locally failed causing active erosion. The freshwater outlet of Gurnard Luck incorporates tidal flap valves protecting Gurnard Marshes from flooding.

Defences extend from Gurnard eastwards to Cowes and the mouth of the Medina Estuary. As discussed earlier this defence line is primarily an ad-hoc series of both private and Environment Agency seawalls and provide only a moderate standard of protection (1 in 25). During periods of high spring tide/swell, areas of seawall backed by wide roads and parades are locally overtopped causing flooding. Active slope movement behind Egypt Esplanade periodically causes movement of the defences. A shingle ridge fronting Queens Road provides toe weight to the active coastal slope. The recently constructed Royal Yacht Squadron Jubilee Haven has improved the protection of The Parade from westerly storms. From the Parade to Cowes floating bridge consists of ad-hoc defence, mainly private, leisure and industrial marine infrastructure. The coastline from Cowes floating bridge to Medina Wharf is defended and fronted by sailing and industrial marine facilities and commercial wharf.

The central west side of the Medina Estuary is typically undefended until West Medina Mills Wharf which is currently being developed with the South East England Partnership Board. Upstream is a mix of undefended and sailing, residential and industrial defended frontages that includes the Vestas Marine Transfer Facility. This ajoins the undefended Medina Riverside Park. The frontage

then is defended until the boundaries of Newport Harbour, with harbour-side walls surrounding the tidal harbour. The central east side of the Medina Estuary is typically undefended, with the exception of Island Harbour marina that incorporates a tidal lock, and limited defences near the Folly Inn. Historically, enclosure of tidal inlets in the Medina has occurred as a result of tidal millponds at Island Harbour and Dodnor Creek and from the construction of the former railway on the western bank (now forming the cycle track). Some structures survive, mostly in a deteriorating condition, which may impede natural tidal inundation.

Moving north into East Cowes, the north east side of the Medina Estuary from Kingston Wharf to the north consists of private, leisure, and industrial related defences and infrastructure.

At the eastern shore of the estuary mouth, from the Cowes floating bridge to the Shrape Breakwater consists of private defended frontages and slipways including the car ferry terminal, then public defences with a seawall and number of concrete groynes between Venture Quays and Old Castle Point. SEEDA recently improved the commercial facilities of Venture Quays by installing steel sheet piling and rock armour revetment. East Cowes suffers from localised flooding during periods of high spring tides/swell. The South East England Partnership Board and Cowes Harbour Commission are investigating construction of an outer breakwater and additional marina facilities. Outside the Shrape Breakwater (currently forming the harbour limit) defences extend eastwards to Old Castle Point protecting the coastal slope from erosion.

1.5.3 Potential Baseline Erosion Rates

The SMP reviewed a wide range of data to define the current and potential rates of coastal erosion and cliff retreat along the Isle of Wight coast using the best available information. Full details can be found in Appendix C3. Future erosion rates are predicted using Walkden & Dickson formula (2008) and allow for future sea level rise – the full methodology is explained in the Appendix. Predicted sea level rise rates of 4mm/yr (to 2025), 8.5mm/yr (to 2055), 12mm/yr (to 2085) then 15mm/yr (to 2105) have been used, in accordance with SMP national guidance by Defra. These rates equate to 7cm of sea level rise (above the 2009 baseline) by 2025, 32cm by 2055 and 98cm by 2105. The IW numbering units refer to lengths of coast for which future behaviour is described and mapped in Appendix C based on SMP1 and Strategies. These are not SMP2 policy units which are developed in section 3 below.

Potential total erosion over the next 100 years is shown, however it is important to note that this is an estimate that is based on an undefended coastline. Within Appendix C3, these erosion rates are only applied following the predicted failure date of each individual element of the defences within the unit; therefore the resulting erosion amounts shown in the Appendix C3 tables and maps (and used in the development of this SMP) will show smaller erosion totals than the overview provided below.

Potential coastal erosion rates (all figures in metres/year):-

Numbering in SMP2 Appendices (2010) *(area and name, clockwise)*		Historical Rate	Current to 2025	2025 to 2055	2055 to 2085	2085 to 2105	Potential 100 year erosion (if undefended) -total in metres	Notes
IW55	**Gurnard Luck**	0.30	0.35	0.46	0.53	0.58	48	
IW56	**Gurnard & Cowes Esplanade**	0.30	0.35	0.46	0.53	0.58	48	Coastal erosion could trigger potential landslide reactivation (approx. 2m/yr slope retreat); see Appendix C3 for details of the zone at risk.
IW57	**Cowes Parade & Harbour**	0.30	0.35	0.46	0.53	0.58	48	
IW58	**Medina Estuary**	0.10	0.12	0.15	0.18	0.19	16	
IW59	**East Cowes Outer Harbour**	0.10	0.12	0.15	0.18	0.19	16	

Numbering in SMP2 Appendices (2010) *(area and name, clockwise)*		NE Strategy Study Morphodynamic Unit No.	Current to 2055	2055 to 2085	2085 to 2105	Potential 100 year erosion (if undefended)	Plus potential slope reactivation triggered by coastal erosion
1	**East Cowes Esplanade**	1	0.26	0.31	0.34	29	n/a
		2	0.26	0.31	0.34	29	Plus 65m potential slope reactivation at end of epoch 1

Note:
i) Erosion rates have been determined from monitoring data and examination of historical records and have been calculated to take account of sea level rise. –see Appendix C3 for details.
ii) The IW numbering units refer to lengths of coast described in Appendix C. These are not SMP2 policy units.

2. Baseline management scenarios

2.1 Present Management

Present management of the shoreline is taken as the policy defined by SMP1, modified by subsequent strategies or studies. It should be noted that in the case of SMP1 the period over which the assessment was carried out was 50 years. SMP2 extends this to an assessment period to 100 years. The table below sets out the current shoreline management policies for PDZ1. This SMP2 will assess all the available evidence and update these previous management policies.

The key documents outlining the present management of the shoreline in this PDZ are:-

Isle of Wight Shoreline Management Plan 1 (1997)
The first Shoreline Management Plan (SMP1) for the Isle of Wight 's coast was published in 1997. It consists of two volumes.

- Volume 1 is the 'Data Collection and Objective Setting', which presents information on a range of topics including coastal processes, natural environment, etc.
- Volume 2 is the 'Management Strategy', which presents information for each Management Unit around the Island's coast and sets a management Policy for each unit.

Coastal Defence Strategy Studies, Isle of Wight
Whilst the Shoreline Management Plan provides the risk framework for management of the coast, Coastal Defence Strategy Studies provide a more detailed assessment of particular frontages in order to identify the most suitable type of coastal defence schemes that may be required to fulfil the agreed shoreline management policy and to plan a programme of future works.

North East Coastal Defence Strategy Study, Isle of Wight (2004)
The North-East Coastal Defence Strategy Study, which extends from the Shrape Breakwater at East Cowes to Culver Cliff, was completed in 2004 and adopted in 2005. The Plan sets out the works programme along the north-east coast frontage for the next five years including details on costings. The North-East Strategy consists of a summary report and detailed Appendices.

West Wight Coastal Flood and Erosion Risk Management Strategy (2016)
A Coastal Strategy for the West Wight coastline from Freshwater to East Cowes was completed following the publication of the SMP2. This contains further detail and is available at www.iow.gov.uk.

Catchment Flood Management Plan
The Environment Agency has undertaken a programme of Catchment Flood Management Plans (CFMPs) for the major river catchments in the Southern Region. A CFMP is a large scale plan that covers an entire river catchment or group of catchments that identifies long-term, sustainable policies to manage flood risk within the catchment. These policies form the basis for development of Strategy Plans, covering all or part of the overall catchment area, which will identify in more detail appropriate flood defence measures.

Whilst CFMPs principally address fluvial (river) flooding, SMPs address tidal (sea) flooding, alongside coastal erosion. The Isle of Wight Catchment Flood Management Plan (Summary Report) was published in December 2009.

- Sub Area 3: Lower River Medina and Gurnard Luck

"The issues in this sub-area: The River Medina and Gurnard Luck can flood from a number of causes. Both rivers are responsive to rainfall and both are affected by tide locking. Potential flood levels at Newport and Gurnard are particularly sensitive to future sea level rise due to a number of low lying properties. The scale of flood risk in this subarea is such that estimated property damages are relatively

high in comparison to other parts of the catchment because of the significant population in the catchment. The relatively high number of properties at risk means that flood risk management activities are employed and existing defences which protect Newport and Gurnard need to be maintained."

Policy Option 4 – areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

Medina Estuary Management Plan

The Medina Estuary Management Plan was written in 1997 and revised in 2000. It sets out key issues, policies and actions that contribute to the integrated management of the area and highlight the need for the sustainable use of the estuary's resources. Key Issues for the estuary addressed in the Management Plan are: Agriculture, Commercial and Economic Use, Fisheries, Historical and Cultural Resources, Landscape, Nature Conservation, Physical Processes, Recreation and Leisure, Water Management, Public Awareness and Education, Research and Monitoring.

The Physical Processes theme includes the following objective:

- Objective P2: To ensure the co-ordination of appropriate coastal protection and flood relief.

The previous shoreline management policies set for this PDZ are listed in the table below:

The IW numbering units refer to lengths of coast for which previous shoreline management policies have been set in SMP1 modified by subsequent Strategy Studies. These are not SMP2 policy units, which are developed in section 3 below.

