

## **APPENDICES**

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# 1. Appendix A Data and Sources

## Pembrokeshire Seascape Character Assessment

### DATA SOURCES FOR BASELINE

#### INFORMATION

Key datasets	Data Layers	Source	Projection	Source	Path
	Hydrospatial Chartered Rasters	Seazone	WGS84	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\Chartered Raster
	Hydrospatial Chartered Vector Features	Seazone	WGS84	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial\
	OS map - 1:250,000	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS250K
	OS map - 1:50,000	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS50K
	OS map - 1:25,000	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS25K
	Mean High Water	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS_mastermap\wales_osmm_mhw
		Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS_boundaryline\hwm
	Mean Low Water	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS_mastermap\wales_osmm_mlw
		Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS_boundaryline\mlw

	12 Nautical Mile Territorial Sea limit	Seazone	WGS84	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial\Welsh_12nm
		UKHO	BNG	CCW	M:\GIS_Data\Live\Hydrographic\UKHO\UKHO_territorial_limits\lines\nm1_12_lines
		UKHO	BNG	CCW	M:\GIS_Data\Live\Hydrographic\UKHO\UKHO_territorial_limits\polygons\nm1_12_polys
		UKHO	BNG	CCW	M:\GIS_Data\Live\Hydrographic\UKHO\UKHO_territorial_limits\polygons\nm12_poly
	UK Continental Shelf Limit	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
<b>Key datasets</b>	<b>Data Layers</b>	<b>Source</b>	<b>Projection</b>	<b>Source</b>	<b>Path</b>
	Renewable Energy Zone	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Unitary Authority Boundaries	Ordnance Survey	BNG	CCW	M:\GIS_Data\Live\Ordnance_Survey\OS_boundaryline\Unitary_Authority
	Harbour Limits	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Shoreline Management Plan	Councils		Contractor	Web for detailed information. PCNPA for GIS polygons
	Coast Pilot	Yatching Monthly		Contractor	Reeds Almanac and local coast/sea user book obtained
	Ports	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	<b>Character Assessment</b>				
	Landscape	CCW	BNG	CCW	M:\GIS_Data\Live\Physical\Landscape_character\Landscape_Character_Areas_July09

	Character Map for Wales				
	Regional Seascape Units	CCW	BNG	CCW	M:\GIS_Data\Live\Physical\Seascapes\Seascapes Units (FINAL June 2008)
	LANDMAP aspects	CCW	BNG	Download	Download from CCW Web site
	Landscape character assessment	PCNPA	BNG	PCNPA	PCNPA email
	AONB	CCW	BNG	CCW	Download from CCW web site
	<b>Natural Features</b>				
	OS Landform Panorama	Ordnance Survey		Contractor	OS Open Data Contractor to Source
<b>Key datasets</b>	<b>Data Layers</b>	<b>Source</b>	<b>Projection</b>	<b>Source</b>	<b>Path</b>
	Seazone Bathymetry and Elevation	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
		Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Wave Climate	CCW	WGS83	CCW	M:\GIS_Data\Live\Biological\Habitats\Marine\HABMAP
	LANDMAP Geological Landscapes	CCW	BGN	Download	Download from CCW web site
	LANDMAP Landscape Habitats	CCW	BGN	Download	Download from CCW web site

	DigMapGB-250	CCW		Contractor	sourced separately- essential dataset
	DigBath (Digrock250 & DigSB250)250	CCW		Contractor	sourced separately- essential dataset
	Hydrospatial Climate and Oceanography	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Intertidal Phase 1 Habitat Survey	CCW	BNG	CCW	M:\GIS_Data\Live\Biological\Habitats\Marine\phase1_intertidal
	Terrestrial Phase1 Habitat Survey	CCW	BNG	CCW	M:\GIS_Data\Live\Biological\Habitats\Terrestrial\phase_1
	UK SeaMap 2006 & 2010	JNCC		Contractor	Contractor to Source
	Tidal Flow	Renewable Energy Atlas		Contractor	Contractor to Source
	OS Base Maps	OS	BNG	CCW	See Above
<b>Key datasets</b>	<b>Data Layers</b>	<b>Source</b>	<b>Projection</b>	<b>Source</b>	<b>Path</b>
	<b>Cultural/Social Factors</b>				
	Wrecks	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW\CADW_Designated_Wrecks
	Marine Archaeological Sites	RCAHMW		Contractor	Contractor sourced on web

