

Pembrokeshire Coast National Park Authority

Seascape Character Assessment



Supplementary Planning Guidance
to the Local Development Plan for the
Pembrokeshire Coast National Park

Adopted 11 December 2013



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Cover photo: Ramsey Island and Whitesands Bay from Carn Llidi

1. Introduction

- 1.1. The Pembrokeshire Coast National Park Authority has adopted the Pembrokeshire Coast National Park Local Development Plan (September 2010). This supplementary planning provides more detailed guidance on the way in which the Local Development Plan policies (in particular, Policy 8 Special Qualities and Policy 15 Conservation of the Pembrokeshire Coast National Park) are applied. Paragraph 5.7.1, of Planning Policy Wales advises that local planning authorities need to consider both landward and seaward pressures and the impacts of these pressures. The impacts associated with such activities can be widespread and may relate to inappropriate land use, pressure for services and facilities, and impacts on existing businesses and employment as well as the natural and historic character of the coastline.
- 1.2. While only the policies in the development plan have special status in deciding planning applications, (i.e. for the purpose of any determination under the Planning Acts, the determination must be made in accordance with the Plan unless material considerations indicate otherwise), Supplementary Planning Guidance may be taken into account as a material planning consideration.¹ In making decisions on matters that come before it, the Assembly Government and the Planning Inspectorate will give substantial weight to approved supplementary planning guidance which derives out of and has been prepared consistent with the approach set out in national policy on the preparation of Local Development Plans.² Put simply the requirements of the legislation mean that the following needs to be taken into account when considering a proposal:
 - Whether the proposal meets the requirements of policies within the Development Plan; and
 - Weigh up all the other planning considerations to see whether they outweigh the conclusion of the Development Plan.³
- 1.3. The seascape character assessment of Pembrokeshire Coast National Park includes territorial waters up to 12 nautical miles offshore and extends from Cardigan Island in the north to the Taf estuary in Carmarthen Bay in the south. The study area reaches inland to include the areas of Milford Haven outside the Park, and up to the tidal limits of the Daugleddau.
- 1.4. The study is at a local level and is set within the framework of the regional Welsh Seascapes study completed by CCW in 2009. The method for this study builds on current guidance but is tailored for the particular scale of assessment, for Pembrokeshire National Park and the study's location in Wales. It is the first local seascape study of its kind in Wales. There is an emphasis on an assessment of the coastal landscape's seascape character in its marine setting although wholly marine areas away from the coast are covered. As it is one of the pilot studies for all-Wales work there may be some further refinement, such as to boundaries, in order to marry up with adjacent seascape character assessments in future.

¹ Paragraph 5.2, page 33, Local Development Plans Wales, Policy on Preparation of Local Development Plans, Welsh Assembly Government, 2005

² Paragraph 5.3, page 33, Local Development Plans Wales, Policy on Preparation of Local Development Plans, Welsh Assembly Government, 2005

³ Page 27 <http://www.wlga.gov.uk/publications-and-consultation-responses-imp/planning-handbook-a-guide-for-local-authority-members/>

- 1.5. The study should also be read in conjunction with the National Park Management Plan and with other guidance and baseline information including the PCNPA Landscape Character Assessment (2011). At a national level, the Marine and Coastal Access Act 2009 requires the Welsh Government to develop a spatial planning approach to the management of its marine areas and the study may help to inform this.
- 1.6. The report explains the method, gives an overview of the seascape, sets out the cultural benefits and services, the forces for change and the key sensitivities. Each seascape character area is described in turn.
- 1.7. The inland boundary of the study area is defined by identifying those areas of coast which have the highest intervisibility with the sea or water body in the case of Milford Haven and the Daugleddau.
- 1.8. A large number of datasets have been analysed to inform the study. Key factors are used to define types and areas while the rest are used to describe the seascape. The process followed is to define seascape character types as 'building blocks' and then define and describe seascape character areas based on these types. Site visits have helped to verify desk-based work and describe perceptual and experiential qualities.
- 1.9. The seascape types are divided into marine, intertidal and terrestrial. 21 marine types are defined based on physical characteristics of bathymetry, sea bed sediments and bedrock, and wave climate. Five intertidal types are based on rock, sand/shingle, mud, saltmarsh and biogenic reefs habitats. Twenty one terrestrial types are defined based on coastal habitats such as sand dunes, 'inland' habitats close to the coast such as mixed woodland and scrub and land uses such as different types of built up areas.
- 1.10. 44 Seascape character areas are defined by bringing together related marine, intertidal and terrestrial types on the coast, and broadly similar marine types offshore. Each area is described in terms of its key characteristics, physical influences, cultural influences and aesthetic, perceptual and experiential qualities. Its cultural benefits and services and key sensitivities are defined and the main forces for change affecting the area discussed.
- 1.11. The study area is on Great Britain's remote western seaboard facing and including parts of the Atlantic Ocean/Celtic Sea, St George's Channel, Cardigan Bay and the Bristol Channel. The sea and coast are exposed to, and often governed by, the prevailing south westerlies. The maritime weather conditions combined with the depth of the sea and nature of the sea bed essentially define the character of the marine areas. The remote and exposed islands and islets with associated reefs and isolated lighthouses are key features of the Pembrokeshire seascape. The coast's distinctive and varied rock formations interact with the force of the sea and weather to create a wide range of dramatic coastal seascapes. Inland, Milford Haven and the Daugleddau provide contrasting sheltered seascapes, penetrating deep into Pembrokeshire's countryside.
- 1.12. Seascape character is enhanced by diverse marine and coastal habitats and wildlife of international and national importance including cetaceans eg dolphins and coastal birds eg puffins and choughs. Prehistoric promontory forts, more recent military installations, religious buildings, harbours and other historic features and wrecks indicate the area's strong connection to ancient seaways and reinforce its strong sense of place.
- 1.13. The area's qualities attract tourism and leisure pursuits, which make an important contribution to the local economy and character, but can also lead to pressures on the coast and sea. The energy and related industry, both carbon

based eg liquid natural gas, and developing renewables, are further forces for change with potentially strong influences on character. Traditional uses such as fishing, particularly potting, still contribute to the local economy and character.

- 1.14. The report is structured to first to explain the method used [2.0], to go on to give an overview of the seascape of Pembrokeshire [3.0], to set out the cultural benefits and services of the seascape [4.0], the forces for change [5.0] and the sensitivities [6.0]. Then, each seascape character area is described in turn [8.0]. The appendices deal with the information and approach underpinning the study- the data available and used, seascape character typology, and background information relating to cultural benefits and services, forces for change and factors influencing the sensitivity of seascape, aesthetic and perceptual factors and a glossary.
- 1.15. The study area is indicated on **Figure 1**. The method for deriving the landward boundary is explained in the method.



