Pembrokeshire Coast National Park Management Plan (2020-2024)

Background Paper 6:
Climate and energy

Pembrokeshire Coast National Park Authority
September 2018

About the UK's national parks

The purposes of UK National Park are set out in the Environment Act 1995. They are:

(a) conserving and enhancing the natural beauty, wildlife and cultural heritage of the area

(b) promoting opportunities for the understanding and enjoyment of the special qualities of those areas by the public

In the event of an irreconcilable conflict between the purposes, conservation has greater weight (the 'Sandford principle').

Pembrokeshire Coast National Park Authority is charged with delivering the purposes in Pembrokeshire Coast National Park and has a duty to seek to foster the social and economic wellbeing of National Park communities in its pursuit of the purposes.

Management Plan 2020-2024

Each National Park Authority is required to prepare a five-yearly National Park Management Plan "which formulates its policy for the management of the relevant Park and for the carrying out of its functions in relation to that Park" (Environment Act 1995, section 66). The Environment Act 1995 gives relevant authorities a legal duty to have regard to Park purposes and to the Sandford Principle[1].

A number of background papers have been compiled in preparation for the Pembrokeshire Coast National Park Management Plan 2020-2024. They cover:

1. Landscape, seascape, tranquillity and dark skies
2. Well-being, equality and livelihoods
3. Outdoor recreation and learning
4. Nature conservation
5. Culture and heritage
6. Climate and energy
7. Natural resources
8. Legislation and policy

The Well-being of Future Generations (Wales) Act 2015 and The Environment (Wales) Act 2016 add further statutory backing to National Park purposes and the need for participation and collaboration to achieve them. However there is a two-way relationship between National Park purposes and the legislation. The topic areas are intended to reflect this complementarity, to demonstrate the alignment of National Park policy with Wales' well-being, climate, natural resource and ecosystem resilience goals, and to help identify opportunities to add value between national and local policy areas. The South-west and Marine area statements prepared by Natural Resources Wales will also be an important component of management.

[1] "In exercising or performing any functions in relation to, or so as to affect, land in a National Park, any relevant authority shall have regard to the purposes […] and, if it appears that there is a conflict between those purposes, shall attach greater weight to the purpose of conserving and enhancing the natural beauty, wildlife and cultural heritage of the area comprised in the National Park." (Environment Act 1995, s.62)

The background papers set out the state of the National Park and provide a context for identifying opportunities and challenges that the Management Plan will need to address. The opportunities and challenges, and accompanying maps, are set out in an informal document for early engagement with partners and public.

The background papers are technical in nature. Where use of technical terms is unavoidable, they are explained in the text and/or in a glossary.

A place-based approach

While many natural resource issues are best considered at a landscape-scale, action locally should take account of local circumstances. It is proposed that the Management Plan 2020-2024 adopts a place-based approach to policy implementation, with five areas identified as follows:

- Preseli Hills and North Coast
- North-west Coast
- West Coast
- Daugleddau
- South Coast

Next steps

An outline timetable for Management Plan preparation was approved in the Authority's Corporate and Resources Plan 2018/19 (page 33). A more detailed timetable is given below. This was approved by the National Park Authority at its meeting of 20th June 2018.

Milestone	By whom/when
Draft preparation timetable, and methods of engagement	Leadership Team, external bodies. May 2018
Approve timetable and engagement proposals	National Park Authority. June 2018
Engage with key stakeholders: • Collate evidence (outcomes, issues, policy impact) • Draft / revise Plan and associated assessments (see "Requirements for impact assessments" below) • Prepare an action planning framework	July to December 2018
Member Workshops to discuss draft reports and assessments	Spring 2019
Authority approval of consultation draft documents (Management Plan, Sustainability Appraisal / Strategic Environmental Assessment, Habitats Regulations Assessment, Equality Impact Assessment)	National Park Authority June 2019
Translation and formatting	June/July 2019
Public consultation (12 weeks)	Park Direction Team August 2019 - October 2019
Report of consultations to Authority. Authority approval of amended documents.	National Park Authority December 2019

Milestone	By whom/when
Translation and formatting	Park Direction/Graphics Team December 2019/ January 2020
Feedback to consultees	December 2019
Publication of approved Management Plan and assessments; formal notification / adoption statements.	January 2020

Opportunities and challenges identified from this background paper

Encouraging use of public transport and active travel.

Promoting waste efficiency through the waste hierarchy.

Supporting appropriate renewable energy development, including community schemes.

Managing climate change risks / impacts including those on coastal communities, ecosystems, natural resources, human and plant health, food security and infrastructure.

See also background papers 4: Nature conservation and 7. Natural resources.