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	Wrecks & Obstructions	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial\Wrecks & Obstructions
	Anchorage, Anchor Berths & bad weather Refuge	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Buoys	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Ferry Terminals	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Fog Signals	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Traffic separation Zones	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Coastguard Stations	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Coastal Path/Long Distance Walking Routes	CCW	BNG	CCW	M:\GIS_Data\Live\Access\Rights_of_way\Wales_coastal_path
	Sailing Areas	RYA		Contractor	National dataset not sourced due to cost- hard copy used instead
	Cruising routes	RYA		Contractor	National dataset not sourced due to cost- hard copy used instead
	Sailing Facilities	RYA		Contractor	National dataset not sourced due to cost- hard copy used instead
	Small Craft mooring sites	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
<b>Key</b>	<b>Data Layers</b>	<b>Source</b>	<b>Projection</b>	<b>Source</b>	<b>Path</b>

<b>datasets</b>					
	Tourism Sites	Pembrokeshire Coastal Forum		Contractor	sourced
	Water Skiing Areas	Pembrokeshire Coastal Forum		Contractor	sourced
	Wind & Kite Surfing Areas	Pembrokeshire Coastal Forum		Contractor	sourced
	Yatch Harbour & Marine Areas	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	MOD Areas	MOD	BNG	CCW	M:\GIS_Data\Live\Land_Management\external_agency\ministry_of_defence
	Activity Licenses [MOD, wind, dredging, oil, gas]	Seazone	Lat/long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Infrastructure	Seazone	Lat/Long	CCW	M:\GIS_Data\Live\Hydrographic\seazone_hydrospatial\data\hydrospatial
	Tidal Energy resource	UK Renewable Atlas		Contractor	Contractor to Source- not used
	Wave power Resource	UK Renewable Atlas		Contractor	Contractor to Source- not used
	Fisheries Atlas	Clare Eno, CCW			
	AONB	CCW	BNG	Download	Download from CCW web site
	Landmap Historic Landscape Aspects	CCW	BNG	Download	Download from CCW web site

	Cultural landscape Aspects Landmap	CCW	BNG	Download	Download from CCW web site
	Visual and Sensory Aspect Landmap	CCW	BNG	Download	Download from CCW web site
	Conservation Areas			Contractor	Local authority
<b>Key datasets</b>	<b>Data Layers</b>	<b>Source</b>	<b>Projection</b>	<b>Source</b>	<b>Path</b>
	Historic Parks & Gardens	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW\Parks_&_gardens
	Listed Buildings	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW>Listed_Buildings
	Protected Wreck Sites	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW\CADW_Designated_Wrecks
	Scheduled Momuments	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW\Scheduled_Ancient_Monuments
	Historic landscape Areas	CADW	BNG	CCW	M:\GIS_Data\Live\Physical\historic_landscapes\CADW\historic_landscapes
	Special Areas of Conservation SACs	CCW	BNG	Download	Download from CCW web site
	National Nature Reserves NNRs	CCW	BNG	Download	Download from CCW web site
	Ramsar Sites	CCW	BNG	Download	Download from CCW web site
	Special Protected Areas SPAs	CCW	BNG	Download	Download from CCW web site
	RSPB Reserves	RSPB	BNG	CCW	M:\GIS_Data\Live\Land_Management\external_agency\rspb_reserves
	Important Bird Areas	RSPB	BNG	CCW	M:\GIS_Data\Live\Biological\Species\all_wales\Terrestrial\RSPB



	Important Bird Areas				Also download from the NBN Gateway
	Dark Skies			Contractor	LUC
	Wave Climate	CCW	WGS83	CCW	LUC
	Land with Sea Views	CCW	BNG	CCW	M:\GIS_Data\Live\Physical\Seascapes\Land with sea views
	Sea Surface Visibility	CCW	BNG	CCW	M:\GIS_Data\Live\Physical\Seascapes\Seascapes relative visibility of the sea 0-24km from coastline
	Tranquil Areas	CCW	BNG	CCW	M:\GIS_Data\Live\Physical\Tranquil_Areas