St Justinians from Ramsey Sound

2. Method

Development of seascape character assessment methodology

- 2.1. The method for this study seeks to build on current guidance but is tailored for the particular scale of assessment, for Pembrokeshire National Park and the study's location in Wales. It is the first local seascape study of its kind in Wales and may help set the pattern for future local studies. The brief is clear in its emphasis on an assessment of the coastal landscape's seascape character in its marine setting although wholly marine areas away from the coast require coverage, and many are intervisible with the coast in any case.
- 2.2. The terms used in the study are to be found in the Glossary in **Appendix G**. This uses terms primarily defined by the latest SCA and LCA guidance. Other sources include the European Landscape Convention, and LANDMAP to ensure that there is compatibility with existing assessments in the Welsh context.
- 2.3. The study lies within the context and framework of the regional seascape character assessment 'Welsh seascapes and their sensitivity to offshore developments' which was carried out broadly in line with CCW led 2001 seascape guidance. Further seascape character guidance has since been developed, led by Natural England, based on a study off Dorset, and this provides useful guidance on the marine element of seascape. A concise form of the document has been issued which is supplemented by pilot study testing of the method and recommendations on the south and east coast of England. In Wales, a pilot study for CCW in NW Anglesey in 2012 has tested the use of different information to define types and character areas at a regional and local level.
- 2.4. The relevant seascape guidance mentioned above and taken into account by this study is as follows, in date order:
 - Guide to best practice in seascape assessment, Hill et al, Countryside Council for Wales and University College, Dublin, Brady Shipman Martin, 2001.
 - Guidance on the assessment of the impact of offshore windfarms: seascape and visual impact report, Enviros, DTI, 2005.
 - An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms, University of Newcastle, Commissioned Report no. 103, Scottish Natural Heritage, 2005.
 - Welsh seascapes and their sensitivity to offshore developments, Briggs, J.H.W. & White, S, CCW Policy Research Report No. 08/5, January 2009.
 - Dorset Coast Landscape and Seascape Character Assessment, LDA, C-SCOPE, 2010.
 - An approach to Seascape Character Assessment, (NECR105), Natural England, Scottish Natural Heritage and Countryside Council for Wales, 2012.
 - Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study) (NECR106), Natural England, 2012.
- 2.5. In terms of status the 2001 CCW guidance still applies and is reinforced by the 2005 seascape guidance. The 2012 approach is advisory and focuses primarily on England. However, it builds on developing good practice and gives flexibility of approach and so all guidance will be taken into account.
- 2.6. The scale of the assessment is at local authority level. In Wales, there are three levels or scales of assessment- National, Regional and Local scale. The Regional

study has been undertaken, as discussed, and this study provides the Local level. In England, there are four levels with the most detailed/lowest level also named 'local scale'. However, this addresses individual bays, coves or rocky coastlines. This is considered to be at a greater level of detail than required for this study and equates more with detailed Shoreline Management Plan areas on the coast.

- 2.7. Other guidance prepared primarily for landscape and visual assessment is also relevant to this study. It is important to ensure that terms and approaches to seascape are the same as for landscape insofar as the substantially different qualities of the two environments allow. Relevant publications include:
- Skye and Lochalsh landscape assessment, Stanton, C. Scottish Natural Heritage Review No.71, 1996.
 - Guidelines for Landscape and Visual Impact Assessment, second edition, Landscape Institute and Institute of Environmental Assessment, 2002.
 - Landscape Character Assessment, Guidance for England and Scotland, Swanwick, Carys and LUC, Scottish Natural Heritage with the Countryside Agency, 2002.
 - Topic Paper 6 Techniques and criteria for judging Capacity and Sensitivity, Countryside Agency, Carys Swanwick and LUC, 2003.
 - The LANDMAP Information System, Countryside Council for Wales, March 2012.
 - Landscape Character Assessment, Guidance for England, Scotland and Wales (consultation draft), LUC, Natural England, Scottish Natural Heritage and Countryside Council for Wales, 2011.
- 2.8. Many of these publications are to be updated shortly but it is understood that the principles relevant to this study are likely to remain unchanged. They are referred to in the text and appendices as appropriate below.

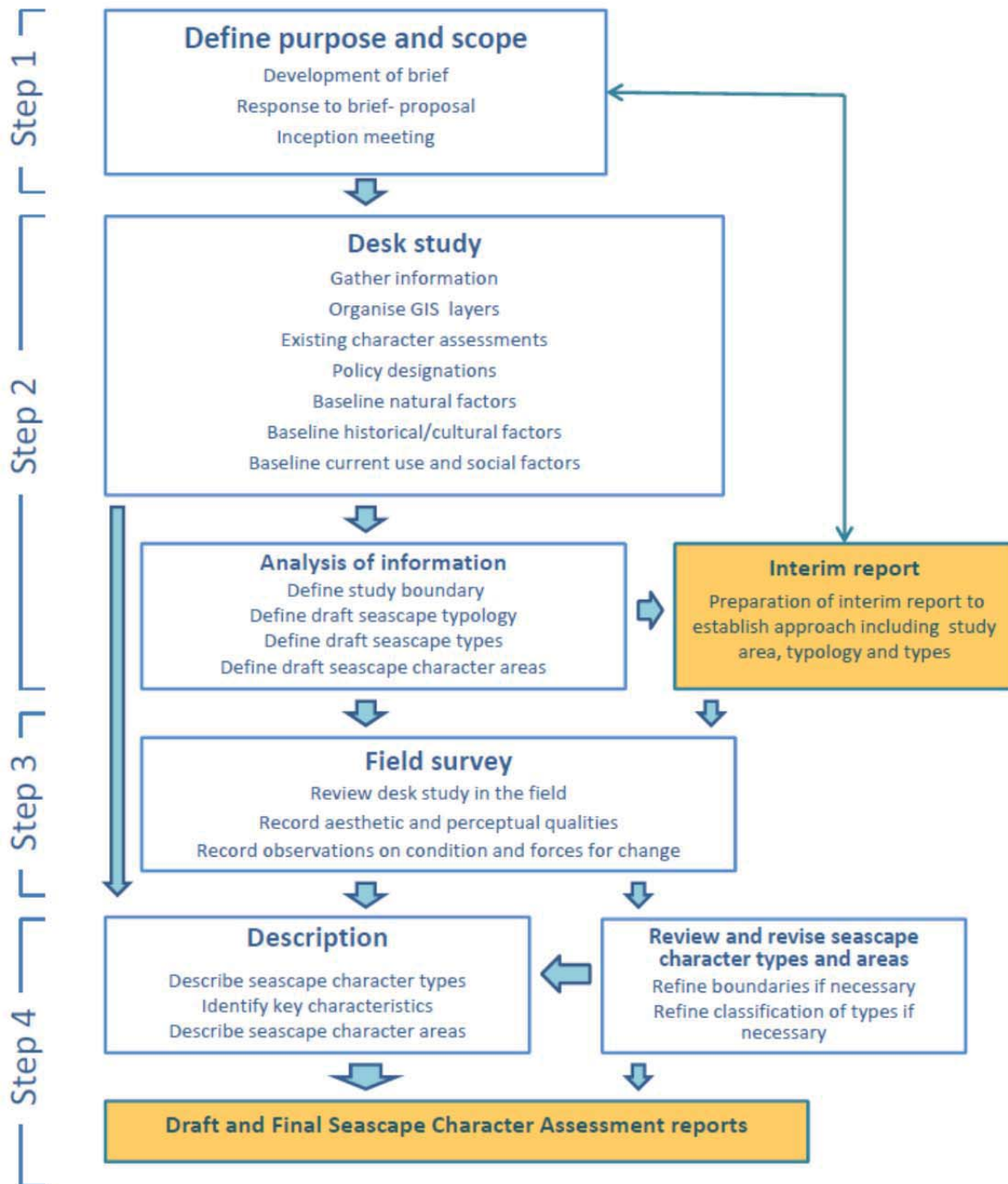
Approach to collection of data and mapping

- 2.9. Data for the study has been provided by CCW, PCNPA and Pembrokeshire Coastal Forum as defined in **Appendix A**. The data provided and suggested from other sources covers a very large range of information. Some of the data has been found to be essential for defining SCTs whilst other data has been useful in defining SCAs and assisting in their description. Not all marine data necessary has been available and some time has been needed to explore sources and availability. It is hoped that this study defines more clearly what is required for an SCA. The Appendix notes the key datasets.
- 2.10. Some GIS information from parties other than CCW include:
- Conservation areas- Pembrokeshire Coast National Park
 - Wales Activity Mapping- recreational activity available from Pembrokeshire Coastal Forum (PCF) acquired at an additional cost.
- 2.11. Non-GIS information from the UK Coastal Atlas for Recreational Boating prepared by the Royal Yacht Association (RYA) has been used in descriptions of marine use of each SCA. Seazone GIS and web data (including www.wrecksite.eu) on marine wrecks has provided information in sufficient detail to make unnecessary the use of chargeable data from Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

Study process

- 2.12. A flow diagram of the process is shown in **Figure A**. This shows the series of tasks and reporting undertaken.