Numbering in SMP2 Appendices (2010)		**SMP1 (1997)**		**North East Coastal Defence Strategy Study (2004)**		
Area *(clockwise)*	**Name**	**Unit**	**Policy**	**Strategic Management Unit**	**Preferred Generic Policy Option**	**Trigger Governing Change in Generic Policy Option**
IW55	**Gurnard Luck**	NEW 11	Hold the existing defence line	N/A		
IW56	**Gurnard & Cowes Esplanade**	NEW 12	Hold the existing defence line			
		NEW13	Hold the existing defence line *Or* Advance the existing defence line			
IW57	**Cowes Parade & Harbour**	NEW 14 (includes both east & west banks of the estuary mouth)	Hold the existing defence line *Or* Advance the existing defence line			
IW58	**Medina Estuary**	N/A	-			
IW59	**East Cowes Outer Harbour**	NEW 14 (includes both east & west banks of the estuary mouth)	Hold the existing defence line *Or* Advance the existing defence line			
IW1	**East Cowes Esplanade**	NEW15	Hold the existing defence line *Or* Retreat the existing defence line	SMU1	Hold the Line, followed by No Active Intervention, but Monitor	Economic viability of maintaining existing defences.

2.2 Baseline Scenarios for the Policy Development Zone

2.2.1 No Active Intervention (Scenario 1, NAI):

Under this scenario no further work would be undertaken to maintain defences. Where defences fail they would not be repaired. The principal difference between this scenario and the unconstrained scenario discussed earlier is the residual impact existing defences would have on the behaviour of the coast. A detailed description of this NAI scenario is given in Appendix C3, area by area. The following discussion provides a summary, drawing together an overview with particular focus on how the use of the coast would be affected. In particular, this baseline scenario is discussed with respect to the overarching objectives set out previously in sub-section 1.3 of this PDZ1.

Gurnard Luck
Gurnard Luck is a low lying community surrounding Gurnard Luck stream. From Gurnard Luck the village of Gurnard continues along the cliff top to the east and central Gurnard forms the seafront at the western end of the Cowes-Gurnard seawall. At Gurnard Luck sections of the defences are already failing. Under this scenario, there would be no future maintenance works so erosion of the low-lying coastal frontage will continue and tidal inundation would occur more frequently and at higher levels with sea level rise. Inland of these processes, Gurnard Luck stream flows through flapped culverts before exiting to the sea. The Luck can only drain during low tide conditions, and excess waters overflow into the Marsh area. The Marsh quickly fills during fluvial events and with no maintenance and failure of the gates, Gurnard Luck stream will divert and flow over Marsh Road, flooding Marsh Road properties. This suggests that within the first epoch the village of Gurnard would be exposed to a number of threats simultaneously; increased sea flooding and increased erosion of coastal land and fluvial flooding. The village would struggle to co-exist with these natural processes and once started these processes would likely accelerate deterioration and collapse of the defences. The collapse of the defences and flooding of the Marsh area would result in the creation of intertidal mudflat and saltmarsh in the medium to long term, as the coastal grazing marshes become more brackish and erode to more sustainable intertidal mudflats and saltmarsh areas.

Gurnard to Cowes Esplanade
At Gurnard Cliff, the wooded and developed coastal slope is undefended for approximately. 0.5km, then moving eastwards from central Gurnard around Egypt Point and eastwards into Cowes a continuous series of concrete seawalls extend for over 2km and beyond and are expected to fail near the end of the first epoch. The cliff and seawall are backed by the urban residential areas of Gurnard and Cowes on marginally stable slopes, which will be at risk of initial erosion leading to a significant landslide reactivation. Coastal erosion at the toe of the coastal slope could trigger landslide reactivation at 2m/year. Therefore, a wider potential reactivation zone is shown on the maps of the 'No Active Intervention' scenario beyond the direct zone of expected erosion. Additionally, the esplanade road from Gurnard to Cowes will be increasingly affected by episodes of tidal inundation through the first epoch prior to seawall failure. The public highway, residential properties, footpath access and public open space will be affected in this area.

Cowes, East Cowes and the Medina Estuary
The frontage at Cowes Parade begins a defended section close to 3km in length fronting Cowes town centre and lining the mouth of the Medina Estuary. Under this scenario no works would be taken to maintain the existing assortment of concrete and masonry seawalls and steel sheet pile defences. The patchwork but continuous defence line is inadequate to prevent tidal flooding, which already affects the town centre of Cowes and over time sections of the frontage would give way. Lining the outer Medina Estuary, the low-lying coastal land is heavily developed with a combination of residential, commercial and industrial properties including wharfs, large marinas and associated facilities essential to the marine industries of the town. The central undeveloped reaches of the estuary are generally undefended, whilst the remaining sections are characterised by an assortment of landowner maintained defences. These sections of defences, varying in size,

height and material, provide protection from flooding or essential waterside access whilst helping to maintain the channel to allow commercial operation of the harbour and estuary. In the first epoch, there are a large number of properties on Cowes High Street south of the Parade and the shoreline assets running along to the floating bridge and to the southern limit of Cowes at risk, which includes a number of historic listed buildings. Moving towards the third epoch, with sea level rises, both East Cowes and Cowes town centres will experience flooding on most tides. The central sections of the estuary will evolve more naturally, though there is a waterside development area and a marina present, which will impede natural change along limited frontages during the first epoch prior to defence deterioration and failure (if unmaintained under the No Active Intervention scenario), followed by potential inundation or loss of properties. The popular West Cowes to Newport cycle track is also at risk, an important element of sustainable transport planning. Loss of the defences surrounding the Folly Inn would result in the loss of a local amenity and tourism focus for the estuary waterside. Elsewhere in West Cowes, East Cowes and the Medina the failure of defences and wharfside walls would severely impact upon the commercial operation of the estuary, including marine industry and aggregate imports. Natural change may involve loss and change of important intertidal habitats (i.e. erosion of saltmarsh to mudflats), particularly around the estuary mouth and some areas of the central estuary, since natural roll-back would be constrained naturally by height of the land, leading to more frequent saline intrusion of reedbeds and loss of mudflats. However, through the No Active Intervention policy option there are opportunities to allow the estuary to evolve more naturally, for example, near Dodnor Cottages, around Blackbush Copses and to create habitat from the south of Somerton Farm to Little Werrar Wood.

At the southern limit of the Medina Estuary, around Newport Harbour and Little London approximately 750m of both banks are protected by masonry and concrete seawalls and steel sheet piles. With no maintenance these defences are expected to fail late in the first epoch or very early in the second epoch affecting property, a number of listed buildings and infrastructure. The failure of defences would only allow for marginal roll-back of the intertidal habitats due to the relatively steep topography of the river.

On the eastern shore of the Medina Estuary mouth, the shoreline defences around the town of East Cowes tend to be low concrete and masonry walls, similar to Cowes Parade and Harbour. This urban area is at risk principally from significant coastal flooding and overtopping, both situations already occurring, and with no further intervention or maintenance the defence structures in the north and south of the frontage will breach at the end of the first epoch. A dominant feature along this frontage is the Shrape Breakwater forming the outer limit of the large harbour and the failure or breach of the structure with no maintenance would lead to a number of issues. Specifically this would include increased quantities of sediment to drift westwards and possibly impede navigation in Cowes Harbour and increased wave penetration into the estuary/wave attack to the frontage. This change in the estuary mouth would alter the tidal flow through the harbour entrance. Further eastwards, loss of the seawall leading to Old Castle Point will trigger erosion resulting in localised slope reactivation. However the impacts along this frontage are limited to an Esplanade road backed by grassy public open space with scattered buildings, decreasing eastwards moving into thickly wooded coastal slopes that form part of the historic Norris Castle park and gardens, although this Esplanade (inside and outside the Shrape breakwater) forms the main waterfront access within East Cowes. The degradation of defences would allow the coast to eventually roll-back naturally, providing beach material.

Overview of Impacts

There remains uncertainty as to the degree of slope reactivation around the future headlands and the re-established natural estuary behaviour under this scenario given the complexities of the surrounding frontage. However, the important conclusion is that there would be substantial change to the area leading to a significant impact on the use of the harbour and shoreline. NAI in this area would not sustain or allow adaptation of the communities and local commercial interests. It would also not significantly enhance the existing nature conservation values of the Solent and Southampton Water SPA and Ramsar sites, the Solent Maritime SAC and the Medina Estuary SSSI (features including intertidal sandflats and mudflats, salt marshes, coastal grazing marsh and

important wader roost sites), due to the combination of increased erosion, sea level rise and the naturally steep topography of much of the estuary constraining natural roll back of the coastline. Due also to the increased flood risk both at the estuary mouth and along the estuary, there would be significant disruption to the economic drivers supporting to the urban areas of Cowes, East Cowes and some disruption to Newport, affecting marine industry and commercial wharfs. Most notably vital ferry transport links would be lost in both Cowes and East Cowes. Arguably the landscape, though changed, would still be much valued, but there would be loss to the historic environment. Access to the shoreline would be affected, including loss of the popular seafront promenades, but most significantly the future use of the Harbour, without some form of intervention and control, would be difficult.

2.2.2. With Present Management (Scenario 2, WPM):

Overview
This scenario examines the effectiveness of maintaining and continuing existing coastal defence structures and policies within the PDZ. This present management scenario is based on that set by SMP1 and updated in limited areas through the development of the published North East Coastal Defence Strategy Study**.** These policies are outlined in the table in section 2.1 above and are used to describe the intent of WPM within this baseline scenario. In summary the intent defined by the existing management policies is to provide continued protection to all existing areas currently defended, or possibly advance the existing defence line at Gurnard, Cowes and East Cowes if the opportunity arose related to shorefront development. To the east of East Cowes there is a management intent to hold existing defence line in the short term and then move to no active intervention.