#### Key

Yellow = CCW supplied

Orange = download from CCW website

Orange- CCW supplied separately

Blue = contractor sourced if necessary

light green= received from client [PCNPA]and third parties- LUC, CPRE

Red- cost prohibitive, pdf mapping obtained. Helpful if NRW obtained GIS dataset

Dark green- information obtained at a cost

## 2. Appendix B Seascape Typology and Types

### Pembrokeshire seascape character assessment

MARINE SEASCAPE CHARACTER TYPES										
Names, numbers and nomenclature				Main drivers defining type boundaries			Additional descriptors			
<i>SCT no.</i>	<i>Location</i>	<i>Nomenclature</i>	<i>SCT Name</i>	<i>Bathymetry</i>	<i>Seabed</i>	<i>Wave stress</i>	<i>Topography</i>	<i>Turbulence</i>	<i>Sea feature</i>	<i>Bedrock</i>
1	St Brides Bay	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves (4-7)	low slope (<1°)	tidal/subtidal	20m contour	Carboniferous sandstones and mudstones
2	St Davids/Porth Clais cliffs	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	E-W sand to gravelly sand	High/strong waves (4-7)	low slope (<1°)	tidal/subtidal	20m contour	Precambrian--Cambrian sandstones and mudstones
3	St Brides Bay (outer)	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand out (W) to muddy sand	Low waves [1-3]	low slope (<1°)		20m contour	mostly Carboniferous sandstones and mudstones
4	Stack Rock - Talbenny cliffs	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sand/bedrock islet	High/strong waves (4-7)	low slope (<1°); islet	tidal/subtidal	low ridge	dacite intrusion
5	St Brides-Marloes	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves (4-7)	low slope (<1°)	tidal/subtidal		Old Red Sandstone Raglan Mudstone and St Maughan's Formation mudstones and sandstones
6	Skomer - Marloes	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	gravelly sand/bedrock islets	High/strong waves (4-7) on W and S sides	steep slope (<10°) to low slope (>1°); islets	tidal/subtidal	ridge	Skomer Volcanic Group

7	Skokholm	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	gravelly sand/bedrock islet	High/strong waves (4-7)	moderate slope (1-10°); islets		islet	Old Red Sandstone
8	Marloes offshore incl Gateholm	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves (4-7)	low slope (<1°)	tidal/subtidal		Old Red Sandstone
9	offshore Skomer-Milford	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	gravelly sand	Low waves [1-3]	low slope (<1°)	slack	30-50m	
10	deeper S of Ramsay - Milford Haven	PeSCTmmgl	Medium depth water/gravel sea bed/low wave stress	Medium depth water 30-60m	sandy gravel and gravel	Low waves [1-3]	low slope (<1°)		50-60m	Skomer Volcanic Group- Devonian/Carboniferous
11	Grassholm	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel and bedrock islet	High/strong waves (4-7)	low slope (<1°) to moderate slope (1-10°)		islet	Skomer Volcanic Group
12	outer Grassholm - the Smalls	PeSCTmmgh	Medium depth water/gravel sea bed/high wave stress	Medium depth water 30-60m	sandy gravel	High/strong waves (4-7)	low slope (<1°) to moderate slope (1-10°)	rougher to W of islands		Skomer Volcanic Group
13	Ramsey Sound	PeSCTmsgl	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sandy gravel	High/strong waves [4-7]	steep slope (>10°)	tidal	strait	Precambrian-Cambrian sandstones, mudstones, tuffs
14	Ramsey Sound	PeSCTmmgh	Medium depth water/gravel sea bed/high wave stress	Medium depth water 30-60m to deep <60m)	sandy gravel	High/strong waves [4-7]	deep channel	tidal	strait	Precambrian-Cambrian sandstones, mudstones, tuffs
15	Ramsey Sound	PeSCTmsgl	Shallow water/gravel sea bed/low wave stress	Shallow water 0-30m	sandy gravel	Low waves [1-3]	moderate slope (1-10°)	tidal	strait	Precambrian-Cambrian sandstones, mudstones, tuffs
16	Ramsey	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel/rock	High/strong waves [4-7]	moderate slope (1-10°)	tidal	island	gabbros and acid intrusions, Cambrian-Ordovician sandstones