Figure A: Flow Chart of Study Process



2.13. The interim report was important to set out the framework for the assessment and to define a typology. Feedback from the client steering group then informed the refinement of the SCTs and definition of SCAs. In practice there has been an ongoing dialogue between the consultant team and client to guide study boundaries, SCAs, SCA descriptions and presentation. This has proved invaluable.

2.14. A multi-disciplinary team has addressed the various aspects of the assessment coordinated by a landscape architect/seascape specialist. The aspects have

included geology/marine and coastal processes, cultural and historical factors, marine and coastal uses including tourism and recreation, seascape, landscape and visual factors and GIS. GIS has been used to help define the SCTs as mentioned above and expanded on below. Existing studies and GIS datasets have been used to provide the basis for the boundaries, context and description for each SCA. In practice, the study has been iterative with refinement of boundaries and descriptions dependent on information feeding into the process.

- 2.15. Site survey work has been undertaken by two seascape specialists. The purpose has been to refine SCA boundaries if necessary, to explore aesthetic and perceptual qualities and to note forces for change and potential sensitivities. Representative viewpoint locations have been chosen, coinciding with SCAs and their boundaries where possible to optimise efficiency. Structured fieldwork sheets have allowed the characteristics and use of the area to be noted as well as the aesthetic and perceptual experience. A sample is shown in Appendix H. Representative photographs have been taken from each viewpoint except on a few occasions when rain prevented this. The site visits in the winter season has meant that the area has been observed when not being used as fully as in the summer and weather and poor sea conditions have led to survey work being primarily onshore. This is mitigated by the team's local knowledge through living and working in the area and by datasets such as the Welsh Activity Mapping [WAM] dataset. The coastal visits have covered the majority of the coast and Daugleddau/Milford Haven, omitting only a small number of areas for which the study team had prior detailed knowledge through previous site work for other landscape or seascape related projects or through leisure use over a long period. The site visits were generally carried out in acceptable visibility for LCA/SCA work although there were intermittent periods of rain as already noted. One sea trip was undertaken which ran from Milford marina out to the middle of St Brides Bay covering intermediate areas including SCAs 24, 25, 26, 28, 31 and 32. This has given an indication of sea conditions, marine seascape character and the visibility and perception of the coast and its influence at different distances. Team members have previously travelled across Ramsey Sound as part of an SVIA and around Ramsey Island [SCAs 17 and 18]. Overall, the combination of site visits, knowledge of the area and desk study is considered to have been sufficient to inform the study to the appropriate level of detail.

Defining boundaries

- 2.16. The parameters governing the study area boundaries are defined in Appendix 2 of the brief. In terms of the marine extent, we include regional seascape units 28-41 to include the National Park and its setting. The study area is 12 nautical miles (nm) out from the coast and islands such as the Smalls, defined by a line 90 degrees from the coast from Cardigan Island to the north and Pendine Sands to the south east [see **Figure1**].
- 2.17. Discussion of the inland extent with the client steering group at the inception meeting indicated a desire that the inland boundary should include land which has a strong visual relationship with the sea/tidal waters, not just coastal landscape character types such as dunes or cliffs. Areas with some intervisibility with the coast could be excluded. The inland extent has therefore been defined by overlaying 1:25,000 OS mapping, the LANDMAP visual and sensory layer, the CCW dataset of land with intervisibility with the sea and Phase 1 intertidal habitats which define the tidal limits. Google Earth with Street View has further informed boundaries.
- 2.18. Initially areas with a high intervisibility with the sea were mapped (red or orange graded squares in the mapping). This line sometimes went inland, eg at Mynydd Carningli, and sometimes ran close to the coast where there was a coastal

plateau. For the areas bounding the Milford Haven, areas of lower visibility (blue squares) were marked as they only had views of the inland waters rather than the open sea and therefore would have a lower rating. Nevertheless they would contribute to seascape. Areas with visibility of the sea but not connected to the coast or with weaker intervisibility were not included. These coarse boundaries were then refined by studying and responding to the landform including high points and ridgelines. The extents of the tidal areas were then checked so that they were included in the study area. The boundaries were then rechecked against the visibility mapping and using Google Earth street view in areas of uncertainty. In some areas such as peninsulas [ie Marloes and the western end of the St David's peninsula] all land has been included due to the highly maritime, exposed character of the landscape. The terrestrial types have been defined up to this inland boundary.

Deriving seascape character types (SCTs)

- 2.19. A draft typology of marine, intertidal and seascape character types with a proposed nomenclature was prepared and submitted as part of the interim report. This built on the CCW pilot study in Anglesey/North Wales, knowledge of Wales seascapes and coastline overall, LANDMAP and of the Pembrokeshire marine and coastal environment. It also reflected the requirements of the brief. A different approach was taken for each of the three categories which is explained below.

Deriving Marine SCTs

- 2.20. The marine SCTs differ from the NECR105⁴ approach as they form 'building blocks' from which the proposed SCAs will amalgamate. (In NECR105, types are generic classifications which may cover a number of large areas which themselves are individual SCAs.) The types are also proposed to be at one level, the local authority level, reaching out to sea the full 12nm offshore. This is because the Regional seascape study has used a different approach to the marine element of the study area and it is considered that confusion may result if these areas/units were also called 'regional'. This also differs from the 2001 CCW guidance which suggested that seascape assessment should only reach 1nm offshore.
- 2.21. The SCTs extend from the 12 nm limit to the edge of the intertidal types which were defined first. It was decided that the prime drivers of difference in marine character were the physical characteristics of bathymetry, sea bed sediments and bedrock, and wave climate. From this, other secondary characteristics would flow such as sea use which has been used as a contributor to the definition of types elsewhere. For instance, sandbanks would tend to have shallow water and higher waves and would be avoided by boats/shipping. Deep water high wave coasts would tend to be avoided or used in a limited way eg Strumble Head coastal waters. Coarse sediment or bare rock on the sea bed such as in Ramsey Sound indicates higher water energy whilst fine sediments such as mud indicate low energy, such as the middle of St Bride's Bay, where tankers anchor. The three main drivers were subdivided as follows:
- Shallow depths 0-30m, moderate depths 30-60m, and deeper waters >60m.
 - Sea bed sediments ranging in grain size from gravel to sand to mud and bedrock exposed on the sea floor towards islands/islets. Sea floor

⁴ An approach to Seascape Character Assessment, (NECR105), Natural England, Scottish Natural Heritage and Countryside Council for Wales, 2012.

sediment is contributed to by erosion, lost through depositional processes, and may be transported by currents along the coastline.

- Wave climate - relating to exposure (wind), tidal and current conditions

2.22. The following data has been used to inform the classification:

- BGS Bath250- for Bathymetry/depths of water- available via CCW
- BGS DigMap250- for sediment seabed geology- available from BGS eventually via CCW.
- Wave climate from data obtained for CCW by LUC in a pilot study.