The Medina Estuary was excluded from SMP1 and the Catchment Flood Management Plans (CFMPs) only included the river upstream of the A3020 road bridge at Newport Harbour, marking the main transition from tidal to fluvial dominated processes. The Medina Estuary Management Plan was revised in 2000 and set out key issues, policies and actions that contribute to the integrated management of the area and highlight the need for the sustainable use of the estuary's resources. One of the main objectives was to ensure the co-ordination of appropriate coastal protection and flood relief.

In 2005 a three year project began to develop a set of assessment tools for the Medina Estuary. The aim of the project was to improve the understanding of the estuary and its processes and to develop a hydrodynamic model that would help the statutory authorities with their assessments of proposed coastal developments. As the Medina had become a focus for the regeneration of East Cowes and the Isle of Wight, it was felt that the assessment of individual applications may not reflect the combined impact of small developments on the European designated sites (i.e. Solent Maritime SAC and Solent and Southampton Water SPA and Ramsar sites). The research undertaken since 2004 was therefore carried out in the context of development proposals for the regeneration of the East Cowes area and its potential impact on these designated sites. The research and reports produced for the project contain information that significantly increases the level of understanding of the estuary and provides the tools to assist with the assessment of any new structure or development.

Gurnard Luck
At Gurnard the existing defence line would be maintained and replaced as required. This continued maintenance will prevent further breach and erosion of the frontage, but the existing defence level is not high enough to prevent overtopping and tidal flooding. The community, even with current management, is at high risk. Over the first epoch, the foreshore is expected to narrow as sea level rise reduces the beach area available, as well as being starved of local sediment supply, which will impact on the amenity use of the frontage. Limited sediment supply from PDZ7 to the east is likely to continue. Holding the existing line at Gurnard is achievable, but heights of defences would need to be increased against current and future flood risk combined with sea level

rise. The 'with present management' scenario is not adequate to project the community much past the first epoch. The landward coastal grazing marshes would be maintained under this management option, though there would coastal squeeze of the beach as it was constrained from natural roll back by the maintained defences. However, the beach is of poor sediment and ecological quality and would therefore not significantly affect the integrity of the Solent Maritime SAC.

Gurnard to Cowes Esplanade

At Gurnard Cliff, the coastal slope would remain undefended and eroding at the cliff toe so within the first epoch significant slope reactivation and retreat would continue to be triggered in line with the 'No Active Intervention' scenario, with cliff toe erosion and retreat outflanking the adjacent defences at Gurnard Luck to the west and Gurnard Bay to the east. It would be important to link any potential works at Gurnard with the erosion issues along this section. From central Gurnard to Cowes the existing coast protection would be sustained by maintaining and replacing the existing seawalls at their current standard. Under the current management intent, with ongoing maintenance, the existing seawalls are not high enough to protect against very frequent and serious overtopping that will occur towards the end of the second epoch so their levels will need to be raised. These events could otherwise inundate roads and infrastructure along the frontage (seafront properties between Queens Road and the Esplanade) and may also assist in saturating and destabilising the coastal slopes at risk of landslide reactivation. Slope failure underlying the developed areas could be triggered by high groundwater levels as ground conditions worsen with predicted increases in winter rainfall despite maintaining the sea wall. Maintenance of the seawalls will however significantly reduce the risk of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining. By maintaining the existing defences the foreshore will steepen over time with erosion and sea level rise, with coastal squeeze of the coarse shingle frontage. The relatively poor ecological condition of the beach means there would be very no significant effect on the integrity of the Solent Maritime SAC.

Cowes

The management intent over this section is based on holding the existing defence line, but this is difficult with increasing sea level rise. To protect Cowes, and deliver the management plan, one would need to build a high defence wall around Cowes or move Cowes town centre to higher ground. Piecemeal raising of the levels of existing private defences by individuals is likely to be insufficient to reduce flood risk in the town centre. Preliminary investigations into 'advancing the line' along small sections have been discussed, but there has been some resistance from landowners who are concerned about losing direct access to the shoreline. Working with the Isle of Wight 'Island Plan' (LDF) the management intent at Cowes, and East Cowes discussed later, needs to be influenced by the long term vision of this area within the technical constraints. With the present management there would continue to be significant flood risk, and some limited bank erosion to approximately 1.5km of commercial, residential and historically important properties along the Medina fronting Cowes and East Cowes, just upstream of the floating bridge. Maintaining the existing defences would over time lead to the loss of the small pockets of intertidal mudflats through coastal squeeze. Some of these mudflats are in poor condition and some designated as Biodiversity Action Plan (BAP) habitats and a feature of the Solent Maritime SAC.

Medina Estuary

Along the Medina Estuary, continued maintenance of the defences at Cowes, East Cowes, limited sections of the central estuary (including Island Harbour) and at Newport Harbour will hold the shoreline in its present position. Additionally this will help support the borders of the estuary, maintaining commercial harbours, wharfs and operations at Cowes, East Cowes and Newport. While the majority of the central estuary will remain undefended, maintaining the fixed location of the mouth may affect the natural functioning of the estuary, which is a feature of the Solent Maritime SAC. Upstream of Cowes there is also flood risk at Folly Lane, Island Harbour, Stag Lane and to a number of commercial and residential properties surrounding Little London and Newport Harbour. Similar to the issues facing the rest of this PDZ, the impacts of sea level rise will

result in increased tidal flood frequency and increasing depth of tidal flooding. Regular inundation of significant areas of Cowes, East Cowes, waterside developments along the estuary margins, Island Harbour and Newport Harbour is likely as the majority of defence levels are likely to be insufficient as they were not designed to protect against the prevailing conditions on a 50-100 year timescale nor do they provide a continuous defence line. Where the defences are maintained to protect properties and assets there will be loss of important estuarine habitats through coastal squeeze, this will affect the integrity of the SAC, SPA, Ramsar and SSSI within the estuary. However, where the defences are allowed to fail since they are not designed to prevail over the 100 year period there is the potential for habitat gain through natural roll back and for the estuary to function more sustainably.

East Cowes

As discussed throughout the management of this PDZ, continuing the maintenance of the existing sea walls and private defences without improving the current standard of protection will prevent shoreline change due to erosion but will not reduce the current and future levels of flood risk. Tidal inundation already encroaches into the developed area and the flood risk zone will expand in future epochs and the area will be at high flood risk. While keeping the shoreline in the current alignment will preserve the harbour channel entrance, the economic implications to local businesses and the cross-Solent ferry links could be significant (possible abandonment of key areas) and significant upgrading of defences will be required. Maintaining the existing defences would protect the few historic buildings from erosion, though potentially not from flooding, as well as the Norris Castle park and gardens from being eroded away. However, the intertidal mudflat and sandflat areas fronting these defences would become increasingly affected by coastal squeeze, thus affecting the integrity of the relevant European designated sites.

Overview of Impacts

The potential economic damages under this scenario are identified in Table 1 at the end of this sub-section.

The intent of the scenario is to reduce the frequency and extent of tidal flooding at Gurnard Luck and prevent erosion to reduce the risk of landslide reactivation from Gurnard to Cowes. It is important to consider that the risks along these frontages cannot be viewed independently as the combination of increased overtopping, tidal flooding and wave attack will increase the pressure to the cliff toe potentially leading to landsliding, therefore the standard of defences needs to be improved. One could not undertake substantial works to stabilise the coastal slope, either through drainage and direct slope stability techniques, without also doing works to the defence line against tidal flooding and erosion. Defences at the community of Gurnard Luck will become increasingly difficult to maintain as their short to medium term sustainability is questionable, particularly with the potential for habitat creation landward of Marsh Road to mitigate/compensate for the loss of coastal habitats elsewhere on the island, however, there is a strong small community in this area. Also long-term defence of the Cowes and East Cowes seafront will become increasingly difficult with sea level rise. In the areas with wide esplanades there is room to increase the standard of defences, but within the estuary mouth properties directly front the waterline on both sides of the estuary. As such, the objective of ‘managing risk to properties where sustainable’ is only considered to be partially addressed.

While the towns of Cowes and East Cowes can be maintained, the use and appearance of the seafront would be significantly altered through increasing levels of defence.

There is a potential loss of mudflats, saltmarsh and coastal grazing marsh areas along the Medina Estuary as flood defences are maintained, which will affect the integrity of the European designated sites. Alternatively, in undefended areas where tidal flooding is allowed, important habitats will be lost or altered. This may constrain an adaptive approach to management of this feature. WPM will also affect archaeological and palaeo-environmental sites within the Medina Estuary.