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										and shales
17	Islets W of Ramsey	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel/rock	High/strong waves [4-7]	islets/moderate slope (1-10°)		islets/ridge	gabbros
18	St Georges channel	PeSCTmmgh	Medium depth water/gravel sea bed/high wave stress	Medium depth water 30-60m	sandy gravel	High/strong waves [4-7]	low slope (<1°)		channel	Cambrian-Ordovician sandstones and shales
19	Islets W of Ramsey	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel/rock	High/strong waves [4-7]	islets/moderate slope (1-10°)		islets/ridge	gabbros
20	Islets W of Ramsey	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel/rock	High/strong waves [4-7]	islets/moderate slope (1-10°)		islets/ridge	bedrock' ?gabbros
21	Shallows S of Ramsey	PeSCTmsggh	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sand -sandy gravel	High/strong waves [4-7]	shallow area			? Intrusion
<b>Names, numbers and nomenclature</b>				<b>Main drivers defining type boundaries</b>			<b>Additional descriptors</b>			
<b>SCT no.</b>	<b>Location</b>	<b>Nomenclature</b>	<b>SCT Name</b>	<b>Bathymetry</b>	<b>Seabed</b>	<b>Wave stress</b>	<b>Topography</b>	<b>Turbulence</b>	<b>Sea feature</b>	<b>Bedrock</b>
22	Offshore Strumble - S of Ramsey	PeSCTmmgl	Medium depth water/gravel sea bed/low wave stress	Medium depth water 30-60m	sandy gravel-gravel	Low waves [1-3]	low slope (<1°)			Lower Palaeozoic-Devonian/Carboniferous
23	~50-70m: Offshore sand bar W of St Brides Bay	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	gravelly sand to sand	Low waves [1-3]	low slope (<1°)	slack	sand bar	Lower Palaeozoic-Devonian/Carboniferous - Permian-Jurassic - Palaeogene-Neogene. Large NE-SW fault
24	Whitesand Bay	PeSCTmsggh	Shallow water/gravel sea	Shallow water 0-30m	sandy gravel	High/strong waves [4-7]	low slope (<1°)	tidal/subtidal	bay	Precambrian-Cambrian sandstones, mudstones,

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			bed/high wave stress							tuffs
25	Continuation N of Ramsey channel	PeSCTmmgh	Medium depth water/gravel sea bed/high wave stress	Medium depth water 30-60m	sandy gravel	High/strong waves [4-7]	moderate slope (1-10°) - steep slope (>10°)	moderate depth trough		
26	Carn Llidi coastline	PeSCTmsgH	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sandy gravel	High/strong waves [4-7]	moderate slope (1-10°)	tidal/subtidal	bordering high cliffs	Ordovician gabbros, shales
27	offshore sand bar N of Ramsey islets	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand - gravelly sand	High/strong waves [4-7]	moderate slope (1-10°)		sand bar	Lower Palaeozoic
28	offshore sand bar N of Ramsey islets	PeSCTmmsh	Medium depth water/sand sea bed/high wave stress	Medium depth water 30-60m	gravelly sand	High/strong waves [4-7]	moderate slope (1-10°)		sand bar	Lower Palaeozoic
29	St David's - Strumble	PeSCTmsgH	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sandy gravel	High/strong waves [4-7]	moderate slope (1-10°) headlands, low slope (<1°) bays		cliff headlands, bays	Cambrian-Ordovician sandstones and shales
30	Strumble headland	PeSCTmsch	Shallow water/conglomerate sea bed/high wave stress	Shallow water 0-30m	conglomerate	High/strong waves [4-7]	moderate slope (1-10°) - steep slope (>10°)		bordering cliffs	Ordovician gabbros, shales
31	off Strumble-Fishguard	PeSCTmmch	Medium depth water/conglomerate sea bed/high wave stress	Medium depth water 30-60m	conglomerate mostly (minor sandy gravel)	High/strong waves [4-7]	low slope (<1°) to moderate slope (1-10°)			Ordovician gabbros, shales
32	off Strumble	PeSCTmdcl	Deep water/conglomerate sea bed/low wave	Deep water 60-100m	conglomerate	Low waves [1-3]	low slope (<1°)			Ordovician gabbros, shales