2.23. Types were defined and then further qualities were added to each type to further inform potential seascape character area boundaries. These were:

- Sea floor topography - slopes, channels/troughs, islets.
- Turbulence
- Bedrock type

2.24. The typology was tested on two pilot study areas: Ramsey Sound and the mouth of Milford Haven. The technique picked up a mix of fine grain areas such as the three types in the tidal strait of Ramsey Sound, which slopes into a central trough and is more steeply shelved and sheltered on the west side than the east. Similarly, the area across the islets W of Ramsey has NE-SW lines of islets flanked by shallow slopes, controlled by igneous bedrock geology, and separated by a deeper channel presumably used by shipping. In the Milford test area, the seaward limit of the estuary mouth was placed at the 30m depth contour which also subsequently was found to coincide with the extent of the Milford Haven Harbour Authority Area. The types therefore appeared to usefully differentiate areas as a suitable building block for SCAs.

2.25. There are 26 marine types spread across 81 defined SCTs. The relationship between the drivers/factors can be discerned in **Figures 2, 3 and 4** and the numbered SCTs are summarised in **Figure 14**.

Deriving Intertidal SCTs

2.26. The brief stated that Intertidal types should be defined by the Phase 1 habitat intertidal dataset. This is an extremely detailed, fine grain and apparently accurate dataset and was therefore used to define the limits of the marine and terrestrial types on either side. As the dataset was quite complex such as differentiating between different types of rocks in narrow bands along rocky shores (eg high, medium and low energy littoral rocks) it was decided to amalgamate these into simpler categories which make sense at a seascape scale. The types were defined as:

- Mud
- Sand and shingle
- Rock
- Saltmarsh or saline reedbed
- Biogenic reef.

Deriving Terrestrial SCTs

2.27. Terrestrial types are based on LANDMAP Landscape Habitat aspect Level 3 layer which complements the intertidal layer in terms of its Phase 1 derived source material but is at a larger, landscape scale. The aspect areas have been rationalised and amended to obtain a reasonable grain of landcover definition

without new digitising. This has meant that small scale settlements have not been defined but these are considered within the SCA description. The types are defined as:

- Sand Dune
- Beach/rough ground above High Water Mark
- Coastal heath and grassland mosaic
- Maritime cliff and slope
- Grassland and semi-natural mosaic
- Grassland mosaic (MOD range)
- Tall Herb and Fern (Bracken)
- Heathland
- Broadleaved woodland and scrub
- Mixed woodland and scrub
- Coniferous forest
- Woodland mosaic
- Mixed farmland
- Mixed farmland and woodland
- Improved grassland with woodland
- Pastoral farmland
- Grazing marsh
- Wet mosaic
- Mire and Swamp
- Open water
- Built up area
- Built up (industrial)
- Built up (port)
- Built up (resort)
- Amenity

Overall comments on types

- 2.28. The full typology is as set out in **Appendix B**. The types reflect the scale and character of the underlying seascape/landscape. Marine types are generally larger scale further from the coast with smaller areas along more complex stretches of coast such as around islands. Intertidal types are generally very narrow, especially along rocky coasts and are not apparent on larger scale maps. Terrestrial types vary in scale with farmland and pastoral types covering large areas of hinterland extending to the coast in places. There are smaller areas of the important coastal and dry mosaic areas dominated by semi-natural habitats.

Deriving Seascape Character Areas

- 2.29. The boundaries of the seascape character areas [SCAs] have been primarily driven by the marine SCTs as these define the character of both the marine areas and the coast with different geological formations. These in turn dictate

coastal and sea use to a large extent. The brief required coastal SCAs to include coast and marine components along with the relevant hinterland. Purely marine SCAs were also expected. The boundaries of each coastal SCA running inland is primarily defined by landform and geology or the viewshed separating adjacent SCAs. The intertidal and terrestrial types have generally not been definitive in determining boundaries and SCA boundaries therefore divide up these types which have been split in GIS layers as requested by the brief. The types have informed the descriptions for each SCA.

- 2.30. The SCA boundaries overlap regional seascape area boundaries as the latter relate to visual divisions based mainly on major headlands rather than on the detailed character of the coast itself. For instance, the strong distinctive headland of Dinas Head, with its shallow conglomerate seabed, is proposed as a local SCA in itself but is divided into two by the Regional Study as it is a dividing line between Fishguard and Newport Bays. This is an acceptable approach on both counts as the two assessments have different purposes. The regional study is mainly focussed on the visual relationship between sea and land and the potential effects of offshore development with units nominally extending out to sea 24km and inland 10km. The local study is primarily concerned with the inherent qualities and characteristics of smaller coastal and marine areas. The headland and associated sea is different in character from the more sheltered bays either side.

Aesthetic and perceptual factors

- 2.31. Aesthetic and perceptual factors are important in undertaking a character assessment. This information cannot be fully researched as part of the desk study and so has been collected as part of the site survey. Whilst aesthetic terms can be collected in a reasonably objective way, perceptual terms are more subjective. Both rely on the professional judgement of the surveyor. The assessment is structure in a systematic way to produce as consistent a survey as possible. In order to achieve this, each term has been defined and a sample illustration prepared for aesthetic terms. The latter cannot hope to capture all instances but relates to certain scenarios which may occur in the study area. The terms have been used as a checklist for the site survey forms/SCA descriptions. They derive from seascape guidance in England and Wales, landscape character guidance and the Skye and Lochalsh landscape character assessment (LCA). The definitions are derived and adapted from LANDMAP guidance (2003) where possible to try to achieve consistency between the assessments. The proposed terms and definitions are shown in Appendix F.



Barafundle Bay

3. Overview of the Pembrokeshire Seascape

- 3.1. The LDP provides a suitable introduction to the Pembrokeshire Coast National Park seascape stating that it:

'is widely recognised as Britain's only predominantly coastal National Park. The splendour of its coastline, the influence of the seascape, its spectacular scenery, and rugged, unspoilt beauty, provide a scenic quality which was recognised in its designation as a National Park along with the spectacle of the islands off the Pembrokeshire coast.' [4.58]

- 3.2. The study area coastal boundary runs from the Cardigan Island on Cardigan Bay to the north to the Taf estuary area on Carmarthen Bay to the south. It is on Great Britain's remote western seaboard facing the Atlantic Ocean/Celtic Sea due west, St George's Channel to the north east, Cardigan Bay to the north, and Bristol Channel to the south east and east. The sea and coast are exposed to, and often governed by, the prevailing south westerlies. The area's resulting distinctive maritime climate means the weather is almost always different from that occurring further east in the UK. The area's distinctive and varied rock formations interact with the force of the sea and weather to create a wide range of dramatic seascapes.

Physical influences

GEOLOGY AND COASTAL FORM

- 3.3. Pembrokeshire has virtually continuous exposure of rocks in cliffs, headlands and bays around its long coastline. It is an area rich in rock types and formations, with varied character and used extensively for the study of geology.
- 3.4. The rock succession spans from late Precambrian (<650 Ma (million years ago)) to late Palaeozoic (285 Ma). The offshore bedrock, beneath the sea floor sediments, is overlain by younger rocks. The rocks in Pembrokeshire show the effects of ancient mountain building episodes that uplifted, deformed and eroded rocks, leaving characteristic structural trends that control the direction of the landform. More recently, repeated glaciations have further shaped the landscape leaving sediment deposits. In the last glaciation (18,500 years ago) north Pembrokeshire to St Bride's Bay was covered by ice, but southern Pembrokeshire remained ice-free.
- 3.5. Precambrian rocks are exposed only in small areas along the southern St David's peninsula. They comprise metamorphosed sedimentary rocks and intrusions. Cambrian marine sandstones and shales are also well exposed on the St David's peninsula e.g. Solva. In the Ordovician era, thick successions of deeper water shales with graptolites (e.g. Aberiddi), and turbidites (e.g. Poppit Sands) were deposited with high cliffs on the north coast reaching 150mAOD around Pen yr Afr. Spectacular Ordovician sandstone cliffs reach 140mAOD around Penbwchdy. There was also widespread volcanic eruption and intrusion of magmas. The resistant igneous rocks include the spectacular pillow lavas of Strumble Head with cliffs 50mAOD high, the rhyolitic rocks on Ramsey Island, and form prominent tors (e.g. Carn Llidi at 181mAOD high -St David's Head gabbro, Garn Fawr at 213mAOD high and Penbiri). The islets of the Bishops and Clerks are mostly igneous, representing continuation of this pattern into offshore areas. Local volcanic activity centred on Skomer Island. The Marloes peninsula has extensive coastal exposure of these rocks, while their offshore continuation is shown by the islands/islets of Skomer, Grassholm and the Smalls. The siltstones, limestones and sandstones of the period were formed in warm shallow, fossiliferous seas (brachiopods, corals). Towards the end of the Silurian a

