

## Pembrey Burrows (13)



### Recommendations:

#### Long Term Plan

Pembrey Burrows is a barrier beach and dune system of international environmental value, bordered by the large estuary systems of Loughor to the east, and the Three Rivers Estuarine Complex to the west. The preferred policy option is to enable the system to continue functioning as naturally as possible, whilst recognising the continued operation of Pembrey Country Park and RAF Pembrey Sands Air Weapons Range at the north-western end of Pembrey Burrows.

There are some small localised defence structures (detached rock breakwaters), which appear to have been constructed to manage the risk of coastal erosion to parts of RAF Pembrey Sands. Although these defences do not currently appear to be having a significant effect on dune processes, it is likely that they would need to be removed, since over time they will be outflanked by continued retreat of the dunes along undefended frontages. It is recommended that adaption/ resilience measures are developed and adopted at RAF Pembrey Sands to manage the risk of coastal erosion and flooding to existing assets. In the long term as a result of future sea level rise and increased risk of coastal erosion and tidal flooding the range may need to be relocated.

Location (Policy Unit)		Preferred SMP2 policy and proposed approach to implementing the Plan		
		0-20 years	20-50 years	50-100 years
13.1	<b>Pembrey Sands (The Nose to South of Tywyn Point)</b>	The policy is to enable the dune system to function naturally with minimal interference, whilst allowing localised dune management as required, through <b>managed realignment</b> . Removal of defences should be considered, as they begin to have an adverse impact on dune development and integrity.		

A review of the impacts of the preferred SMP2 policy on coastal evolution and behaviour is provided in Appendix E: Policy Development and Appraisal, Section E1.3.

#### Policy sensitivities and key uncertainties (further detail is included in Appendix K)

This policy is sensitive to MoD decisions regarding future management of the RAF Pembrey Sands Air Weapons Range at the north-western end of Pembrey Burrows. It is recommended that the impact of existing localised defences is monitored, to inform the development of suitable mitigation measures which may include adaptation, flood protection, flood resilience or relocation of assets.

Although it is unlikely that the policy of allowing the dunes to evolve naturally will change, how the dunes will evolve is uncertain, due to their sensitivity to various factors, including sediment supply, wind-wave climate, storminess, nearshore bathymetry, changes in the adjacent estuaries and future climate change. Increased monitoring would improve understanding of the dune systems and their future response.

#### Changes from present management / SMP1 policy<sup>1</sup>

This policy concurs with the SMP1 policy. It is also generally a continuation of present management, with the exception of the localised defences at RAF Pembrey Sands Air Weapons Range.

<sup>1</sup> The SMP1 documents should be referred to for more details as unit boundaries do not always align with SMP2 policy units and the policies refer to different time periods.