			stress							
33	sand slack n of Strumble	PeSCTmdsl	Deep water/sand sea bed/low wave stress	Deep water 60-100m	gravelly sand	Low waves [1-3]	low slope (<1°)	slack	very sheltered (1)	Lower Palaeozoic mudstones/sandstones, Permian mudstones/sandstones, Jurassic sandstones/limestones; large faults NE-SW
34	Fishguard - Dinas Head	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	muddy sand	Low waves [1-3]	low slope (<1°)			Ordovician volcanics, Ordovician mudstones and sandstones
35	Dinas Head	PeSCTmsch	Shallow water/conglomerate sea bed/high wave stress	Shallow water 0-30m	conglomerate	High/strong waves [4-7]	moderate slope (1-10°)			Ordovician mudstones and sandstones
36	Dinas Head to Morfa	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	muddy sand	High/strong waves [4-7]	low slope (<1°)		more exposed E side	Lower Palaeozoic (Ordovician) mudstones/sandstones
37	Strumble Bank - off Strumble-Fishguard	PeSCTmsgl	Shallow water/gravel sea bed/low wave stress	Shallow water 0-30m	sandy gravel	Low waves [1-3]	low slope (<1°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
38	off Fishguard - E Newport Bay	PeSCTmsgh	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sandy gravel to gravel	High/strong waves [4-7]	low slope (<1°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
39	Northern offshore	PeSCTmmgl	Medium depth water/gravel sea bed/low wave stress	Medium depth water 30-60m	sandy gravel	Low waves [1-3]	low slope (<1°)			Jurassic - Cenozoic; ENE-WSW faults
40	offshore sandbank N of Dinas Head	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand	Low waves [1-3]	low slope (<1°)	slack	E-W sand bar	Lower Palaeozoic (Ordovician) mudstones/sandstones

41	Foel Fach to Pengam	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	sand	Low waves [1-3]	low slope (<1°)		outer sand bar	Lower Palaeozoic (Ordovician) mudstones/sandstones
<b>Names, numbers and nomenclature</b>				<b>Main drivers defining type boundaries</b>			<b>Additional descriptors</b>			
<b>SCT no.</b>	<b>Location</b>	<b>Nomenclature</b>	<b>SCT Name</b>	<b>Bathymetry</b>	<b>Seabed</b>	<b>Wave stress</b>	<b>Topography</b>	<b>Turbulence</b>	<b>Sea feature</b>	<b>Bedrock</b>
42	E of Cardigan island	PeSCTmsmh	Shallow water/mud sea bed/high wave stress	Shallow water 0-30m	sandy mud and gravelly sand	High/strong waves [4-7]	low slope (<1°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
43	Pengam	PeSCTmsch	Shallow water/conglomerate sea bed/high wave stress	Shallow water 0-30m	conglomerate	High/strong waves [4-7]	moderate slope (1-10°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
44	Moylgrove	PeSCTmsggh	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	sandy gravel and gravelly sand	High/strong waves [4-7]	moderate slope (1-10°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
45	Cardigan island	PeSCTmsch	Shallow water/conglomerate sea bed/high wave stress	Shallow water 0-30m	conglomerate/island bedrock	High/strong waves [4-7]	moderate slope (1-10°)			Lower Palaeozoic (Ordovician) mudstones/sandstones
46	Teifi estuary	PeSCTmTe	Tidal channels/estuary	Tidal channels	estuary, muddy sand		low slope (<1°)	tidal		
47	sand bar W of Cemaes Head	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves [4-7]	moderate slope (1-10°)			
49	Offshore N of Strumble - Skomer Volcanic Group islands	PeSCTmdgl	Deep water/gravel sea bed/low wave stress	Deep water 60-100m	sandy gravel and gravel	Low waves [1-3]	low slope (<1°)			