transition from marine to non-marine conditions is shown by the change to red-bed deposition of the Old Red Sandstone (e.g. St Anne's Head at 46mAOD high, Freshwater West with its wave cut platform, Freshwater East and Pendine). This continues into the Devonian, represented by red sandstones and mudstones laid down on coastal plains, mudflats, salt marshes and in braided rivers. These terrestrial environments were inhabited by early plants, armoured fish and amphibians. The collision of continents created folds and faults which is widely evident in the cliffs of north Pembrokeshire (e.g. Abereididi Bay).



High cliffs at Penbwchdy

- 3.6. Upper Devonian sedimentation continued in red beds, representing sediment deposited in rivers and on floodplains as the mountains eroded. The Carboniferous saw a return to marine conditions, with the Carboniferous Limestone laid down with shoals and lagoons (rich in corals, brachiopods). The Limestone forms prominent headlands and is exposed in steep coastal cliffs in south Pembrokeshire (e.g. Linney Head at 40mAOD high, Trevellen, Stackpole at 35mAOD high). This limestone coast displays distinctive erosion features such as stacks, caves, arches and blowholes. In mid to late Carboniferous times sedimentation changed to sandstones and mudstones of rivers and delta plains vegetated by giant ferns and horsetails. The peat swamps form the source for coals of the Coal Measures (Pembrokeshire Coalfield). Further continental collision led to the uplift resulting in east-west folds and faults, well seen in south Pembrokeshire (e.g. Ladies anticline at Saundersfoot, Stackpole, West Angle Bay).



Carboniferous limestone cliffs: Whitesheet Rock

- 3.7. Younger rocks (Permian, Mesozoic and Cenozoic) are preserved in the offshore bedrock. Triassic terrestrial sandstones, and Jurassic marine mudstones and limestones, are comparable to the rocks seen along the Vale of Glamorgan coast. Triassic rocks form the offshore bedrock in the Bristol Channel SCAs. They are cut by many east-west stretching faults formed during subsidence of the Bristol Channel basin. Cretaceous sea levels were exceptionally high, and the coastal plateaus of headlands in west Pembrokeshire (e.g. seen from tors like Carn Llidi) may represent wave cut platforms from that time. Cenozoic rocks - sandstones, mudstones and lignites - form offshore bedrock in the west of the study area. Uplift led to sea levels higher than today over Pembrokeshire, leading to marine erosion that shaped the present landscape. Offshore bedrock is faulted north east-south west, and north west-south east. The Milford Haven Cleddau estuary drainage system formed at this time.
- 3.8. Quaternary glaciations over the past <450,000 years led to Irish Sea ice crossing into western Britain to various extents. Sea levels in glacial and interglacial periods ranged <50 m lower to <5 m higher than today across Pembrokeshire. A glacial meltwater channel is preserved at Cwm Deri by Dinas Head, while the raised shingle beach behind Newgale represents interglacial sea level rise.

MARINE AND COASTAL PROCESSES

- 3.9. Coastal processes today continue the modification of coastal form and seascape character. Processes include wave action, sediment movement on-offshore or along the shore [longshore drift] and fluvial sediment supply from rivers into estuaries. Wind and wave action cause erosion through abrasion, attrition and hydraulic action and transport and deposit sediment through traction, saltation and suspension. The prevailing south westerlies and movements of tides and currents cause wave and wind erosion particularly on the exposed west facing coasts. The protruding St David's Peninsula and Ramsey and the Marloes Peninsula and Skomer with associated islets are an indication of the harder rocks, still battered by high energy waves. The softer rocks comprising the deep St Brides's Bay coast between continue to erode faster as do the dunes in exposed locations such as Freshwater West. Shores where sedimentation occurs include Carmarthen Bay also accumulating from sediment from the Taf/Twyi estuary. Longshore drift occurs along the southern coast generally from west to east with groynes installed to attempt to control this around Amroth. Currents between islands keep these scoured with the central channel in Ramsey Sound eroded to a great depth.
- 3.10. The sea has a very wide tidal range typically between 4.1m to the north at the Teifi estuary, 5.5m at Ramsey Sound and 6.6m east of Milford Haven. At high water (HW) the tidal flow is from east to west along the Bristol Channel and from the north east along St George's Channel. Tidal flows reach their maximum three hours before HW where flows run east west along the Bristol Channel and sweep north round into St George's Channel and Cardigan Bay. The flow is reversed three hours after HW where flows are strongly in the opposite direction. This causes turbulence in some areas such as around St Annes Head and at the mouth of Milford Haven with a confusing sea and swell. To the west of Skokholm there are fast tidal streams up to 4 knots and tidal races (Wildgoose Race), and eddies off Gateholm. The tide flows through constricted areas such as Jack Sound, between Skomer and the Marloes peninsula, and through Ramsey Sound with upto a 6 knot tidal race with gyres.
- 3.11. Higher waves occur where there is shallower water. This occurs on the coast, around the islands and islets including the Smalls and Gateholm and the Bishops and Clerks and where there are shallow sand bars. Waves tend to be higher on

the west facing coasts and lower along Carmarthen Bay and the adjacent sheltered south east facing coast such as at Lydstep and Saundersfoot.



Waves at Broadhaven

MARINE AND COASTAL BIODIVERSITY

- 3.12. There are numerous Special Areas of Conservation (SACs) including Pembrokeshire Marine, Cardigan Bay, Carmarthen Bay and estuaries, Cleddau rivers and the Limestone coast of South West Wales. Special Protection Areas (SPAs) include Ramsey and St David's peninsula coast, Skokholm and Skomer, Grassholm, Castlemartin coast and Carmarthen Bay. There is a Marine Nature Reserve around Skomer which is likely to become a Marine Conservation Zone (MCZ) under the Marine and Coastal Access Act 2009. National Nature Reserves lie on Ramsey, Skomer, Skokholm, Grassholm and Stackpole. Together these designations cover 75% of the coastline and around 60% of the inshore area (see Figure 7).
- 3.13. The maritime habitats include the water column itself and seabed areas of gravel and sand interspersed with submarine cliffs, rocky reefs, stacks and islets.
- 3.14. The water is home to local species of harbour porpoises, bottlenose dolphins, and Atlantic grey seals along with numerous fish species. The seals can be observed resting on isolated beaches or shelving rocks on the more westerly parts of the coast and use the caves and beaches for rearing pups. The harbour porpoises can be seen in places such as Ramsey Sound. Other species visit including sharks, orcas, blue whales and turtles although these are much rarer sightings. All these animals significantly enrich the experience of the seascape and attract many visitors.
- 3.15. The islands and parts of the mainland support a variety of seabirds including gannets on Grassholm, manx shearwater and peregrine falcon, chough, skylarks and stonechat on coastal habitats. The coastal waters provide overwintering areas for grebe, scoter duck and other diving species. These birds often animate the view from the coast path and boats and again attract many visitors.
- 3.16. The sand and gravel seabed is inhabited by surface and burrowing animals such as crabs. The underwater cliffs and reefs accommodate brown kelp, red seaweed, sponges, sea squirts and anemones amongst other species.
- 3.17. The coastal habitats are littoral rocks and beaches with varying degrees exposure and immersion leading to distinctly different communities of plants and animals such as seaweeds, anemones and molluscs.
- 3.18. The estuarine muds support worms and molluscs on which waders and wildfowl feed. Milford Haven and the Daugleddau estuary have high biodiversity and the former hosts eel-grass beds and saltmarsh and a coastal lagoon lies at Gann, Dale. The area is an important feeding ground for wildfowl and waders such as wintering teal, wigeon, curlew and shelduck. Otters are found on the Cleddau.