<b>Pembrey Burrows (13)</b>	
(this is a summary of impacts, for full details see <b>Appendix G SEA Report</b> )	
<b>Issue</b>	<b>Appraisal</b>
<b>Receptor: Property, population and human health</b>	
There are no settlements along this generally undeveloped frontage. There are camping and caravan sites at Pembrey Country Park, although these are situated at the landward side of the park.	
Will SMP policy maintain coastal settlements and manage the impact of coastal flood and erosion?	X There are no coastal settlements along this frontage.
Will SMP policy directly increase the actual or potential coastal erosion or flood risk to communities?	X There are no communities along this frontage. Caravan and camping sites are sufficiently far inland not to be at risk from coastal erosion or flooding in the long term.
Is SMP policy sufficiently flexible to take account of dynamic coastal change?	+ The SMP policy recognises dynamic coastal change, with a policy of managed realignment. This will allow natural beach and dune evolution, although some localised dune management could be undertaken, as required.
Could there be a detrimental impact on the fabric of coastal communities?	X There are no coastal communities along this frontage.
<b>Receptor: Land use, infrastructure and material assets</b>	
The frontage is generally undeveloped, consisting of a beach and heavily vegetated dune system. Pembrey Country Park is at the southern end of the frontage and includes a dry ski slope, miniature train and horse riding, as well as a caravan park, conservation areas and cycle and walking trails. RAF Pembrey Sands Air Weapons Range, an operational air-to-ground bombing and strafing range which lies at the north-western end of the frontage.	
Will SMP policy maintain key industrial, commercial and economic assets and manage the impact of coastal flooding and erosion?	X Little risk to Pembrey Country Park due to the stability of the dune system.
Will the SMP policy ensure critical services and infrastructure remain operational, for as long as required?	X There is limited infrastructure along this section of coast.
Will there be an impact on marine operations and activities?	X There are no large scale marine operations along this frontage.
Will SMP policy impact coastal flooding or erosion on agricultural activities?	X There are no agricultural activities along this shoreline.
Will the SMP policy ensure that MoD (Qinetiq) ranges remain operational?	- Potential risk to RAF Pembrey Sands Air Weapons Range subject to future climate change and rates and location of dune erosion or breach. Defences could be removed if they are thought to be having a significant adverse impact on dune integrity.
<b>Receptor: Amenity and recreational use</b>	
Pembrey Country Park contains a number of amenity and tourist facilities and the wide sandy beach is used for bathing, recreation, amenity and various sports (such as kite-buggying and kite-mountainboarding)	
Could the SMP policy have an impact on tourism in the area?	X Little risk of coastal erosion and flooding to Pembrey Country Park due to the stability of the dune system.  - Risk of natural beach narrowing as sea level rises as the heavily forested dunes are likely to reduce retreat.
Will SMP policy affect coastal access along, or to, the coast?	X No risk to coastal access.
<b>Receptor: Historic environment</b>	
There is no nationally designated archaeology along this shoreline. Locally important archaeology includes wrecks, peat deposits, fish weirs and military remains.	
Will SMP policy maintain the fabric and setting of key historic listed buildings, cultural heritage assets and conservation areas?	X There is no nationally designated archaeology.  - Potential risk to local archaeology on the foreshore although risk is subject to future rates of erosion.
Will the SMP provide sustainable protection of archaeological and palaeo-environmental features or ensure adequate time for monitoring, assessment and mitigation measures to be devised in response to ongoing and future erosion.	● Assets on the foreshore are at risk from erosion and submergence. SMP policy would not affect whether there is adequate time for monitoring, assessment and mitigation measures as risk is dependent on future rates of sea level rise and coastal erosion.
<b>Receptor: Landscape character and visual amenity</b>	
There are no specific landscape designations along this frontage; however, the area is noted for its dune and foreshore interest.	
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the coastal landscape?	+ The proposed policy would allow ongoing natural evolution of the system which would maintain the character of this landscape.
Could SMP policy lead to the introduction of features which could be unsympathetic to the character of the landscape?	+ There is no intent to provide any additional defences.
<b>Receptor: Biodiversity, flora and fauna</b>	
Pembrey Coast is designated SSSI and the frontage is also within the Carmarthen Bay Dunes SAC.	
Will SMP policy enable a sustainable approach to habitat management?	+ A policy of managed realignment will enable the dune and beach barrier system to continue to evolve naturally.
Will SMP policy maintain or enhance any international, national or local sites of natural conservation interest?	+ The shoreline will continue evolving naturally.  ● Natural intertidal narrowing, since the heavily vegetated dunes are likely to reduce the rate of coastal retreat (in response to future sea level rise), will lead to a reduction in the width of the sandy intertidal beach.  ● Sea level rise may lead to erosion of vegetated dunes and potential inundation of dune slacks, which could affect species supported.
Will SMP policy <u>accelerate</u> intertidal narrowing (coastal squeeze) and will this affect designated habitats?	+ The shoreline would be allowed to evolve naturally. Intertidal narrowing is likely to occur as the heavily vegetated dunes may not retreat at the same rate as the sea level rises. This is dependent upon future rates of sea level rise.
Will there be a net loss of BAP habitat within the SMP timespan as a result of SMP policy?	● Loss of existing intertidal mudflats however, there would be scope for this habitat to extend inland due to realignment of defences.  - Build up of saltmarsh vegetation at the eastern end of Pembrey

<b>Pembrey Burrows (13)</b> (this is a summary of impacts, for full details see <b>Appendix G SEA Report</b> )	
<b>Issue</b>	<b>Appraisal</b>
	Burrows.
<b>Receptor: Earth heritage, soils and geology</b> Pembrey Burrows is within the Carmarthen Bay Dunes SAC and Carmarthen Bay and Estuaries SAC, SPA and Ramsar sites.	
Does SMP policy work with natural processes and enhance or maintain natural features?	+ A policy of managed realignment will allow continuation of natural processes and maintenance of significant coastal features.
Will SMP policy maintain or enhance the visibility of coastal geological exposures, where designated?	• Natural intertidal narrowing would lead to loss of sandbank and sand and mudflat extents.
<b>Receptor: Water</b> There are numerous coastal, freshwater, transitional (areas of water near river mouths, which are partially saltwater but are influenced by freshwater) and groundwater bodies in the SMP2 area that have the potential to be affected by SMP2 policies.	
Will SMP policy manage the risk of pollution from contaminated sources?	x There are no known contamination issues along this shoreline.
Will SMP policy adversely affect water bodies in the coastal zone?	+ The Loughor Outer water body will experience improvement in biological quality elements as MR would allow the development of further dune wetland habitats within the largely undeveloped Pembrey sands dune system. This will support WFD objectives. • The Carmarthen Carboniferous Coal Measures groundwater body will be unaffected. There are no associated surface freshwater bodies.