50	offshore sand slack NW of Ramsey area	PeSCTmdsl	Deep water/sand sea bed/low wave stress	Deep water 60-100m	gravelly sand and sand	Low waves [1-3]	low slope (<1°)			
51	offshore sand slack NW of Ramsey area	PeSCTmvsI	Very deep water/sand sea bed/low wave stress	Very deep water >100m	gravelly sand and sand	Low waves [1-3]	low slope (<1°)			
52	offshore NW of Ramsey area	PeSCTmdcl	Deep water/conglomerate sea bed/low wave stress	Deep water 60-100m	conglomerate	Low waves [1-3]	low slope (<1°)			
53	outer St Brides Bay	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	gravelly sand and slightly gravelly sand	Low waves [1-3]	low slope (<1°)			Devonian-Carboniferous mudstones/sandstones
54	offshore S of Grassholm and islets	PeSCTmdgl	Deep water/gravel sea bed/low wave stress	Deep water 60-100m	sandy gravel and gravel	Low waves [1-3]	low slope (<1°)			
55	western deep offshore	PeSCTmvsI	Very deep water/sand sea bed/low wave stress	Very deep water >100m	sand	Low waves [1-3]	low slope (<1°)	slack		Permian -Jurassic mudstones, sandstones, limestones
56	Milford Haven mouth	PeSCTmTr	Tidal channels/ria	tidal channel	estuary/ria	low waves (1-3)	moderate slope (1-10°) at entrance, low slope (<1°) in estuary	tidal	channel <25m	Old Red Sandstone, some Carboniferous Limestone
57	Milford Haven	PeSCTmTr	Tidal channels/ria	tidal channel	estuary/ria	low waves (1-3)	moderate slope (1-10°) in channel, low slope (<1°) on muddy banks	tidal/slack	channel <25m	Old Red Sandstone, Carboniferous Limestone; Ritec Fault
58	Sheep island - Linney Head	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves [4-7]	low slope (<1°) to moderate slope (1-10°)	tidal/subtidal	bay	Old Red Sandstone, dune fields



59	Carreg Bwch Ddu-Strumble	PeSCTmsch	Shallow water/conglomerate sea bed/high wave stress	Shallow water 0-30m	conglomerate	High/strong waves [4-7]	low slope (<1°) to steep slope (<10°)	tidal/subtidal		Ordovician gabbros, shales
60	offshore W of Strumble	PeSCTmmch	Medium depth water/conglomerate sea bed/high wave stress	Medium depth water 30-60m	conglomerate	High/strong waves [4-7]	low slope (<1°) to moderate slope (1-10°)			Ordovician gabbros, shales
62	sand bar S of Ramsey	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	sand and gravelly sand bar	Low waves [1-3]	low slope (<1°)		sand bar	? Devonian-Carboniferous
63	offshore W of Freshwater W	PeSCTmmrl	Shallow water/rock sea bed/low wave stress	Medium depth water 30-60m	rock	Low waves [1-3]	low slope (<1°)	slack	rock sea floor	? Devonian-Carboniferous
Names, numbers and nomenclature				Main drivers defining type boundaries			Additional descriptors			
<b>SCT no.</b>	<b>Location</b>	<b>Nomenclature</b>	<b>SCT Name</b>	<b>Bathymetry</b>	<b>Seabed</b>	<b>Wave stress</b>	<b>Topography</b>	<b>Turbulence</b>	<b>Sea feature</b>	<b>Bedrock</b>
64	offshore Linney Head	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	sand and gravelly sand	Low waves [1-3]	low slope (<1°)	slack		
65	Linney Head - Trevellen	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	gravelly sand	High/strong waves [4-7]	low slope (<1°) to moderate slope (1-10°)			Carboniferous Limestone rocky coast and Brownslade Burrows
66	S of Trevellen	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	gravelly sand	Low waves [1-3]	low slope (<1°)	less slack	sand bar	Triassic sandstones, halite, E-W faults
67	Trevelen - Stackpole	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	gravelly sand	High/strong waves [4-7]	low slope (<1°) to moderate slope (1-10°)	slack by coast		Carboniferous Limestone rocky coast and Stackpole Warren