1. Global greenhouse gas emissions

1.1 Global greenhouse gas emissions trends put the world on course for global temperature change in excess of 1.5°C, the level considered to constitute dangerous climate change (IPCC report *Global Warming of 1.5°C*, 2018).

1.2 Due to past emissions, the UK and Pembrokeshire are expected to experience higher average summer temperatures, lower average precipitation in summer and higher average precipitation in winter. The UK Government produced a UK Climate Change Risk Assessment in 2017. A regional report is available for Wales (see below).

1.3 The Paris Agreement (2015) reflects international ambition to limit the rise in global mean surface temperature to well below 2°C above pre-industrial levels, with efforts to hold it to 1.5°C, based on the knowledge that temperature increases of more than 2°C will result in very costly adaptation measures, huge impacts on water availability, food security and ecosystems and unacceptably high risks of irreversible events, such as the melting of the Greenland ice sheet and associated rise in relative sea level (a 1 metre rise is already predicted over the next century).

1.4 In 2018, Welsh Government consulted on *Achieving our low-carbon pathway to 2030*[2]. This presents initial thoughts on how to reduce greenhouse gas emissions by 45% by 2030.

1.5 The Environment (Wales) Act 2016 requires the Welsh Government to reduce emissions of greenhouse gases by at least 80% in 2050, against the 1990 baseline. Before then, the Act requires Welsh Government to set targets for 2020, 2030 and 2040 and carbon budgets (the amount of emissions Wales can produce in the years between our interim targets).

1.6 Welsh Ministers have received independent advice from the UK Committee on Climate Change on the interim targets and the first two carbon budgets (2016-20 and 2021-25). The science suggests that emissions must be cut further and faster, however circumstances in Wales make achieving an 80% reduction more challenging than the equivalent reduction for the UK as a whole. This is due to Wales having a greater share of 'hard to reduce' emissions, for example in agriculture and industry, and fewer suitable sites to store carbon dioxide.

1.7 Welsh Ministers have accepted the UK Committee on Climate Change's advice and set a more ambitious 2030 target than the EU's pledge under the Paris Agreement. Ministers will ask the Assembly to agree with a proposal to set the interim targets and the first two carbon budgets in regulations before the end of 2018 at the following levels:

- 2020: 27% reduction
- 2030: 45% reduction
- 2040: 67% reduction
- Carbon budget 1 (2016-20): Average of 23% reduction

[2] https://beta.gov.wales/sites/default/files/consultations/2018-08/low-carbon-pathway-to-2030-consultation.pdf

- Carbon budget 2 (2021-25): Average of 33% reduction

1.8 Annex B of the *Achieving our low-carbon pathway to 2030* consultation includes a list of potential actions to 2030. These include:

- Supporting the development of regional and local energy planning to address the supply, distribution, and use of energy
- Accelerating the deployment of renewable generation whilst encouraging local ownership
- Developing a charging network that encourages early take-up of electric vehicles
- Doubling the percentage of adults making cycling journeys at least once a week and increase the percentage of people making walking journeys at least once a week by 25% from the 2016 baseline
- Setting higher energy efficiency standards for new builds through reviewing Building Regulations Part L (Conservation of Fuel and Power)
- Developing a long-term residential retrofit programme based on evidence
- Delivering buildings that are more sustainable by using innovative construction techniques to reduce and meet the energy demand within buildings and increase the use of sustainable materials, such as timber
- Scoping out the challenges and opportunities around low-carbon heat
- Providing post-Brexit support in the form of a land management programme that contains a public goods scheme and an economic resilience scheme, replacing the Common Agricultural Policy with a framework that also links support to emissions reduction and removals
- Revising regulatory and support regimes to increase tree planting to at least 2,000 hectares per year, aiming to increase this to 4,000 hectares
- Identifying preferred areas for tree planting, including commercial woodlands and planting at medium and large scale
- Ensuring that all peatlands supporting semi natural habitats are under active management by 2030 by supporting, enabling and co-ordinating the restoration and sustainable management of peatland, as well as utilising and maximising associated funding opportunities

2. UK Climate Change Risk Assessment 2017 Evidence Report Summary for Wales

2.1 The latest set of projected changes in climate for Wales comes from the 2009 UK Climate Projections. Under a medium emissions (A1B) scenario, regional summer mean temperatures are projected to increase by between 0.9 - 4.5ºC by the 2050s compared to a 1961-1990 baseline. Regional winter precipitation totals are projected to vary between -2 - to +31% for the same scenario.

2.2 The average sea level for Cardiff is expected to increase by between 22.8 cm and 37.6 cm by 2090 compared to a 1990 baseline. Higher rates of sea level rise for the UK of up to 1.9 metres by 2100 have been modelled in a plausible high scenario, though this is considered highly unlikely to occur this century. However, sea levels are projected to continue to rise beyond 2100 even in lower emission scenarios and several meters of sea level rise within centuries is possible.