Table 1a. Economic Assessment – Erosion damages

The following table provides a brief summary of 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			
No Active Intervention	**Number of properties:**		**Value**	**Number of properties:**		**Value**	**Number of properties:**		**Value**	**PV Damages**
Location	*Residential*	*Commercial*	**x £1000**	*Residential*	*Commercial*	**x £1000**	*Residential*	*Commercial*	**x £1000**	**(£x1000)**
Gurnard Luck	0	0	0	5	3	919	26	8	4,678	948
Gurnard Cliff	0	0	0	0	0	0	2	2	404	53
Gurnard to Cowes Esplanade	0	6	0	1	10	360	117	29	20,856	2,076
Central Cowes	0	27	585	18	34	3,720	75	71	20,407	4,009
East Cowes	0	18	0	0	2	60	3	11	1,533	145
East Cowes Outer Esplanade	1	5	73	0	0	0	0	0	0	73
									Total for PDZ1	**7,303**
With Present Management	**Number of properties**		**Value**	**Number of properties**		**Value**	**Number of properties**		**Value**	**PV Damages**
Location	*Residential*	*Commercial*	**x £1000**	*Residential*	*Commercial*	**x £1000**	*Residential*	*Commercial*	**x £1000**	**(£x1000)**
Gurnard Luck	0	0	0	1	0	172	0	1	30	49
Gurnard Cliff	0	0	0	0	0	0	2	2	404	53
Gurnard to Cowes Esplanade	0	0	0	0	0	0	0	0	0	0
Central Cowes	0	0	0	0	0	0	0	0	0	0
East Cowes	0	0	0	0	0	0	0	0	0	0
East Cowes Outer Esplanade	0	0	0	0	0	0	0	0	0	0
									Total for PDZ1	**102**

Notes

No Erosion Damages for MA1B as it lies completely within the Medina Estuary

Table 1b. Economic Assessment – Flood damages

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			
No Active Intervention	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**Number of properties**		**AAD**	**PVD**
Location	< 1:100yr	>1:100yr	**x £1000**	< 1:100yr	>1:100yr	**x £1000**	< 1:100yr	>1:100yr	**x £1000**	**(£x1000)**
Gurnard and Gurnard Luck (A, B1&2)	62	7	147	73	3	193	79	6	278	5,214
Egypt Promenade (B3)	9	10	35	19	4	61	26	3	103	1,486
Cowes (C1, 2 & 3)	413	156	9,774	597	52	18,609	708	30	38,656	460,694
Cowes East (E)	272	27	7,566	303	52	13,829	470	31	27,896	345,228
Central Medina (D1 & 3)	53	6	708	59	15	1,349	83	8	2,962	41,654
Newport (D2)	52	16	571	68	0	1,293	68	0	2,773	30,330
Agricultural Total			12.05			14.77			18.99	407
									Total for PDZ1	885,013

	Flood risk tidal 2010			Flood risk tidal 2060			Flood risk tidal 2110			
With Present Management	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**No. of properties**		**AAD**	**PVD**
Location	< 1:100yr	>1:100yr	**x £1000**	< 1:100yr	>1:100yr	**x £1000**	< 1:100yr	>1:100yr	**x £1000**	**(£x1000)**
Gurnard and Gurnard Luck (A, B1&2)	62	7	147	73	3	193	79	6	57	4,518
Egypt Promenade (B3)	9	10	35	19	4	61	26	3	23	1,232
Cowes (C1, 2 & 3)	413	156	193	597	52	304	708	30	449	7,552
Cowes East (E)	272	27	142	303	52	207	470	31	368	5,531
Central Medina (D1 & 3)	53	6	708	59	15	186	83	8	82	14,711
Newport (D2)	52	16	571	68	0	193	68	0	64	12,219
Agricultural Total			12.45			15.23			19.54	419
									Total for PDZ1	46,182

Table 2. General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives agreed by stakeholders. These 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
To sustain and adapt the important centres of economic activity including the Cowes waterfront and gateways to the island and the access and use of the Medina Estuary and Newport Harbour.						
To support adaptation of the town centres of Cowes, East Cowes and Newport quay to reduce flood risk.						
To support water use and navigation in the area, taking account of the internationally important water sport activities and ferry links to the island.						
To support adaptation of local communities at Gurnard.						
To maintain important access along the seafront and shoreline use of the area.						
To support opportunity for adaptation supporting and enhancing the nature conservation value of the Medina.						
To sustain the historic landscape and environment						
To maintain the important landscape.						

3. Discussion and detailed policy development

The overview and discussion provided above of the two baseline scenarios highlight the existence of major flood, erosion and landsliding risks to the economic future of the towns of Cowes and East Cowes including risks to key ferry transport links and commercial sites that benefit the whole Isle of Wight. These are key drivers for policy development and continued management must aim not only to address these risks but to do so in such a manner as to allow the sustainable use and development of the area.

It also demonstrates the importance of the natural behaviour and constraints governing the use and future of the Medina Estuary. The economic drivers of the area need to balance with sustaining and enhancing the natural and historic environmental values.

The overall conclusions that may be drawn are that a policy of 'No Active Intervention' (scenario 1) fails to address the substantial threat to the economic, navigational and heritage value of the area, and does not assist adaptation of the town centres and seafront communities. The NAI scenario could deliver some benefits for the natural environment, but does not deliver a balanced sustainability of values. The scenario of continuing 'With Present Management' (scenario 2) demonstrates the viability of maintaining defences to reduce slope stability issues in Cowes to Gurnard, but is likely to be insufficient to address the increasing scale of flood risks to the intensively developed waterfronts and town centres of Cowes and East Cowes and the community of Gurnard Luck. The WPM scenario delivers benefits for the important water use and navigation in the area, for potential adaptation of the nature conservation interest of the Medina and maintains the important landscapes, but long term adaptation of the communities needs to be addressed.

PDZ1 is set to benefit from the Cowes Waterfront Initiative, which is a holistic regeneration project for the whole of the Medina valley, including potential expansion of the outer harbour. It is intended to create jobs, attract investment and bring new facilities to the communities of Cowes, East Cowes and Newport Harbour. The initiative is being promoted by a collaboration of the Isle of Wight Council, the Isle of Wight Economic Partnership and the South East England Partnership Board.

Gurnard Luck

The NAI scenario places the community at Gurnard Luck at risk from multiple risks (erosion, tidal flooding and fluvial flooding). This would result in significant loss of residential properties. Past management of this area has been in the form of hard defences. The SMP1 policy in this area was to hold the existing defence line, however maintaining the current failing coastal defences under a policy of WPM would prevent further breaches and prevent coastal erosion, but would not address all the risks in the area. Improvement or extension of the current defence line would need to also address the incursion of tidal flooding and fluvial flooding centred around Gurnard Luck stream which runs through the area and there is potential for realignment. Raising the heights of defences would delay the commencement of serious tidal flooding, but risk levels will continue to increase with future sea level rise of approximately 1m over the next 100 years. Raising defence levels is not sustainable in the longer term and adaptation of the community needs to be addressed. Homeowners in the area have begun to adapt to increasing risks of flooding by raising the level of properties. The impact of continuing erosion causing increasing slope reactivation on adjacent frontages either side of the Gurnard Luck valley also needs to be taken into account in the future management of this area, although some limited additional sediments may be supplied from the west as cliffs reactivate.

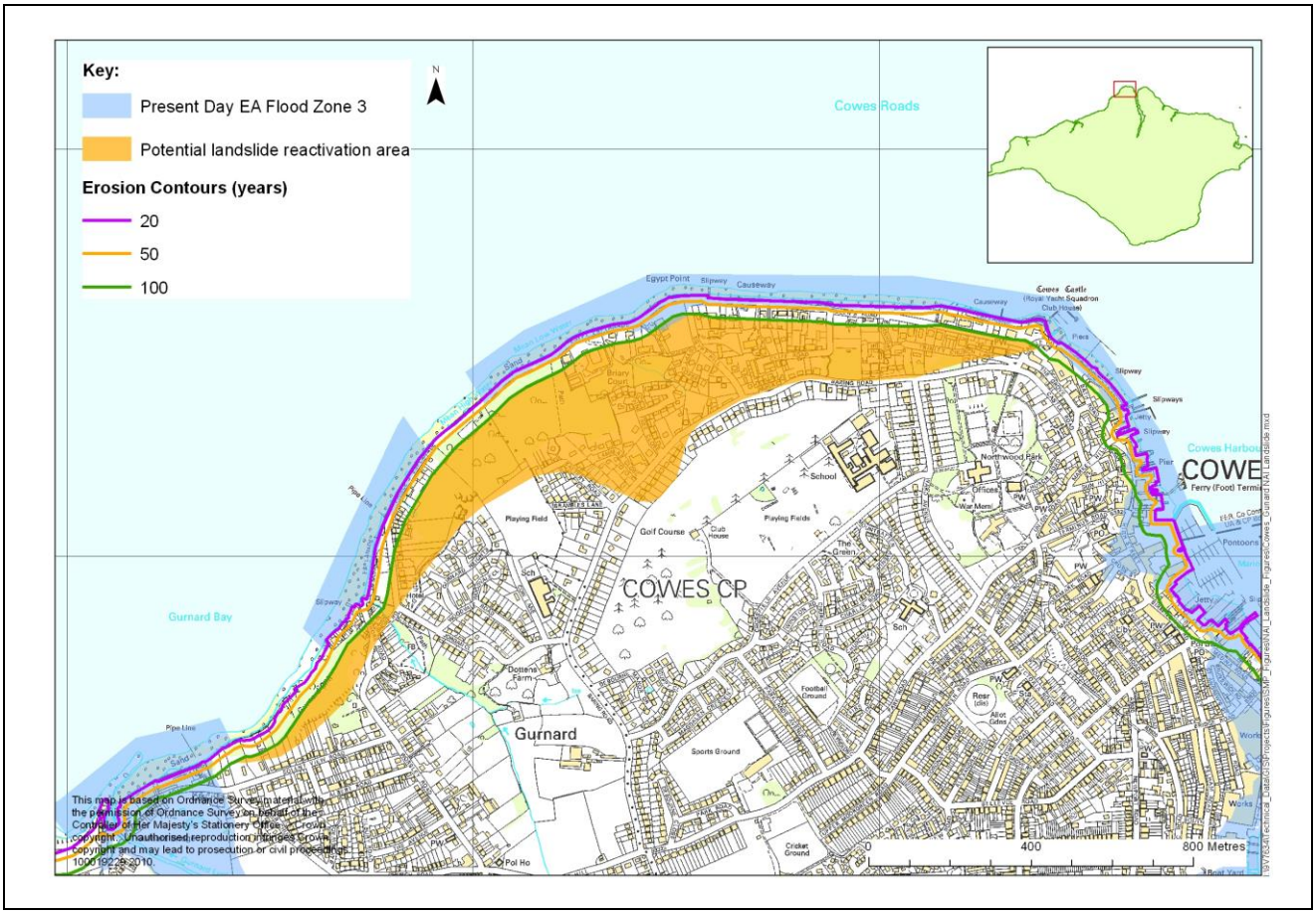
The overall intent of management is to address the short to medium term risks to the community by a policy of 'Hold the Line' for the first epoch allowing defences to be maintained for the next 20 years. Transferring to a policy of 'No Active Intervention' (NAI) in the second and third epochs (20-50 and 50-100 years) indicates the need for increasing medium to long term adaptation of the community to reduce the potential assets at risk as the impacts of sea level rise and fluvial flooding continue to increase in the medium to long term. The area is unlikely to qualify for national funding