Migratory fish including sea trout and salmon are found in many watercourses, most famously on the Teifi.



Lagoon at Dale

- 3.19. Exposed coastal habitats of cliff top grasslands and heath support a rich weave of plants including thrift, sea campion, sea plantain, spring squill and red fescue. These bring colour and texture to the rocky cliffs and slopes adding extra pleasure to coastal walks. On more sheltered slopes bracken is apparent, sometimes providing shade to carpets of bluebells, primroses and red campion.
- 3.20. Woodland and scrub reaches the coast in places with associated species, often in incised valleys with watercourses which have wound inland through the plateau to the coast. These add to the diversity of the coastal habitats.

Cultural influences

HISTORICAL

- 3.21. Pembrokeshire's coastline is long and its harbours are good. It juts out into ancient seaways - not only the busy mouth of the Bristol Channel and the sweep of Cardigan Bay but also into a north-south route that encompasses Ireland and western Britain, one that was known to classical antiquity and to the Norseman.
- 3.22. The seascapes of Pembrokeshire have evolved over millennia. The intervisibility of shore, hillslope and sea was clearly significant to the people who erected the Prehistoric monuments in which Pembrokeshire is particularly rich. An example is Mynydd Carningli with its commanding views over Newport Bay. The area also has 54 enigmatic Prehistoric promontory forts, the densest concentration in Wales, though many of these have nearly been lost to wind and water- Flimston Bay, one of the most spectacular, Great Castle Head at Dale and Porth y Rhaw have all been badly eroded. Conversely, sands may have covered important archaeological sites - a Roman port and an early Christian centre, the predecessor of St David's, may lie under the dunes of Whitesands Bay.
- 3.23. The cathedral and the coastal chapels are eloquent reminders that the sea was the great route of the early Christian church in Wales and Ireland - St David's was only 'remote' from the perspective of London or Canterbury. The monastery on Caldey island perpetuates this tradition.
- 3.24. The sea has also had a powerful impact on strategy and historical events. Milford Haven was the landing-place of Henry Tudor, Henry VII, the *mab darogan* who

marched from here to defeat Richard III at Bosworth Field. The landing is obliquely referred to in the court-drama *Cymbeline*, when Imogen, on hearing that her exiled husband may await her at Milford Haven, says:

' . . . how far it is

to this same blessed Milford; and, by the way,

Tell me how Wales was made so happy as

To inherit such a haven ...'

- 3.25. Milford and later Pembroke Dock were the sites of royal navy dockyards from the eighteenth/nineteenth centuries until the late twentieth. There is a particular cluster of defensive sites all around the coast of Pembrokeshire, more marked than in any other area of Wales. From the time of Thomas Cromwell, its overall strategic importance has been recognised - though the French landing at Strumble Head was easily repulsed. Naval ship-building was established at Neyland c. 1760 and at Milford Haven in 1796. It was relocated to Pembroke Dock in 1812, which became one of the most important naval ship-building centres in Britain. Facilities were substantially extended in 1830-32 and again in 1844. Such was the area's importance in strategic terms that forts were built to guard the Haven from possible attack by the aggressive government of Napoleon III. Decline set in after the introduction of the Dreadnoughts and the dockyards finally closed in 1926. Civilian dockyards were also established here. During World War II Pembrokeshire played an important role in the Western Seaboard Defences strategy, when there were twelve airfields in active operation. Remains are still apparent such as the look out on Carn Llidi.



The mouth of Milford Haven

- 3.26. Above all, the coastline has shaped the trade and commerce of the area. Haverfordwest was established at the navigable head of the western Cleddau. Ship yards and creeks were established along the coastline, and the area preserves many fine examples of the small ports that are a feature of the Welsh coast. Lime was quarried from its coastal cliffs, and burnt in sea-shore. Pembrokeshire also had a long-lived coal industry. Some of its collieries such as Trevane, were situated on the coast. Others lay further inland; those around Saundersfoot only developed when a railway was built to connect them with the harbour, in 1829. The ironworks at Stepside also added to coastal trade. Coastal slate quarries were opened along the north coast, of which the largest was Aberiddi, where the pit has been breached by the sea. Slate was exported from Porthgain harbour which later turned to brickmaking using slate waste and then dolerite export. Fishing has been an important regional industry - Milford even boasted a whaling industry at one time. With the introduction of a rail link to wider markets and refrigeration, it expanded to become a major fishing port.

- 3.27. The refineries and oil terminals which began to appear in Milford Haven from 1957 locked the area into a global economy. Other energy-distribution projects have taken their place since, and the sea remains as important to Pembrokeshire as ever.

PRESENT DAY MARINE AND COASTAL ACTIVITIES

- 3.28. Pembrokeshire is established as a popular tourism destination especially around its coast. These tourists are increasingly looking for coastal recreational activities whilst on holiday or coming to the area specifically to participate in such activities. The intensity of use relates to the ease of access with places allowing vehicle access close or on the beach being popular honeypots such as Tenby, Saundersfoot and Amroth to the south east and Newport Bay and Whitesands Bay to the north and west. Other coastal locations are very remote allowing access only by small boat. Activities can vary from general beach activities which are popular at the many good, clean beaches to the more strenuous activities of kite surfing, climbing, diving and coasteering which was invented in the area. The intensity of use is also determined by school holidays as well as the weather.



Caravans at Wiseman's Bridge

- 3.29. Coast walking along the Pembrokeshire Coast Path National Trail (part of the Wales Coast Path) and linked paths is very popular. Over 67,000 visitors used the coast path in 2012. The coast path is 300km long due to the highly indented and complex nature of the coast. Certain stretches are used more intensely than others- mainly those close to the honeypots such as Tenby and Whitesands Bay etc. Another popular recreational activity is kayaking due to the relative ease of access to the water. Other launchable craft that are popular are day motor boats and sailing dinghies out of most beaches with slipways. Sea angling is also popular from both the shore and boats which can go some way offshore.



Coast Path at St Justinians- a popular stretch

- 3.30. Wildlife related recreation trips are popular such as to Skomer Marine Nature Reserve and around Ramsey Island and out to Grassholm for its gannetry. Diving sites are also found in these areas due their biodiversity.

- 3.31. Motor and yacht cruising is found around most of the coast with a higher intensity near marinas and yacht clubs such as the Teifi Estuary to the north and Milford Haven Waterway and Tenby on the south coast.
- 3.32. The fishing industry in Pembrokeshire has moved away from historical deep sea trawling with many fishermen now looking to inshore fishing for crustaceans such as crab and lobster. This results in pots being found around practically any rocky shore.



Potting fishing vessel off Strumble Head

- 3.33. Commercial shipping on the Milford Haven Waterway, primarily of gas [LNG] and oil, along with the ferry terminal at Pembroke Dock, makes this area one of intense activity. This is further intensified with the leisure use.