2.3 Climate change poses risks in Wales to soils, freshwater resources, natural carbon stores, marine ecosystems, farming, forestry, wildlife and habitats. More action is needed to manage these risks. More evidence is also needed to fully characterise other climate change risks that are likely to be important for the natural environment in Wales, including changes in agricultural and forestry productivity and land suitability, as well as the impacts to freshwater and marine species.

2.4 Example action areas:

- More action needed to reduce existing pressures, improve condition of habitats, restore degraded ecosystems, and deliver coherent ecological networks.
- More action to factor climate change into conservation planning and site management
- More action needed to deliver coherent ecological networks and to factor changes in species composition into site management.
- More action needed to reduce existing pressures on soils, increase uptake of soil conservation measures and restore degraded soils.
- More action needed to restore degraded carbon stores, particularly peatlands.
- Ensure climate change impacts on carbon stores are accounted for in the UK greenhouse gas inventory.
- More action needed to reduce pollution and over-abstraction and improve the ecological condition of water bodies
- Ensure decisions on use of water allow for necessary environmental flows and take account of climate change.
- Deliver wider uptake of natural flood management in high-risk catchments especially where there are likely to be carbon storage, water quality and biodiversity benefits.
- Continue to implement surveillance and bio-security measures.
- Continue to build resilience of ecosystems to drought, flood and fire
- Continue current efforts to manage and respond to wildfires.
- More action needed to deliver managed realignment of coastlines and create compensatory habitat.
- Monitor climate impacts on landscapes and ensure climate change is accounted for in future landscape character assessments.

2.5 Infrastructure across Wales is exposed to range of climate hazards. Impacts on some assets have the potential to cascade on to others as part of interdependent networks. Flooding poses the greatest long-term risk to infrastructure performance from climate change, but the growing risks from heat, water scarcity and slope instability caused by severe weather could be significant.

2.6 Example action areas:

- More action needed to manage increasing risk to existing infrastructure service networks (including flood and coastal erosion risk management infrastructure), from sea-level rise and increased rate of erosion.
- More action needed to deliver sustainable drainage systems, upgrade sewers where appropriate and tackle drivers of increasing surface runoff (e.g. impermeable surfacing in urban areas).
- New policies and stronger co-ordinated, cross-sector effort needed to deliver more ambitious reductions in water consumption and establish strategic planning of new water-supply infrastructure.
- Ensure appropriate siting of new infrastructure and use of cooling technologies.

2.7 The Climate Change Risk Assessment Evidence Report suggests that there are potential health benefits from warmer winters in Wales, but more action is needed to manage current risks to people from cold temperatures through addressing fuel poverty.

2.8 Example action areas:

- Policies do not exist at present to adapt homes or other buildings to higher temperatures projected for the future.
- Climate change is projected to reduce the health risks from cold, but the number of cold-related deaths is projected to decline only slightly due to the effects of an ageing population increasing the number of vulnerable people at risk. Further measures need to be taken in the next 5 years to tackle large numbers of cold homes and reduce cold effects on health, even with climate warming.
- Research is needed to better characterise the impacts from sea level rise on coastal communities, thresholds for viability, and what steps should be taken to engage and support affected communities.
- Climate-related hazards damage historic structures and sites now, but there is a lack of information on the scale of current and future risks, including for historic urban green spaces and gardens as well as structures.

2.9 Flooding and extreme weather events which damage assets and disrupt business operations pose the greatest risk to Welsh businesses now and in the future. This could be compounded by a lack of adaptive capacity. New regulations or other government intervention made necessary by climate change also poses an indirect risk to businesses.

2.10 Example action areas:

- Sustain current actions to create more flexible abstraction regimes and promote water efficiency among businesses.

2.11 Climate change will impact upon water security, agricultural production and economic resources around the world. These impacts can compound vulnerability in other countries, which can in turn exacerbate risks from conflict, migration, and humanitarian crises. The main risks arising for the UK from climate change overseas are through impacts on the food system, economic interests abroad, and increased demand for humanitarian aid.

2.12 Example action areas:

- At the present, there is no co-ordinated national approach to ensure the resilience of the UK food system. Coordinated approaches require broad participation across policy, industry and research.
- The UK may increase its comparative advantage in specific areas of agricultural production in the future.

3. Coastal risk

3.1 The main issues for landscape, recreation, conservation and settlement / infrastructure – policies in regard to National Park settlements are summarised below.