of coastal defences but the focus in this area will be to support the aspirations of the existing local community through allowing maintenance of private defences and encouraging adaptation -whilst it is practical to do so in the face of increasing risks. No Active Intervention cannot preclude maintenance of existing private defences, but the clear intent of the shoreline management policy for the area is to indicate that this is a coastal area liable to significant change and the existing community will need to adapt, not continue to rely on defences in the long term.

Gurnard to Cowes Esplanade

The cliffs from Gurnard Luck to Gurnard in the west of this frontage are undefended, and likely to continue to retreat and increasingly reactivate under the NAI scenario. Complete re-activation of the coastal cliffs and slopes below Solent View Road properties may occur over 100 years. Continued erosion of this frontage is likely to outflank defences in the adjacent coastlines, therefore careful attention is required of the transitions from defended to undefended coast if this section remains largely undefended. There are some remains of some local defences and groyne structures reducing the rate of erosion. The area is unlikely to qualify for national funding of coastal defences and coastal retreat of the undefended cliffs is likely to continue under a policy of NAI.

The scale of potential landslide reactivation increases eastwards. From Gurnard to Cowes the low lying shoreline is backed by marginally stable degraded slopes and deep-seated coastal landslides. This is described further in the Cowes to Gurnard Coastal Slope Stability Study Ground Behaviour Assessment (Isle of Wight Council, 2000). The underlying landslide topography is vulnerable to slope failure and significant reactivation. The esplanade seawall shows signs of ground movement and between Egypt Point and West Cowes the upper coastal slopes exhibit evidence of instability. Coastal erosion at the toe of the coastal slope could trigger landslide reactivation at 2m/year affecting a zone 200-300m wide and over 2km in length, shown in the map below. This would be exacerbated by water in the ground, particularly winter rainfall. However, the pattern, intensity and progression of coastal slope retreat within the risk zone will be dependent on local conditions throughout the zone and the precise locations of breach of defences. This potential landslide zone is significantly larger than the 50m width zone of assets at direct risk from coastal erosion and flooding. Therefore the NAI erosion zones do not fully represent the risk to this residential area of Cowes and Gurnard.



Map showing potential erosion over the next 20, 50 and 100 years if 'No Active Intervention' occurs and coastal defences are allowed to fail and are not replaced. The map also shows (in orange) the zone of potential landslide reactivation or destabilisation which may result if significant shoreline erosion and cliff retreat occurs. Tidal Flood risk is shown in blue (note: the outer edges of the flood zones are simply cropped over the sea)

Several points should be noted in relation to proposed continuation of the 'With Present Management' scenario along the majority of the frontage. Without defences, complete reactivation of the coastal slope between Egypt Point and the Royal Yacht Squadron may occur and although the full reactivation process could involve relatively long timescales, it is important to note that initial ground movements could occur quite rapidly following the onset of toe erosion. Areas affected would be highly localised and related to the distribution of relic landslides on the slopes. Slope failure could also be triggered by high groundwater levels as ground conditions worsen with predicted increases in winter rainfall, but the current management practice (WPM scenario) of maintaining and replacing the existing seawalls is effective in minimising the major cause of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining. Commencement of erosion would deliver some benefits for nature conservation and deliver additional sediments to the shoreline which would be transported east into the mouth of the Medina Estuary.

The intent of the plan is to maintain a policy of Hold the Line for the frontage from central Gurnard to Cowes Parade due to the scale of assets at risk from coastal slope failure and landslide reactivation, with the addition of the impact of increasingly frequent tidal inundation of infrastructure and properties along that frontage. Tidal inundation would also add to the factors promoting slope destabilisation. A Hold the Line Policy would involve raising the level of the seawalls to protect against sea level rise. From central Gurnard to Cowes Parade there are wide seafront esplanades fronted by seawalls, allowing space to raise the level of defences (with the exception of the short constrained frontage of the Royal Yacht Squadron), although raising this barrier and potentially

sections of the coastal road would raise issues of access to the shoreline or access to properties on the landward side of the road that would need to be addressed.

Cowes and East Cowes

The towns of Cowes and East Cowes surround the mouth of the Medina Estuary, linked by a 'floating bridge' chain ferry. The transition from the open coast to the more sheltered Medina Estuary is recognised to occur at the floating bridge, which is important in terms of processes and environment, but the developed waterfronts of Cowes and East Cowes extend further inside the estuary mouth and face the same management problems of flood risk and maintenance of assorted private defences as the outer sections of the towns therefore are included in this discussion. Management of the area upstream of the Cowes floating bridge was not included within SMP1 so existing shoreline management policy has not been tested in part of this developed area. Cowes waterfront is dominated by detached and semi-detached properties and a range of maritime related industries. The waterfront of East Cowes is characterised by industrial activity. There are Conservation Areas within both towns. At the southern margins of the towns there are commercial wharfs at Medina Wharf and Kingston Wharf. Marine industries are generally reliant on their waterside locations. The land along either side of the estuary is relatively flat and is currently within the Flood Zones. Inland the land quickly rises in elevation. The NAI scenario places the coastal margins, ferry terminals and significant areas within the adjacent town centres of both towns at risk from increasing tidal inundation over the next 100 years, which is unacceptable if an alternative solution can be found which maintains the character and economic use of the area.

Periodic inundation already occurs in these developed frontages where the character of the existing defence line presents challenges to the implementation of a Hold the Line policy. The waterside frontages of Cowes are characterised by a historical patchwork of individual buildings and slipways forming the hard boundary of the estuary and holding the position of the estuary channel, but these structures were often constructed to provide private water access and not with a significant coastal protection function in mind. Piecemeal upgrading of these defences cannot reliably provide protection against the increasing levels of tidal flood risk. There is no uniform linear shoreline or current space within which to construct a raised defence in several stretches.

The present management of the shorelines of these towns has considered potential areas of building new defences immediately adjacent to the current defence line in Cowes, although this raises landowners concerns of losing private access to the shoreline. This can be examined further in the Coastal Defence Strategy Study and there may be opportunities to consider this option related to development proposals at specific locations. Significantly advancing the defence line could further constrict the estuary mouth and impact upon the Solent Maritime SAC and/or coastal processes.

If an effective way to minimise current and future flood risk cannot be implemented, the alternative will be to relocate parts of the town centre shopping streets to adjoining higher ground. Increasingly frequent tidal flooding may eventually lead to effective abandonment of areas over the next 100 years. Where marine industries and commercial wharfs in the south of the towns are reliant on a waterside frontage to maintain their businesses this provides an effective impetus for adaptation of improvement of private defences. Implementing a widespread policy of managed realignment would result in the loss of the existing waterfront commercial businesses and properties supporting the town. There are a large number of assets within this risk zone and the area is backed by residential areas or further development, therefore suitable sites to recreate these commercial interests are largely unavailable.

Raising the level of defences would need to be achieved in a way which preserves or enhances the character of the towns and maintains the navigable channel of the Medina, in order to achieve a successful and sustainable future for Cowes and East Cowes.

Therefore the overall intent of the plan is to strengthen the defences or Hold the Line. In detail or practice this may involve specific areas where defences would be held and improved, areas where

there may be scope for local advance in the line and areas where flood defence would be set back. The intention of 'Hold the line' may also include construction of defences immediately adjoining the current defence line. This would aim to address the short, medium and long term risks to the communities and commercial interests whilst allowing time for adaptation to the challenges of sea level rise. It is clear from the above that while the overall intent is to sustain the important built environment in the area, the approach needs specific development. This should be taken forward through the Coastal Defence Strategy Study and contribute to the Cowes Waterfront Initiative and it would be inappropriate for the SMP to develop such detail further. However, the essential role of the SMP is seen in highlighting that the present expectation of defence in its existing form is not considered sustainable and improvements in the standard of protection will be needed. The policy of Hold the Line is intended to allow maintenance of critical infrastructure to the Island including commercial wharfage/quays and infrastructure including the Power Station at the southern margin of East Cowes. At the eastern limit of East Cowes waterfront (outside the Shrape breakwater), the outer section of the existing seawall and esplanade provides popular waterfront access. The intention of the plan is to continue to maintain this structure in the short term whilst achievable to do so, whilst recognising that there are not the assets at risk or economic justification to significantly improve or replace this section of seawall in the medium to long term therefore transition to a policy of no active intervention is necessary.