Milford Haven- refinery

ART AND SEASCAPE

- 3.34. Pembrokeshire's spectacular seascapes have attracted artists in numbers from the 18th century. Peter Watson, of *Horizon* magazine, a patron of young artists, claimed that west Wales represented the closest approach in Britain to the strong light and elemental landscape of the Mediterranean.
- 3.35. Richard Wilson painted Pembroke town and walls c. 1765-6, and Julius Caesar Ibbetson's *The Guide to the Stackpole Scenery pointing to Stack Rock Pembrokeshire* (oil on canvas and water-colour and black ink, 1793) is one of the most explicitly topographical coastal views of the area from this period.
- 3.36. Augustus John is the artist best known for his Pembrokeshire associations, though he spent most of his life away from Wales. The area's seascapes have inspired many contemporary artists, though an increasing focus on abstraction has meant that fewer are works of recognisable places. John Piper, however, who painted *St Bride's Bay*, moved away from non-figurative art from when he first started to visit Wales in 1937, and came to be recognised as a landscape painter in the tradition of Turner. Rosemary ('Ray') Howard-Jones also worked in a more representational style, reflecting her background in archaeological

reconstruction drawing and as a war artist. *Sunset on Skomer* and *Thunderstorm over Skomer* reflect her visits to the island between 1949 and 1951. Graham Sutherland painted St David's Head and the surrounding area many times.

- 3.37. More recent artists include Brendan Burns who was the first Artist in Residence at Oriel y Parc, Landscape Gallery St Davids, 2009-10, a partnership between the National Park & National Museum Wales. His exhibition 'Influere' was held here. His paintings explore the qualities of the sea and coast with works with evocative names such as 'Seabelt shimmer', 'Squally squint', 'Shoreline ramble' and the 'Tidal' series. John Knapp-Fisher has established an art gallery in the area and has painted widely. Subjects include Tenby, Porthgain and Solva, as well as pictures such as 'Beach and Sky' which simply shows the juxtaposition of these two elements separated by the sea.

Aesthetic and Perceptual Influences

- 3.38. The overriding experience of the Pembrokeshire seascape is open and wild sea meeting diverse and sometimes remote indented coasts of rocky cliffs and shores interspersed with sweeping sandy bays and dunes and intimate little coves and harbours.
- 3.39. The scale of the coast varies significantly between the broad sweep of Carmarthen Bay to the narrow, enclosed harbours of Solva, Abercastle and Stackpole Quay. There are intermediate bays such as Newport Bay and Whitesands Bay with their sandy beaches, enclosed by the strong, distinctive headlands of Dinas Head and St David's Head respectively. These rocky landforms frame views out to open sea to the west. To the south, in good visibility, views are possible to Lundy Island.
- 3.40. The diversity of the seascape is apparent at all scales. At a broad scale adjacent areas can differ significantly. The straight open limestone cliff coast of the remote Castlemartin peninsula contrasts with the indented sandstone and igneous coast of the Dale and Marloes peninsulas with their beaches, and again with the natural industrialised harbour of Milford Haven to the north. At a smaller scale the intricate indented coast between Strumble Head and St David's Head changes quickly between rocky cliffs and shores of varying character with small inaccessible coves and a smattering of coastal settlements and harbours such as Abereidly and Porthgain. At a detailed level, the variation of habitats from the littoral rocks, to cliffs and cliff top heathland mosaics contrasting with the hinterland of pasture with Pembrokeshire hedgebanks and steep wooded valleys give a variety of form and texture which delights all on the coast path.



Stackpole Head- panoramic views

- 3.41. The sea also varies in character, through variations in weather including wind direction, fetch, tides and depth of water and nature of the seabed. Strong currents meet around headlands such as St Ann's Head and flow through constricted areas such as Jack Sound, between Skomer and the Marloes

peninsula, and Ramsey Sound. This disturbed water can be dramatic such as the standing wave at The Bitches and is apparent to those on the coast as well as those in boats. Larger waves and 'seahorses' are apparent around the islands and islets such as the Bishops and Clerks and the Smalls as well as on the exposed rocky coasts and west facing beaches such as the dramatic and dangerous Freshwater Bay West with its undertow and the rather safer Whitesands Bay and Newgale Sands, popular with surfers and body boarders. These contrast with the sheltered south and east facing beaches with their relatively calm waters such as at Tenby, Lydstep and Saundersfoot.

- 3.42. A key feature of the Pembrokeshire seascape is the feeling of remoteness, wildness and tranquillity in many parts of the coast. This is particularly apparent on the cliffs on the north coast between Cemmaes Head and Newport Bay, the coast around Strumble Head and St David's Head and the Castlemartin peninsula. These are mostly accessible via the coast path along the cliff tops although the rocky shores are often inaccessible. Castlemartin has restricted access due to MOD use which also disturbs tranquillity while in use. The islands can be more remote and some are inaccessible, such as Skokholm. Only small numbers access Skomer and Ramsey Island and these feel particularly wild with their low intensity management and semi-natural vegetation. Caldey Island has enforced tranquillity with the monastery and controlled visits. Of course the most remote areas are offshore where a few in boats, cruising, fishing or diving can feel like they are getting away from it all.
- 3.43. The busiest parts of the coast include Tenby, Saundersfoot and other coastal settlements to the south east and also honeypots such as Whitesands Bay and Broadhaven. These are the parts of the coast which children experience [and probably like] most. The beach is the focus of activity and visitors, young and old, can experience the sand between their toes, the coolness and movement of the water, the sound of waves crashing on the beach, the smell of the salt air and the wind in their hair. These are different experiences from our normal day to day lives and can give a feeling of refreshment and renewal. Evocative holiday experiences can stay with people for the rest of their lives and draw them back to the coast and the sea again and again to 'refresh their batteries'.
- 3.44. The Pembrokeshire coast and islands have a strong sense of place contributed to by both the natural splendour of the indented rocky coastline and islands and the mark of man such as peninsula forts eg Castell Coch, religious sites eg St Govan's Chapel and deserted workings eg Porthgain or Abereddy.



St Govan's Chapel

4. Cultural benefits and services

- 4.1. Cultural benefits and services cover the non-material benefits that people obtain from ecosystems such as spiritual and religious enrichment, cultural heritage, recreation and tourism and aesthetic experience. The UK National Ecosystem Assessment, 2011, defines 'Ecosystem cultural services' as '*the environmental settings that give rise to the cultural goods and benefits that people obtain from ecosystems*'. These involve '*a range of complex cultural practices, such as the development of institutions, the application of capital, and human processes involving memories, motions, the senses, and aesthetic appreciation.*' The background to this is discussed further in **Appendix C**.
- 4.2. The Pembrokeshire seascape clearly offers these services in a number of ways. These are set out in **Table 1** as a framework for the brief descriptions for each seascape character area (SCA).