Location	0-20 years	20 – 50 years	50 – 100 years
Amroth	The number of socio-economic assets at risk from coastal erosion and flooding along this frontage are unlikely to be sufficient to justify public coastal erosion and flood risk management funding to upgrade existing defences or to provide new defences. Hold the line by maintaining existing defences for as long as possible. The risk of coastal flooding to properties and assets will increase over time as a result of climate change/sea level rise. Alternative adaptation measures (such as improved flood warning systems, individual property /asset flood resilience/protection measures or relocation/abandonment of properties/assets) are likely to be required from the short-term.		Once the defences reach the end of their effective life and it is no longer technically or socio-economically viable to continue maintenance, the policy will change to no-active intervention which will allow the shoreline to naturally evolve and retreat.
Wiseman's Bridge	Hold the line for as long as possible by maintaining existing defences to continue to manage coastal erosion risk and allow time for consultation to be undertaken and an exit strategy to be developed which may involve relocation of assets, if possible. It will not be possible to obtain public funding to upgrade defences, in response to sea level rise and therefore coastal flood risk to properties and other assets will increase over this period.	Once the defences fail or are no longer viable, the policy will change to no active intervention, allowing the coastline to respond naturally.	
Saundersfoot	Hold the line by maintaining existing	The medium term policy is to hold the line	Subject to further detailed

Location	0-20 years	20 – 50 years	50 – 100 years
	defences. During this period flood and coastal erosion risk to properties, assets and infrastructure will increase. It is unlikely that public coastal erosion and flood risk management funding will be available to upgrade existing defences in response to future climate change/sea-level rise, due to the limited number of socio-economic assets at risk. Private funding could be used to maintain/upgrade existing defences or to implement adaptation measures, subject to obtaining the necessary consents, licences and approvals. Alternative adaptation measures are likely to be required from the short-term, such as improved flood warning systems, individual property/asset flood resilience/protection measures or relocation/abandonment of properties/assets. A detailed study is required to investigate alternative options for future coastal erosion and flood risk management (including surface water flooding) and management of the amenity beach and	by maintaining existing defences (typically residual life 20-50 years and 50-100 years) to manage the risk of coastal erosion for as long as is sustainable and affordable. Flood and coastal erosion risk to properties, assets and infrastructure will continue to increase over time. It is unlikely that public coastal erosion and flood risk management funding will be available to upgrade existing defences in response to future climate change/sea-level rise, due to the limited number of socio-economic assets at risk. Private funding could be used to maintain/upgrade existing defences or to implement adaptation measures, subject to obtaining the necessary consents, licences and approvals. The policy is subject to further study to investigate the future risk under a range of future climate change/sea /eve/ rise scenario and the development and assessment of a range of alternative options for future coastal erosion and flood risk management (including surface water flooding) management including	investigation, consultation and the future availability of long-term funding the long-term policy for Saundersfoot may be managed realignment which could involve the provision of flood resilience measures for properties, assets and infrastructure in the centre of Saundersfoot and properties assets in areas such as The Strand. Private funding could be used to maintain/upgrad e existing defences, subject to obtaining the necessary consents, licences and approvals.

Location	0-20 years	20 – 50 years	50 – 100 years
	facilities at Saundersfoot.	adaptation measures such as Subject to further detailed investigation, consultation and the future availability of long-term funding the long-term policy for Saundersfoot may be managed realignment which could involve the provision of flood resilience measures for properties, assets and infrastructure in the centre of Saundersfoot and properties assets in areas such as The Strand. Private funding could be used to maintain/upgrade existing defences, subject to obtaining the necessary consents, licences and approvals. Improved flood warning systems, individual property / asset flood resilience/protection measures or relocation / abandonment of properties/assets and management of the amenity beach and facilities at Saundersfoot. The study should also include environmental assessment and socio-economic appraisal to investigate whether alternative funding is available for defence upgrading / improvement. Defence upgrading/improvement would be subject to obtaining the necessary consents,	

Location	0-20 years	20 – 50 years	50 – 100 years
		licences and approvals. It is unlikely that public coastal erosion and flood risk management funding will be available to upgrade existing defences in response to future climate change/sea-level rise, due to the limited number of socio-economic assets at risk.	
North Beach, Tenby	The policy is to hold the line through maintaining and upgrading defences to manage the risk of landslides and erosion to the cliff below The Norton and Crackwell Street. The undefended shore should be monitored to manage the risk of outflanking. It is assumed that the harbour structures will be maintained, which afford some shelter to the local shoreline. If required, flood resilience could be adopted for the harbour buildings. They may adapt by utilising the upper storey for storage and essentially abandoning the ground floors or finding a use which is unaffected by flooding.		
South Beach, Tenby	In order to continue to minimise the risk of erosion and flooding to hinterland assets, the policy is to manage the dunes as the primary defence, under a policy of managed realignment. This would enable the dune system to function naturally, but allow measures to be implemented to reduce the risk of a breach in the dunes.		
Lydstep Haven	It is not likely that continuing to reduce the risk of coastal erosion and flooding of this private frontage, comprising Lydstep Haven holiday village, would attract public funding. The short-term policy is to hold the line by maintaining existing defences as long as possible. This could enable alternative adaptation options to be considered, developed and implemented at the site such as the relocation of the holiday village assets.	Unless alternative funds are available, the policy will change to no active intervention, once defences are no longer viable. This would allow the coast to respond naturally. Private funding could be used to maintain/upgrade existing defences in the medium and long term, subject to obtaining necessary consents, licences and approvals. However, extension of these defences would not be permitted in order to conserve the conservation interests in the bay.	