Central Medina Estuary

The central section of the Medina Estuary is largely undefended and bordered by agricultural land, hedgerows and woods, including the shorelines from the southern limit of Cowes and East Cowes to the northern limit of the defences in Newport. A policy of No Active Intervention along the central estuary would allow natural processes to continue, including natural evolution of the saltmarsh habitat. Saltmarsh erosion is occurring predominantly in the middle and upper reaches of the estuary. The habitat is an important roosting and breeding ground and is known to support seven nationally important species. The Werrar saltmarsh provides some protection to the banks of the estuary and the important cycleway. There are scattered recreational and commercial moorings and short lengths of defended quays. There is a marina and residential development on the east bank at Island Harbour upstream of which the estuary towards Newport Harbour is not navigable at low water. The Marina is separated from the main channel by a grassed embankment and entrance lock. The West Medina Mills Wharf on the western bank is recognised as an important commercial wharf and development area.

Management of the area upstream of the Cowes floating bridge was not included within SMP1 so existing shoreline management policy has not been tested in this area of the central Medina Estuary. The overall intent of management in the plan is to maintain the natural character and evolution of the central Medina Estuary through a policy of No Active Intervention, whilst recognising that more local-scale issues are present within this overall intent. NAI would not preclude maintenance of limited areas of existing private defences at supporting properties at Island Harbour, Folly Inn and Dodnor Lane, but the longer-term intent is to move to more natural functioning of the estuary waterfront as flood risk increases in future epochs. The short defended frontage of West Medina Mills Wharf is a site of strategic commercial importance reliant on its waterfront location, and private maintenance, improvement or realignment of the quayside or flood defence at this location must take full consideration of the surrounding environment. Future development aspirations for the Medina valley may raise local issues at specific locations which cannot be addressed at SMP level. Points along the Cowes-Newport cycle route are likely to be inundated in flood events and future maintenance of this route will need to allow for increasing risks along the waterside.

Newport Harbour

The upstream limit of the SMP2 and the boundary with the CFMP is where the A3020 bridge crosses the river Medina at Newport, or effectively the walls surrounding Newport Harbour. The developed area of Newport Harbour is a functioning harbour characterised by moorings and pontoons surrounded by access roads, car parking and an area of waterside offices, amenity and commercial units, quayside and wharfs in an area of increasing tidal flood risk. The potential sites

most vulnerable to tidal flooding and an increase in sea level are those on both banks of the Medina between Seaclose Park and the crossing of the A3020, where the flood risk is significantly more extensive in the second and third epochs. The areas immediately upstream of the A3020 near Coppins Bridge and beyond the Quay Arts Centre are also at risk. There is a risk of multiple sources of flooding induced by a (spring) high tide occurring with a high rainfall event. Further information can be found in the IW SFRA Appendix Q (in press). Management of this area was not included within SMP1 so existing shoreline management policy has not been tested in this area. The current defences surrounding the harbour and upper reaches of the estuary are insufficient to prevent tidal flood risk therefore continuing 'With Present Management' would require the level of defences to be raised. There are open areas of car parking/boat storage around the narrowing upper harbour where further defences could be constructed but may impede access to the functional waterway, although there are restrictions elsewhere in some areas where access space around the river is restricted by adjacent buildings and private industrial units. More detail is now available in the West Wight Coastal Flood and Erosion Risk Management Strategy (2016).

The management intent of the Shoreline Management Plan for this defended area is to implement a policy of Hold the Line which will maintain the navigational use of the channel and the functioning harbour and surrounding waterside commercial interests.

PDZ1
Management Area Statements

- **Gurnard, Cowes and East Cowes (Gurnard Luck to East Cowes Promenade and Entrance to the Medina) (MA 1A)** includes six policy units
- **Central Medina Estuary and Newport (MA 1B)** includes five policy units

Within these areas a summary of policy is provided below. Management Areas statements are provided in the following sheets, with maps showing each area.

Location reference	**Gurnard, Cowes and East Cowes**
Management Area reference	**MA 1A**
Policy Development Zone	**PDZ 1**

The following descriptions are provided to assist interpretation of the maps shown of each Management Area.

* Note: Predicted shoreline mapping is based on a combination of monitoring data, analysis of historical rates 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 (see Appendix C3).

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 "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 Preferred Policy this distinction is made in showing two different lines:

With Present Management.
Preferred Policy.

-  In some areas, the Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

Flood Risk Zones:
All flood risk zones are based upon the current tidal EA Flood Zone 2. This is an extreme flood event (1:1000 year at current levels) meaning that it has 0.1% chance of occurring each year.

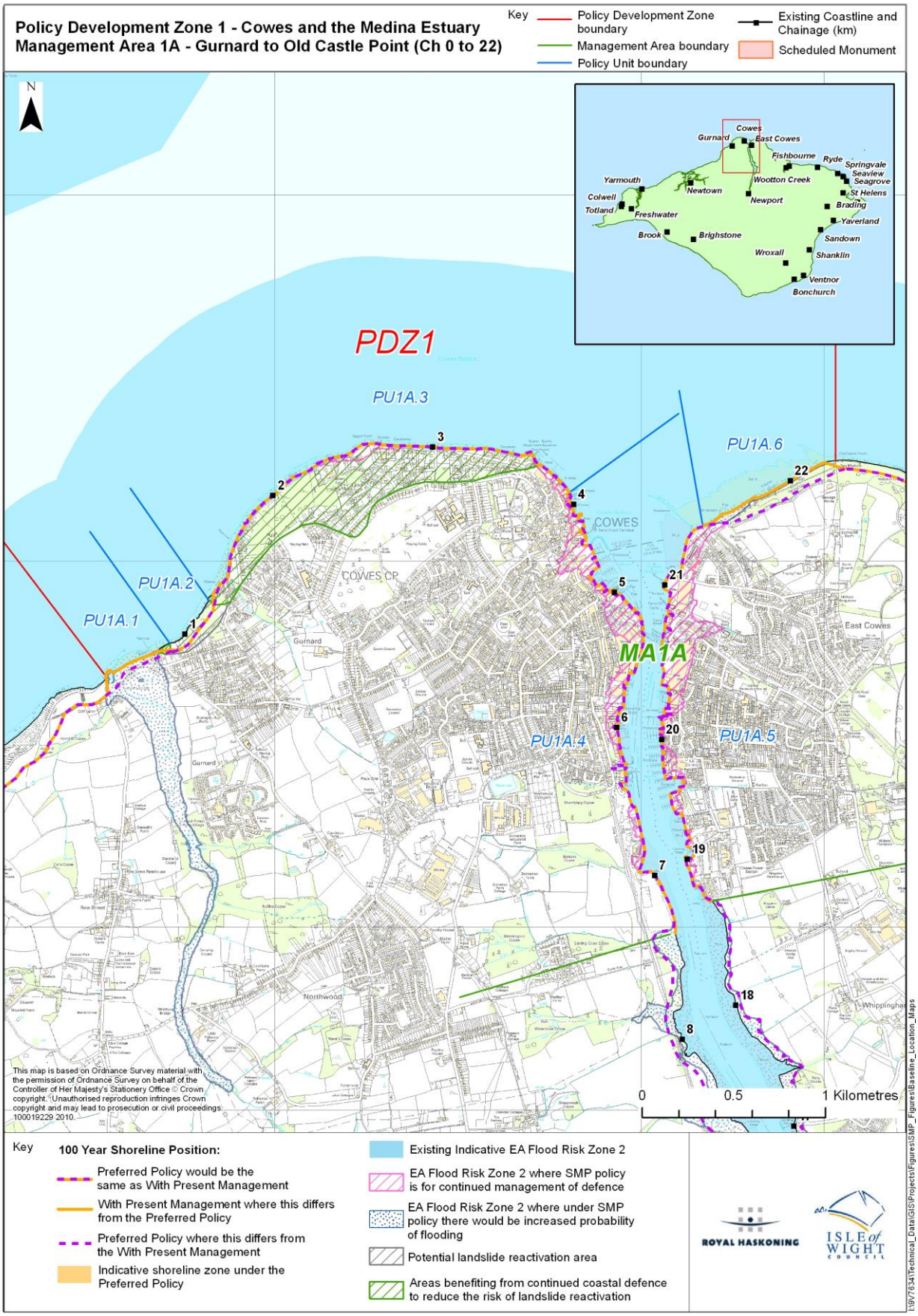
General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP 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 SMP document.

Note: This Management Area corresponds to IW55,56,57,59 and IW1 in selected Appendices.