Impact colour key	+ Positive	• Neutral	- Negative	x Not applicable
-------------------	------------	-----------	------------	------------------

Pembrey Burrows (13)						
ACTION PLAN						
Action	Action Ref	Policy Unit	Action Description (to be approved)	Potential source for funding (subject to approval)	Responsibility (Lead partner * (supporting partners))	When by (subject to funding)
<b>1. Studies for Scenario Area</b>	1.1	13.1	Undertake study to investigate the future evolution of Carmarthen Bay and adjacent estuaries to confirm impacts of future climate change on estuary development and the dune systems. This will require the collection of data relating to bathymetric change, wind and wave regime, tidal regime, rainfall, river discharge, sediment sources, transport pathways and sediment fluxes in the long term since there is currently a lack of such data to enable a full understanding of the interactions between physical processes and coastal morphological change.	WAG	Coastal Group (Wales Coastal Monitoring Centre)	0 to 100 years
<b>2. Studies for Policy Units</b>	2.1	13.1	Undertake breach analysis at Pembrey Burrows to consider risk of a breach at both the southern and north-western ends of the barrier. Study to consider current and future risk under a range of future climate change/ sea level rise scenarios. Consider future dune evolution, including the feasibility of dune remobilisation at Pembrey Burrows and potential impacts.	WAG, MoD	CCC (CCW & MoD)	0 to 20 years
	2.2	13.1	Undertake a feasibility study for RAF Pembrey Sands Air Weapons Range to consider the potential impacts under a range of future climate change/ sea level rise scenarios to inform the development of suitable adaptation and mitigation measures which may include flood resilience, flood protection or relocation of assets.	MoD	MoD	0 to 20 years
<b>3. Strategy</b>			-			
<b>4. Scheme work</b>			-			
<b>5. Monitoring (data collection)</b>	5.1	13.1	Undertake beach and coastal defence asset monitoring to inform further studies and future SMP reviews. In particular rates of dune erosion should be monitored. This information should not only be used in future coastal management, but also to assist in stakeholder liaison for use of data in public education campaigns.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 100 years
	5.2	13.1	Continue with existing beach profile monitoring programme and provide information to Wales Coastal Monitoring Centre for storage and analysis. Use beach profile data to identify the future risk of undermining and overtopping of existing defences.	WAG	Coastal Group (Wales Coastal Monitoring Centre)	0 to 100 years
	5.3	13.1	Undertake periodic defence inspection, grading condition assessment and photographs. Confirm defence crest levels.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 100 years
	5.4	13.1	Undertake further studies and associated modelling to better understand sediment regimes in the SMP area and inform future coastal management.	WAG	Coastal Group	0 to 20 years
	5.5	13.1	Monitor risk to the coastal footprint and investigate potential re-routing of the path where appropriate.	WAG	CCC	Ongoing
<b>6. Asset management</b>	6.1	13.1	Ensure that extent of public and privately owned defences are defined and mapped to inform future management decisions.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 20 years
	6.2	13.1	Undertake appraisal of asset inspection and beach profile monitoring data to assess the existing and future risk of undermining and overtopping of existing structures.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 20 years
<b>7. Communication</b>	7.1	13.1	Undertake consultation with the local community, key stakeholders and general public during the development of suitable mitigation measures and whenever appropriate to ensure an acceptable approach is developed and adopted.	WAG	CCC	0 to 20 years
	7.2	13.1	Undertake monitoring and management of Action Plans to ensure SMP policies are put into practice.	WAG	Coastal Group	0 to 100 years
<b>8. Interface with planning and land management</b>	8.1	13.1	Continue with risk-based improvements to flood risk maps to provide an appraisal of likely future projected sea level rise.	WAG	EAW	0 to 20 years
	8.2	13.1	Ensure SMP policies and flood and erosion risks are accounted for in the next revisions of land use plans in order to	WAG	CCC planning	0 to 20 years

			help manage residual risks from coastal erosion and flooding to inform future planning decisions.			
<b>9. Emergency response</b>	9.1	13.1	Develop, monitor and review emergency response plans to prepare for storm events which may have the potential to overtop or breach the existing dune systems in particular at RAF Pembrey Sands Air Weapons Range.	MoD	MoD	0 to 20 years
<b>10. Adaptation / resilience</b>			-			
<b>11. Flood forecasting and warning</b>	11.1	13.1	Continue with risk-based improvements to flood risk maps and inundation modelling to provide improved flood warning service.	WAG	EAW	0 to 20 years
<b>12. Habitat creation and environmental mitigation</b>	12.1	13.1	Welsh Assembly Government instructed Environment Agency Wales to scope out the scale of potential coastal habitat gains and losses for Wales. The scoping exercise was completed in February 2011 and identified potential options for implementation of a National Habitat Creation Programme for Wales. How this programme is to be delivered and funded has yet to be decided.	WAG	TBC	Ongoing

\* Note: It is recommended that the lead partner/s investigate the potential for local partnerships and alternative sources of funding.

SUPERSEDED

Contact SPS/SG with current action plan