Location	0-20 years	20 – 50 years	50 – 100 years
Freshwater East	Managed realignment to enable the dune system to function naturally, whilst allowing dune management, habitat management or to control recreational pressures to be undertaken, as required. The policy would not preclude maintenance of the isolated stretch of defences at the western end of the frontage, if alternative funds were available. However, any change in the defences would be subject to obtaining necessary consents, licences and approvals and may not be appropriate, given the SSSI and conservation interest within the bay.		
Angle Bay	No active intervention will allow the coast to evolve and retreat naturally with minimal interference. At Angle village due to the limited assets at risk, public coastal erosion and flood risk management funding is unlikely to be available to maintain/upgrade existing defences. It is recommended that suitable adaptation measures are implemented to reduce the risk of flooding to residential and non-residential properties and assets (such as improved flood warning, flood protection measures, flood resilience measures or the relocation of assets). Private landowners may wish to fund maintenance/improvement of existing defences or adaptation measures subject to obtaining the necessary consents, licences and approvals. This policy will allow maintenance or realignment of the access road to the lifeboat station, public house and properties, as required.		
Dale	Dale village includes residential and non-residential properties, tourist and amenity facilities, including a beach and sheltered bay which is used for various watersports. There may be opportunities to provide a more sustainable approach to managing coastal erosion and flood risk in this location whilst retaining the beach, which is likely to narrow as result of future climate change/sea-level rise and the existing defences. The policy is therefore to continue to hold the line by maintaining existing defences for as long as possible, whilst investigating managed realignment options, in consultation with the community. Due to the limited number of socio-economic assets at risk, upgrading of the existing defences is unlikely to attract public coastal erosion and flood risk management funding. There the risk of coastal erosion and flooding to existing properties and assets is likely to increase over time.		The long-term policy is to implement managed realignment through construction of a new set back defence, subject to consultation with the local community and further detailed studies and investigations including investigating potential funding sources.
St. Brides	Policy of no active intervention. Maintaining the naturalness of this area is the key driver. The management intent of the plan is, therefore not to intervene in the natural processes. There is the small community of St Brides, where there could be longer term risk to properties. This is seen as being manageable at a local scale. However, the plan recommends considering the removal of the wall		

Location	0-20 years	20 – 50 years	50 – 100 years
	along the back of this small bay to allow the development of a natural beach.		
St Brides to Little Haven road	No active intervention with a possible need to realign the road to Little Haven.		
Settlands Road	No active intervention. It is unlikely that defence of this frontage could be undertaken and continued over the long-term without significant impact of the nature conservation values of the area. Given that there is an alternative route between Broad Haven and Little Haven, works here are not felt to be justified. Throughout the period of the SMP there is a need to significantly rethink the road system throughout the area.		
Little Haven	Hold the line. Improvement to defences standard would be anticipated over the short and medium term. The use and structure of the lower village would need to be examined. The risk is that future defence would become unsustainable and may actually result in the loss of the important values of the village. At present there are a limited number of properties at risk, either directly from Still Water Level flooding or from wave overtopping. This number is not likely to increase substantially in the future. It will become increasingly difficult to maintain the existing line of defence without significantly separating the village from its important seafront and beach use. This situation depends critically on the rate of sea level rise. Higher defences would tend to restrict drainage from the stream and, taking account of the general findings of the CFMP that there is likely to be increased spate flooding from these streams, would exacerbate the problem. The policy for the frontage is therefore for continued management of the current defences over the first Epoch, but with the intent to allow realignment over the second and third Epochs.		Managed realignment. This is likely to result in loss of the existing road through the village and eventually loss due to erosion of possibly two properties along the frontage. Consideration would need to be given towards redesigning the lower part of the village to maintain its important aspect and foreshore use, together with the possible need to reconnect the two areas of the village by road. The main access to the village would be along Walton Hill. Whilst the intent would be to minimise and move back defences, this would not be a