Policy Development Zone 1 - Cowes and the Medina Estuary
Management Area 1A - Gurnard to Old Castle Point (Ch 0 to 22)
Key
Policy Development Zone boundary
Management Area boundary
Policy Unit boundary
Existing Coastline and Chainage (km)
Scheduled Monument
N
Cowes
Gurnard
East Cowes
Fishbourne
Ryde
Springvale
Seaview
Seagrove
Yarmouth
Wootton Creek
Newtown
St Helens
Colwell
Newport
Brading
Totland
Freshwater
Yaverland
Brook
Brighstone
Sandown
Wroxall
Shanklin
Ventnor
Bonchurch
PDZ1
PU1A.1
PU1A.2
PU1A.3
PU1A.4
PU1A.5
PU1A.6
MA1A
COWES
COWES CP
East Cowes
Gurnard
Northwood
Whippingham
1
2
3
4
5
6
7
8
18
19
20
21
22
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0
0.5
1 Kilometres
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
Indicative shoreline zone under the Preferred Policy
Existing Indicative EA Flood Risk Zone 2
EA Flood Risk Zone 2 where SMP policy is for continued management of defence
EA Flood Risk Zone 2 where under SMP policy there would be increased probability of flooding
Potential landslide reactivation area
Areas benefiting from continued coastal defence to reduce the risk of landslide reactivation
ROYAL HASKONING
ISLE of WIGHT COUNCIL
I:\9V7634\Technical_Data\GIS\Projects\Figures\SMP_Figures\Baseline_Location_Maps

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The overall intent of the management of this area is to sustain the existing built environment use of the waterfront, but recognising that in some areas including the outer East Cowes Promenade and at Gurnard Luck there are going to be sections of existing defence that will need to abandoned or realigned in the medium to long term. The transition from the open coast to estuary is recognised to occur at the Cowes floating bridge and this will remain an important control on the future evolution of the area; however, the developed coastlines of the towns of Cowes and East Cowes extend inside the estuary mouth and face the same problems of flood risk and maintenance of an assortment of private defences as the outer sections of the towns. Therefore, the entire developed coastline is included within one management area to encourage an integrated approach to address the significant future risks the area faces.

The intention of shoreline management of the area is to recognise and support the intrinsic nature of the waterfront location essential to a successful and sustainable future for Cowes and East Cowes. The management approach recommends the maintenance and raising of the standard of the current public and private defences lining the majority of the Gurnard, Cowes and East Cowes seafronts to address flood, erosion and landslide risks to these significant communities. This will also maintain the navigable channel of the Medina Estuary, supporting use of the Estuary waterfront within this area and also in the management unit to the south (MAN1B). It is recognised however that raising the level of existing private flood defences may be difficult to achieve in the centre and south of Cowes and East Cowes in a way which preserves or enhances the character of the area and the nature conservation interest of the Medina, whilst maintaining waterfront access. The scale of the assets at risk (including residential and amenity development, marine industries and commercial wharfs) and their importance to the local and Isle of Wight economies justified further examination and the development of a detailed approach through a Coastal Strategy. This is now completed and available. Please refer to the *West Wight Coastal Flood and Erosion Risk Management Strategy*, 2016, Chapter 10, for the latest approach. This is available online on www.iow.gov.uk, please select 'Coastal management' then choose 'Plans and strategies'. Whilst the specific shoreline management approach may vary for localised areas of defence (e.g. defences immediately adjacent to current defences, or opportunities linked to developments), the intention would be in-keeping an overall management approach of holding the defence line of the wider area. It is important to note that this management intent should not preclude consideration of medium to long term adaptation of the town centres and communities; adaptation should be encouraged as risks will continue to increase as sea level rises and storm events occur.

At the western limit of this area the intent of management at Gurnard Luck is to support the existing community in the short term whilst allowing medium to long term adaptation. This area faces increasing risks of tidal and fluvial flooding and erosion. The intention of shoreline management policy is to recognise the aspirations of the existing local community to maintain private defences and continue implementing adaptation techniques to the increasing risks whilst it is practical to do so, including raising the level of their own properties. The intention is to transfer from a Hold the Line policy to a No Active Intervention policy in the medium term. Although the NAI policy cannot preclude maintenance of existing private defences, it is important to recognise that the frontage is unlikely to qualify for national funding of coastal defences and the clear intent of the shoreline management policy for the area is to highlight that this is a coastal area liable to significant change and the existing community will need to adapt, not continue to rely on defences in the long term. To the east, the cliffs from Gurnard Luck to Gurnard are largely undefended, and coastal retreat and resulting slope reactivation is expected to continue which will provide some sediments to the shorelines to the east. These areas have also been further examined in the *West Wight Coastal Flood and Erosion Risk Management Strategy*, 2016. Along Gurnard cliff (along Solent View road) the properties are generally set back from the coastline so there is therefore a very limited risk to assets over the next 100 years and the policy approach is to allow natural processes to continue.

A policy of No Active Intervention cannot preclude maintenance of existing short stretches of private defences.

The coastal slopes around the Cowes and Gurnard headland are an area of potential landslide reactivation, as shown on the map above. Further information on this can be found in the *Cowes to Gurnard Slope Stability Study* (2000) and in the *West Wight Coastal Flood and Erosion Risk Management Strategy* (Chapter 9), both of which are available on www.iow.gov.uk, please select 'Coastal management', then choose 'Landslides and ground movement' or also 'Plans and strategies'.

At the eastern limit of the management area the outer section of the defended East Cowes esplanade (outside the Shrape breakwater) provides popular waterfront access towards Old Castle Point. The intention of the plan is to continue to maintain this seawall in the short term whilst achievable to do so, whilst recognising that there are not the assets at risk to justify replacement of this defence in the medium to long term therefore transition to a policy of no active intervention is necessary. This policy approach has been reconfirmed by the *West Wight Coastal Flood and Erosion Risk Management Strategy*, 2016. This approach will have impacts on the surrounding nature conservation interest and increase local sediment supply to the shore as the coast begins to retreat with potential impacts on the mouth of the estuary as sediments drift to the east, although the source area is limited.

Elsewhere, continued retreat of the coastal cliffs along the north-west coastline of the Isle of Wight may supply additional sediments into this management area from the west by longshore drift. Local drift divergence means that additional sediment inputs are not anticipated into this management area from the east.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain and improve existing defences (seawalls) along the majority of the frontage, including developing a co-ordinated approach to addressing tidal flood risk to Cowes and East Cowes. NAI at Gurnard Cliff.
Medium term	Maintain and improve existing defences (seawalls) along the majority of the frontage, with the following exceptions: continue NAI at Gurnard Cliff; transfer to NAI at Gurnard Luck and outer East Cowes esplanade.
Long term	Maintain and improve existing defences along the majority of the frontage, with the following exceptions: continue NAI at Gurnard Cliff, Gurnard Luck and outer East Cowes esplanade.

SUMMARY OF SPECIFIC POLICIES

Policy Unit (& length)		**Policy Plan**			
		to 2025	**to 2055**	**to 2105**	**Comment**
PU1A.1	**Gurnard Luck** (433m)	HTL	NAI	NAI	HTL supports the existing community and allows time for adaptation. Unlikely to qualify for national funding but HTL would allow small scale private defences to be maintained. Moving to NAI reflects the medium to long term increasing risks and need for increasing adaptation. NAI would not preclude maintenance of private defences
PU1A.2	**Gurnard Cliff** (346m)	NAI	NAI	NAI	
PU1A.3	**Gurnard to Cowes Parade** (2,616m)	HTL	HTL	HTL	
PU1A.4	**West Cowes** (3,481m)	HTL	HTL	HTL	Recognise that HTL may be difficult to achieve with sea level rise and the community may need to consider coastal adaptation. This area has been examined further in the West Wight Coastal Flood and Erosion Risk Management Strategy (2016) available online at www.iow.gov.uk.
PU1A.5	**East Cowes** (2,814m)	HTL	HTL	HTL	Recognise that HTL may be difficult to achieve with sea level rise and the community may need to consider coastal adaptation. This area has been examined further in the West Wight Coastal Flood

					and Erosion Risk Management Strategy (2016) available online at www.iow.gov.uk.
PU1A.6	**East Cowes Outer Esplanade** (828m)	HTL	NAI	NAI	HTL by maintenance of the existing seawall until the end of its effective life, gradually removing the influence of management.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

The management outlined above is overall in accordance with SMP1 (1997) and the North East Coastal Defence Strategy (2004), with the following changes:

- Removal of the alternative option of Advance the Line from Cowes and East Cowes, (although the management intent of SMP2 is to consider opportunities for localised areas of shoreline change within the overall intent to Hold the Line of the towns bordering the Estuary mouth).
- A change at Gurnard Luck from a policy of Hold the Line for 50 years in SMP1 to a more realistic and sustainable policy of HTL for 20 years followed by NAI (which would not preclude maintenance of existing private defences) to indicate the need to adapt to increasing risks and not rely on defences in the long-term.
- For the outer East Cowes esplanade, to accord with the intention stated in the North East Strategy (and raised as HTL or Retreat the Line in SMP1) that at the end of life of the existing maintained seawall, not to rebuild the defence.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	220,025	281,555	318,350	819,931
	Preferred Plan Damages £k PV	6,480	7,463	7,093	21,036
	Benefits £k PV	213,545	274,092	311,257	798,895
	Costs of Implementing plan £k PV	976	1,391	3,428	5,794

The preferred plan for this Management Area is clearly economically viable overall. Individual schemes will need to be investigated in further detail to assess their economic viability and affordability.

Location reference	**Central Medina Estuary and Newport**
Management Area reference	**MA 1B**
Policy Development Zone	**PDZ 1**

The following descriptions are provided to assist interpretation of the maps shown of each Management Area.

* Note: Predicted shoreline mapping is based on a combination of monitoring data, analysis of historical rates 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 (see Appendix C3).

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 "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 Preferred Policy this distinction is made in showing two different lines:

With Present Management.
Preferred Policy.