Table 1 Ecosystem cultural services provided by the Pembrokeshire seascape

<i>Generic service category</i>	<i>Typical components in Pembrokeshire seascape</i>
Leisure / recreation	<ul style="list-style-type: none"> • walking the Coast Path, rambling, hill walking • sailing, canoeing, rowing, windsurfing, surfing, kite surfing • swimming, diving, snorkelling, rock-pooling, beach activities • angling, shore-based and from boats • wildlife boat trips • climbing, coasteering • horse riding/beach riding • land yachting • power boating, waterskiing, jet-skiing • parks and play areas
Spiritual / religious	<ul style="list-style-type: none"> • connection with sense of remoteness, tranquillity and timelessness/time depth • connectedness with nature • places of worship, monastery and retreat centres • places with particular sense of identity for local communities
Artistic / cultural heritage	<ul style="list-style-type: none"> • archaeological features such as promontory forts • historic sites and buildings • environmental education activity • festivals and events • food and farming traditions • craft traditions • museums, galleries, and visitor facilities to interpret the environment and cultural heritage
Natural heritage	<ul style="list-style-type: none"> • interactions with or observation of wildlife (for example bird watching, seal watching, dolphin and whale watching) • interaction with the natural coastal and marine environment as a leisure activity • diversity of views, sense of spaciousness, and appreciation of aesthetic qualities

5. Forces for change

- 5.1. Forces for change have been considered in respect of how they affect the special qualities of the National Park. They can be divided into natural processes and climate change, marine/water based activity, coastal development and marine related activity and land management.
- 5.2. Natural processes include erosion of coasts, sedimentation and flooding. Though climate change is likely to have significant effects in the long term in relation to sea level rise and changing weather patterns the study focuses mainly on the existing evident and or likely effects over the next ten years. Sea defences can radically change the character of the coast from natural to one dominated by manmade structures.
- 5.3. The port of Milford is the third largest in the country and used by large tankers and other craft including ferries. The area is very popular for tourism and water based activity is increasing with sailing and motor leisure boating driven by new marinas being developed in Fishguard and Pembroke Dock, with other marinas and moorings also increasing capacity. There is also an increase in wildlife and boat trips, canoes and other craft. The emergence of potentially higher protection around proposed marine conservation areas such as Skomer may have implications as to recreational use and access. One of the major tensions in the National Park is the need to protect wildlife which flourish in the remote coastal waters, islands, cliffs and beaches whilst managing a variety of visitors who increasingly wish to enjoy and access these fragile areas potentially causing damage and disturbance. Offshore there are licensed areas for wind energy [Atlantic Array], for dredging, oil and gas and use by the MOD for firing ranges and military training. Ramsey Sound is being explored for tidal energy. These activities can have physical effects such as pollution or disturbance of sensitive areas but can also disturb tranquillity and a sense of remoteness.
- 5.4. The coast-based infrastructure related to marine commercial activity such as the refineries, storage facilities and power station along Milford Haven will continue to respond to more Liquid Natural Gas [LNG] and other changing requirements for energy. The area's chimneys and structures are already widely visible in the National Park. Onshore infrastructure for renewable energy may affect coastal character eg Ramsey Sound. The Coast Path, once a stand-alone attraction, has now been joined by an all Wales Coast Path which itself is gaining much promotion. This will potentially increase usage with attendant damage to the path structure through compaction and erosion. Coaststeering and climbing plus beach based activities are putting pressure on the coastal resource with associated infrastructure, erosion, compaction and litter. Pressure is also increasing on the access points to the water for recreation.
- 5.5. Whilst the study concentrates on marine-related issues, the view along the coast, and its character, are partly defined by the management of landcover such as farmland. Changes to field boundaries with the removal of hedgebanks/replacement with fences and changes to intensity of management either with abandonment of fields or rough grazing or intensification from unimproved pasture to arable can have significant effects. The attractiveness of the area also leads to pressure for housing and tourist development and associated commercial enterprises. Onshore wind energy can also affect coastal character and may cause cumulative effects with port and oil/gas infrastructure.
- 5.6. The relevant forces for change are set out with further background explanation in the table in **Appendix D**.

6. Sensitivity of seascape

6.1. The sensitivity of the Pembrokeshire seascape to change was explored for each SCA and was found to be generally high. The key sensitive characteristics and features include:

- Intricate, complex, rugged, indented natural coast with dramatic headlands and islands eg St David's Head, Skomer, Ramsey Island, Strumble Head, Stackpole Head.
- Important focal points along the coast and out to sea including islands, islets, headlands and distinctive sweeping beaches such as Whitesands Bay, Freshwater West and Newport Bay.
- Unspoilt hills and backdrops which contribute to seascape character eg Carn Llidi and Mynydd Carningli.
- Views from key places such as headlands, coastal hills and the Coast Path.
- Open views to an unspoilt sea horizon reinforcing a sense of escape and space to breathe.
- Open sea and offshore islands and islets with limited, if any, signs of man.
- Small scale, enclosed, views to horizon framed by landform in the many coves and beaches such as Barafundle Bay, Broadhaven, Abereiddi and Newport Bay and also at St Govan's Chapel. Any development out to sea within this enclosed view could be particularly disruptive.
- Tranquil seascapes where there is little disturbance and signs of development and dark skies.
- Remote undeveloped seascapes with wild, highly natural, elemental character such as the islands, north coast south west of Strumble Head and Castlemartin peninsula.
- Secluded and tranquil, well treed character of the Daugleddau estuary with its historic quays.
- Small scale, traditional historic coastal settlements such as Solva, Abercastle, Porthgain and Newport, and harbours such as Porthclais and Stackpole Quay.
- Other coastal conservation areas with dramatic settlement features such as the skyline and harbour of Georgian Tenby.
- Presence of coastal and island historic features such as peninsula forts, castles, chapels eg St Govan, monasteries ie Caldey Island, other buildings and structures and other heritage features which have a strong relationship with the coast and sea visually, physically and culturally.
- Presence of marine, intertidal and coastal edge habitats with high biodiversity particularly the Skomer Marine Nature Reserve, National Nature Reserves such as Ramsey Island, SACs covering the majority of the coast and out to sea around the Smalls, Carmarthen Bay SPA and coastal SSSIs.
- The connections of the area with St David and Giraldu Cambrensis and other historical figures.

- 6.2. These sensitivities are set out in more detail for each SCA informed by the factors influencing sensitivity summarised in **Appendix E**. This also sets out those factors which tend to detract from sensitivity in some areas.

7. List of Summary Figures (see separate document)

FIGURES

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8. List of Seascape Character Areas

(see separate document)

The 44 seascape character areas are described in detail in separate documents. The description is divided into physical, cultural and aesthetic and perceptual influences with ecosystem cultural services, key forces for change and sensitivities defined. The seascape character areas are listed as follows:

SCA1	Teifi Estuary
SCA2	Cardigan Island and Cemmaes Head
SCA3	Pen y Afwr to Pen y Bal
SCA4	Newport Bay
SCA5	Dinas Island
SCA6	Fishguard Bay west
SCA7	Fishguard and Goodwick Harbours
SCA8	North open sea
SCA9	Newport and Fishguard outer sand bar
SCA10	Crincoed Point and Strumble Head
SCA11	Strumble Head to Penbwchdy
SCA12	Strumble Head deep water
SCA13	Penbwchdy to Penllechwen
SCA14	Western sand and gravel bars
SCA15	St Davids Head
SCA16	Whitesands Bay
SCA17	Ramsey Sound
SCA18	Ramsey Island coastal waters
SCA19	Bishops and Clerks
SCA20	St Brides Bay coastal waters north
SCA21	St Brides Bay coastal waters east
SCA22	St Brides Bay coastal waters south- Borough Head
SCA23	St Brides Bay south coastal waters - The Nab Head
SCA24	St Brides Bay
SCA25	Skomer Island and Marloes Peninsula
SCA26	Skokholm and Gateholm coastal waters
SCA27	Grassholm and the Smalls
SCA28	West open sea
SCA29	Southern inshore waters
SCA30	Southern offshore waters
SCA31	Outer Milford Haven
SCA32	Inner Milford Haven
SCA33	Daugleddau
SCA34	Freshwater West
SCA35	Castlemartin coastal waters
SCA36	Stackpole coastal waters
SCA37	Freshwater East and Manorbier
SCA38	Lydstep Haven coastal waters
SCA39	Tenby and Caldey Island
SCA40	Carmarthen Bay west
SCA41	Carmarthen Bay north- Pembrey

SCA42 Carmarthen Bay
SCA43 Bristol Channel offshore
SCA44 Western offshore- very deep water