Location	0-20 years	20 – 50 years	50 – 100 years
			policy of No Active Intervention as there would need to be consideration of how existing defences, such as those to the northern side of the stream, could be maintained and how properties on the lower part of Strawberry Hill could continue to receive some form of defence.
Broad Haven	Hold the line. The main issues at Broad Haven are in relation to maintaining its seafront; maintaining access to the village; and reducing flood risk to the southern part of the village. It is probably possible to sustain the defences along the whole frontage over the first two Epochs. The main road to the village is the B4341 along Millmoor Way. This provides access to the centre of the village. To the south of the village, Walton Road is the main access road. This joins the coast road just south of the car park and is therefore at slight risk from erosion or land slip. Even during the second Epoch there is going to be increased pressure on the central advanced section of defence. However, this is seen as being quite a critical section in maintaining the general position of the shoreline, both to north and south; it already forms a slight headland along the frontage, although it is evidently not designed to fulfil this function. There is increased risk of flooding directly from sea levels and from the stream to the south of the main village. This might be better managed if there was the opportunity to set back this frontage, linking through to the valley behind. This creates the opportunity to maintain important shoreline width. Consideration would		Managed realignment. Protecting the whole frontage on its current line is not expected to be justified in the long term. The option outlined above, of: holding the centre and reinforcing this as a promontory; maintaining and improving defence to the south by the slipway, but also allowing retreat over the area between, is seen as an opportunity to address this in a more sustainable manner.

Location	0-20 years	20 – 50 years	50 – 100 years
	then have to be given to the feasibility of re-constructing the road with a new bridge. This area of realignment could then be held to the southern end, by reinforcing the protection of the corner by the slipway; this would maintain the defence to the access road. It is important to start considering overall adaptation measures now, such that further development of the village, could be in line with future change to a more sustainable position.		In a similar manner, to the north, maintaining the central section as a promontory, with its higher ground behind but allowing the retreat at Haroldston Bridge would both create a more sustainable area of beach and foreshore, while also minimise cost of defence. The road over this section would be difficult to maintain in to the future and it is unlikely that its continued defence would be justified..
Nolton Haven	Hold the line. There are existing flood issues with the road. However, this is quite a critical position in the road network, with four routes converging and with development of the small village along each of these. The shape and orientation of the bay means that the southern corner gains a significant degree of shelter and that the main pressure for future erosion with Sea Level Rise is against the earth bank and dunes to the north	Managed realignment. It would also not be anticipated that defence was extended further along the soft earth bank section and indeed, maintaining the opportunity for this area to respond and erode naturally would be important in providing sediment to this enclosed bay. The overall intent would be to allow natural realignment but with the aim to encourage the build-up of the beach in front of the road; with the intent of not allowing loss of the road through erosion. The policies for the frontage would therefore be Managed Realignment.	

Location	0-20 years	20 – 50 years	50 – 100 years
	of the bay. It is considered that even with Sea Level Rise of 2m over the next 100 years, it would be sustainable to manage the existing defences in the vicinity of the road. It would not preclude significantly more regular flooding in the longer term over periods of high water.		
Newgale south	Managed realignment. Manage the realignment and loss to the road, while protecting access from the south. Maintaining the road across the valley is not seen as being a sustainable possibly much beyond the first Epoch. There may need to be some stabilisation works carried out to the southern cliff line to sustain the road in this local area. The intent would not be to maintain defence to this road into Epoch 3.		
Newgale north	Managed realignment. Manage shingle on the road but with the long-term intent of allowing the shingle ridge to behave naturally. Maintain access along the main road for as long as possible by shingle clearance. There is already monitoring of the work involved in taking this approach. It is anticipated, however, that during Epoch two this would not provide sufficient security to the road and that the road would, in effect, be lost. This would require significant planning to maintain access to the southern area of the St David's Peninsula. Along with the road, increased flooding to the valley is likely to make the properties and businesses untenable much beyond the start of the second Epoch. There would be a need to move the car park in land as the shingle bank rolls back, although the property under Pinch and West Hill, together with the old Lime Kiln is not seen as being at risk over the period of the SMP.		No active intervention.
Newgale Village	Managed realignment. At the main village of Newgale, the shingle would roll back, and although they would still have some protection from this shingle, the cliffs would eventually come under more pressure from Erosion. It is probable that there could be loss of property towards the end of the final Epoch. This erosion is not seen as putting the rest of the village at risk and there might be scope for some protection works, possibly in association with management of the stream. Over the whole section of Newgale,		