-  In some areas, the Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

Flood Risk Zones:
All flood risk zones are based upon the current tidal EA Flood Zone 2. This is an extreme flood event (1:1000 year at current levels) meaning that it has 0.1% chance of occurring each year.

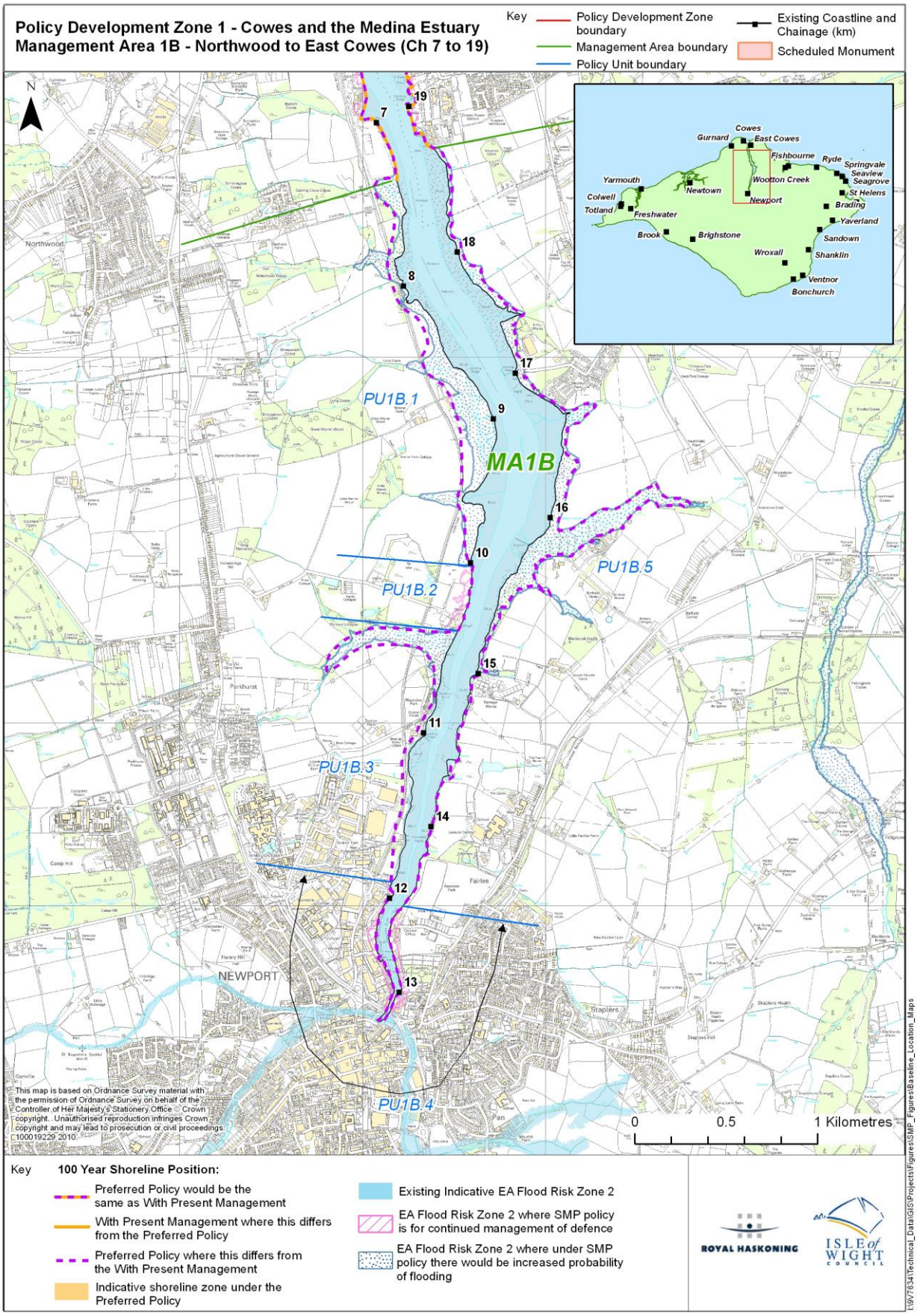
General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP 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 SMP document.

Note: This Management Area corresponds to IW58 in selected Appendices.


Policy Development Zone 1 - Cowes and the Medina Estuary
Management Area 1B - Northwood to East Cowes (Ch 7 to 19)
Key
Policy Development Zone boundary
Management Area boundary
Policy Unit boundary
Existing Coastline and Chainage (km)
Scheduled Monument
N
Cowes
Gurnard
East Cowes
Fishbourne
Ryde
Springvale
Seaview
Seagrove
Yarmouth
Wootton Creek
Newtown
St Helens
Colwell
Newport
Brading
Totland
Freshwater
Yaverland
Brook
Brighstone
Sandown
Wroxall
Shanklin
Ventnor
Bonchurch
Northwood
PU1B.1
MA1B
PU1B.5
PU1B.2
PU1B.3
PU1B.4
NEWPORT
Parkhurst
Fairlee
Staplers
7
8
9
10
11
12
13
14
15
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17
18
19
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0
0.5
1 Kilometres
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
Indicative shoreline zone under the Preferred Policy
Existing Indicative EA Flood Risk Zone 2
EA Flood Risk Zone 2 where SMP policy is for continued management of defence
EA Flood Risk Zone 2 where under SMP policy there would be increased probability of flooding
ROYAL HASKONING
ISLE of WIGHT COUNCIL
I:\9V7634\Technical_Data\GIS\Projects\Figures\SMP_Figures\Baseline_Location_Maps

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The overall intent of management in this area is to allow the estuary to adapt as naturally as possible to sea level rise. Within this it is recognised and considered viable to defend important areas of Newport and strategic commercial wharfs without overall impact on the broader scale intent. The balance sought is to sustain appropriate commercial and community use of the Medina Estuary within the context of maintaining and enhancing the internationally important natural environment and adapting to future flood risk.

The intention of shoreline management is to maintain the alignment and functioning of the existing defended frontages in the upper estuary within the town of Newport and at West Medina Mills Wharf, where maintaining the waterfront location and access are intrinsic to the effective functioning of these developed sites. In contrast to these limited frontages, the intent of management for the majority of the area is to allow the long central stretches of the Estuary to adapt naturally to sea level rise (on both the eastern and western banks) through a policy of No Active Intervention, in keeping with the importance of the natural and historic environment. This will include large stretches of shoreline remaining undefended, although also within this area there are limited areas of existing private defences protecting isolated developments or properties including at Dodnor Lane, Island Harbour and Folly Inn. Whilst the policy of No Active Intervention cannot preclude maintenance of existing private defences which will maintain the existing use of the sites in the short to medium term, the intention of management is to allow and encourage adaptation to increasing flood risk in the medium to long term. The intention of the management is to avoid significant increase in the extent of assets at future flood risk, recognising there will not be public investment in further defences and that the existing defences should not be maintained indefinitely in the face of future sea level rise. In the long term the policy will reduce the impact of the defences over time and to restore as much as possible of the natural function and capacity for the estuary to adapt to sea level rise. It will reduce the potential impact of tidal flooding and provide benefits for the nature conservation interest of the area. It is important to note that future development aspirations for the Medina valley may raise local issues at specific locations which cannot be addressed at SMP level.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	No active intervention in the central Medina Estuary (although this would not preclude maintenance of limited areas of existing private defences), with the following exception: Hold the Line of existing defences at West Medina Mills Wharf to maintain functional quayside. Hold the line at Newport Harbour and the upper Medina by maintaining or raising the existing defences forming the harbour walls and quaysides.
Medium term	Continue NAI in the central Medina Estuary (although this would not preclude maintenance of remaining areas of existing private defences), with the following exception: Maintain or raise defences at West Medina Mills wharf to maintain functional quayside. Maintain or raise defences surrounding Newport Harbour.
Long term	Allow natural adaptation of the central Medina Estuary to sea level rise. Maintain defences at West Medina Mills Wharf to maintain functional quayside. Maintain or improve defences surrounding Newport Harbour.

SUMMARY OF SPECIFIC POLICIES

Policy Unit (& length)		**Policy Plan**			
		to 2025	**to 2055**	**to 2105**	**Comment**
PU1B.1	**Central Medina – NW** (2,697m)	NAI	NAI	NAI	NAI would not preclude maintenance of private defences
PU1B.2	**West Medina Mills** (370m)	HTL	HTL	HTL	Private defences will be maintained
PU1B.3	**Central Medina – SW** (1,486m)	NAI	NAI	NAI	NAI would not preclude maintenance of private defences
PU1B.4	**Newport Harbour** (1,634m)	HTL	HTL	HTL	HTL with public and private defences

PU1B.5	**Central Medina – East** (5,111m)	NAI	NAI	NAI	NAI would not preclude maintenance of private defences
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

This area was not included in SMP1 or Coastal Defence Strategy Studies therefore shoreline management policies have not been tested in this area.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		**by 2025**	**by 2055**	**by 2105**	**Total £k PV**
Property	Potential NAI Damages/ Cost £k PV	17,411	24,408	30,166	71,984
	Preferred Plan Damages £k PV	16,022	15,731	14,365	46,118
	Benefits £k PV	1,389	8,677	15,801	25,866
	Costs of Implementing plan £k PV	104	812	50	966

The preferred plan for this Management Area is economically viable overall. Individual schemes will need to be investigated in further detail to assess their economic viability and affordability.