Location	0-20 years	20 – 50 years	50 – 100 years
	therefore, the intent would be to allow natural retreat of the shingle. Over the main valley frontage the intent would be eventually to create a situation where there was no need for intervention. This would require an initial policy of Managed Realignment over the first two Epochs. At the northern end the policy would be for Managed Realignment over all epochs, not precluding the potential need to defend the main core to the village.		
Lower Solva	Hold the line. It is considered possible to maintain both the area of the quay and the integrity of the walkway. Funding may be an important issue, however, and collaborative funding would need to be sought to maintain current use of the area. Such joint funding has already been accepted in the development of recent schemes. Over the next 50 years planning should be put in place to make properties more resilient to flooding, with the possibility of actually removing property from within the flood plain. This would need to be developed with the local community.		Managed realignment. Whilst it may be practical to raise defences to Lower Solva over the first two Epochs, continuing this policy into the future is not considered sustainable. The narrowness of the river channel, if substantially defended would create problems for catastrophic flooding should defences fail. It would also destroy the important landscape of the village.
Newport Parrog	Hold the line through local improvement to defences, addressing wave run-up on the slipways and improving flood defence locally to the back of the headland. At Newport, while the recent appraisal confirms significant economic justification for improving defences, the course then set of increasing the height of defences in line with Sea Level Rise is not seen as being sustainable and, even if manageable in the short to medium term, would not address the probable impact in the future. The approach of raising defences would in effect destroy the very values that are identified as being essential to the well-being of the area.		Managed realignment. The policy of the western section of the frontage is for Managed Realignment behind the rock outcrop. This would specifically support local private management of defences to

Location	0-20 years	20 – 50 years	50 – 100 years
			property but with no expectation of public funding. The intent would be to restore a natural beach to the frontage, which could be maintained sustainably over the next 100 years. Without this, the policy from Epoch three would be No Active Intervention.
Nyfer Estuary	No active intervention. There is only minor flood risk and erosion risk within the Nyfer Estuary. The intent of the plan would be to allow natural development of the estuary. This would not preclude local private defence that could be shown not to impact on the behaviour of the estuary.		
Newport Sands	Hold the line. Retreat defence line in balance with roll back of the Bennet. In the short term the defence is not seen as having a significant impact on the natural behaviour of the whole frontage and over Epoch one this defence could be maintained.	Managed realignment. The intent would be to manage the realignment of defences in terms of a stepped retreat. Management of this would depend on the importance associated with maintaining the car park and access.	No active intervention.

4. Shoreline Management Plan 2 – Risk Areas

4.1 The two Shoreline Management Plans covering the coast of Pembrokeshire are:

- The South Wales SMP2 covers the area from Amroth to St Anne's Head (January 2012; finalised 2014); and
- The West of Wales SMP2 covers the area from St Anne's Head to Cardigan (November 2011; finalised 2014).

4.2 The Plans divide the whole coast into cells and set out a preferred management policy for each cell, divided into 3 epochs, collectively looking forward 100 years. The policy approach for each cell is based on the current use of the land and the need to protect assets, whilst taking into account the continued ability to do so, taking into account physical and financial requirements within the context of climate change, including sea-level rise and increase storminess.

4.3 Of the allocations made in the current Local Development Plan, one is currently within a flood zone in Saundersfoot. The site has been granted planning permission and is under construction for residential and commercial use. The development of the site is being undertaken in accordance with the requirements of TAN15.
There are also a number of locations where parts of existing towns and villages and road links are likely to be liable to an increasing flood risk.

4.4 The approach now advocated by the Welsh Government is to develop and improve flood forecasting, warning, awareness, response and recovery, as well as flood defences. The SMP2s will identify areas where investment in the physical infrastructure is needed to improve resilience to flooding. They also highlight the locations where a longer term policy will needed to allow communities to adapt to a changing coastline, including in some isolated instances the need for abandonment of properties.

4.5 The areas within the National Park identified in the SMP2s as having immediate or longer term flood or erosion risk from the sea are:

a. Amroth (Increasing risk of flooding from present day. Eventual failure of defences in medium/long term)
b. Wiseman's Bridge (Need to develop an exit strategy which may involve relocation of assets in medium-term. Long-term public funding of defences is not viable).
c. Saundersfoot (Adaptation measures required from the short-term. Likelihood of increased frequency of flooding leading to managed realigned in the long-term.)
d. South Beach, Tenby (roll-back of the dunes will affect some assets in the medium to long-term)
e. Lydstep Haven (Existing defences have limited lifespan and the holiday park may require adaptation/relocation in the medium term.)
f. Freshwater East (roll-back of the dunes may affect some assets in the medium to long-term)
g. Angle (Evolution and retreat of the coast will lead to increased flooding for some properties and assets. Adaptation of properties required. Private funding will be required to maintain/realign the road to Angle Point.)

h. Dale (Hold the line for as long as possible by maintaining existing defences, but managed realignment necessary in the long-term.)
i. St Brides (Increased risk to properties in the long-term.)
j. St Brides to Little Haven road (may require realignment in the long-term.)
k. Settlands Road (potential loss of road in the long-term)
l. Little Haven (Hold the line in the short-term with managed realignment necessary thereafter which is likely to result in loss of the existing road and some properties along the frontage.)
m. Broad Haven (Increased pressure on existing defences will lead to increased frequency of flooding. Some managed retreat will be necessary along some of the frontage and potential loss of road to the north.)
n. Nolton Haven (Natural evolution of the bay will protect the road, but some loss of property along the frontage).
o. Newgale (loss of road, car park and properties as shingle bank rolls back from current time).
p. Solva (Hold the line in the short-term but managed realigned will be necessary in the future with the need to remove some properties from the flood plain.)
q. Whitesands (long-term realignment will result in loss of the car park).
r. Abereiddi (managed realigned has commenced. Replacement car park facilities are being considered.)
s. Newport Parrog (Managed realignment is necessary as existing defences are unlikely to be effective even in the short-term and no public funding available. A policy of no active intervention in the longer-term would restore a natural beach frontage.
t. Nyfer Estuary (allow natural development of the estuary that would not preclude local private defence, if appropriate).
u. Newport Sands (managed realignment of the defences with stepped retreat reverting to no active intervention in the long-term. This would impact the car park and access road.)

4.6 The information contained in the Shoreline Management Plans has been used to identify Coastal Change Management Areas in the Local Development Plan 2. The NPA has published Coastal Change Management Area maps for Tenby, Solva, Saundersfoot, Newport, Newgale, Little Haven, The Gann, Dale, Broad Haven, Angle, Amroth and Wiseman's Bridge.

5. Newgale Adaptation Plan (Final) (Pembrokeshire County Council, April 2015)

5.1 A report was commissioned by Pembrokeshire County Council and undertaken by Royal Haskoning DHV in December 2014 which concluded that management of the shingle bank at Newgale will be unsustainable in a timescale of 10-20 years. During this time the bank will become increasingly vulnerable to damage thereby posing a threat to the safety and security of residents in the lower part of Newgale village and to the road infrastructure linking to the St Davids peninsula. Preservation of the road link in its current location is highly unlikely in the medium term and the County Council with partners is now exploring options for the future with an initial consultation on the possible options in the spring of 2016.

5.2 The Adaptation Plan sets out a number of objectives which seek to inform residents and visitors of the need for adaptation; adapt the transport infrastructure and manage the impact on the local and wider community. As a result a number of actions are proposed:

- Identification of properties at risk;
- Preparation of a community flood risk plan;
- Identification of transport adaptation options;
- Ongoing management of the shingle bank
- Ongoing community engagement.

5.3 A study was commissioned by Pembrokeshire County Council to examine how the community of Newgale and surrounding areas can adapt to the changes being brought as a result. Feeding into the Adaptation Plan is an assessment of realignment options for the road. Initially in 2015, thirteen options were identified and following a public consultation exercise, this was reduced to 10 and then further to 4. In February 2016 the County Council appointed consultants, Atkins, to undertake the WelTAG Stage 1 appraisal of the 4 remaining options, resulting in 2 preferred options Further assessment of both options is being undertaken (March 2018).

5.4 The work to assess the need for and establish a route for a new road link at Newgale currently has no timescale. The Plan will need highlight the issues that are emerging and monitor progress. A revision of the flooding and Coastal Inundation section of the Plan is also being undertaken.

6. Renewable Energy

6.1 Issues identified in Annual Monitoring Reports[3] where action under the Management Plan may complement policies contained in the Local Development Plan include renewable energy generation.

6.2 The 2008 study 'Development of a Renewable Energy Assessment and Target Information for the Pembrokeshire Coast Local Development Plan' has been updated. The updated study concludes that, for technologies that would require planning permission, the generation potential of renewable electricity within the National Park has significantly increased and the potential for renewable heat energy has significantly decreased from the 2008 estimates.

6.3 Renewable Energy Supplementary Planning Guidance was adopted in October 2011 and provides a supportive context for renewables provision while protecting the special qualities of the National Park. Deciding applications contrary to this Supplementary Planning Guidance should trigger a review. During the most recent monitoring period (April 2016 to March 2017), the Renewable Energy Supplementary Planning Guidance was cited in four decisions, all of which were approved. These were for residential and commercial schemes which incorporated mainly solar technology within their designs. No decisions conflict with the Supplementary Planning Guidance.

6.4 There were no significant applications for wind turbines received within this period and as such, the 'Cumulative Impact of Wind Turbines on Landscape and Visual Amenity' Supplementary Planning Guidance has not been cited.

6.5 The policy context and supplementary planning guidance continues to provide a positive framework for renewable energy generation. Development interest for solar panels, biomass and anaerobic digestion still exists although demand for wind turbines has significantly decreased in the last three to four years.

[3] http://www.pembrokeshirecoast.wales/default.asp?PID=536