68	Stackpole - Lydstep	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand	Low waves [1-3]	low slope (<1°)			Old Red Sandstone, some Ordovician shales and Silurian grey sandstones
69	Lydstep - Gosker Rock	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand	Low waves [1-3]	low slope (<1°) to moderate slope (1-10°)	slack along N-S coast		Carboniferous Limestone rocky coast and Caldey Island and The Burrows
70	Gosker Rock - Pendine	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand	Low waves [1-3]	low slope (<1°)			Millstone Grit, Coal Measures, Carboniferous Limestone in E
71	Pendine Sands	PeSCTmssh	Shallow water/sand sea bed/high wave stress	Shallow water 0-30m	sand	High/strong waves [4-7]	low slope (<1°)			Old Red Sandstone
72	offshore S, 30m ridges	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	sand	Low waves [1-3]	low slope (<1°)	slack	ridges of sand perpendicular to currents	Triassic sandstones, halite, E-W faults
73	S Of Pendine	PeSCTmsgH	Shallow water/gravel sea bed/high wave stress	Shallow water 0-30m	gravel	High/strong waves [4-7]	low slope (<1°)		gravel bar	Devonian-Carboniferous mudstones/sandstones
74	Offshore S	PeSCTmmsl	Medium depth water/sand sea bed/low wave stress	Medium depth water 30-60m	sand	Low waves [1-3]	low slope (<1°)		drainage channels/sand waves perp. To channel	Triassic sandstones, halite, E-W faults
75	ofshore S of Trevellen	PeSCTmmgl	Medium depth water/gravel sea bed/low wave stress	Medium depth water 30-60m	gravel	Low waves [1-3]	low slope (<1°)	less slack	gravel edge to shallower sand bar	Devonian-Carboniferous mudstones/sandstones
76	offshore SW	PeSCTmdsl	Deep water/sand sea bed/low wave stress	Deep water 60-100m	sand	Low waves [1-3]	low slope (<1°)	slack	drainage channels/sand waves perp. To channel	Triassic sandstones, halite, E-W faults; Cretaceous chalk

77	The Smalls and other islets	PeSCTmsrh	Shallow water/rock sea bed/high wave stress	Shallow water 0-30m	sandy gravel and bedrock islet	High/strong waves (4-7)	low slope (<1°) to moderate slope (1-10°)		islet	Skomer Volcanic Group
79	Carmarthen Bay	PeSCTmssl	Shallow water/sand sea bed/low wave stress	Shallow water 0-30m	sand	Low waves [1-3]	low slope (<1°)	less sheltered to E		Triassic sandstones, halite, E-W faults
81	W offshore	PeSCTmvgl	Very deep water/gravel sea bed/low wave stress	Very deep water >100m	gravel	Low waves [1-3]	low slope (<1°)	slack		Palaeogene-Neogene mudstones.sandstones, lignite

Pembrokeshire seascape character assessment

INTERTIDAL AND TERRESTRIAL SEASCAPE CHARACTER TYPES

Intertidal		
Nomenclature	Type	Source and comments
		<i>Based on CCW Phase 1 intertidal EUNIS L3 description</i>
PeSCTiR	Rock	derived from high energy, moderate energy and low energy littoral rock, infralittoral rock and supralittoral rock, features of littoral rock
PeSCTiS	Sand and shingle	derived from littoral sand, sub littoral sand, littoral coarse sediment and littoral mixed sediment
PeSCTiM	Mud	derived from littoral mud and littoral muddy sand
PeSCTiSM	Saltmarsh and saline reedbed	derived from coastal saltmarsh and saline reedbed
PeSCTiB	Biogenic reefs	derived from littoral biogenic reefs
Terrestrial		
Nomenclature	Type	Source and comments
		<i>Based on CCW LANDMAP landscape habitats aspect Level 2 classification primarily and also Level 3 layers where information available as a query with added local knowledge and Google Earth to refine categories if necessary to provide differentiation between areas</i>
Pe LCTa	Amenity land	derived from Google Earth
PeLCTb	Tall herb and fern [bracken]	derived from querying level 2 and 3
PeLCTbw	Broadleaved woodland and scrub	derived from querying level 2 and 3
PeLCTc	Maritime cliff and slope	derived from querying level 3
PeLCTcm	Coastal heath and grassland mosaic	derived from querying levels 2 and 3- Dry Mosaic on coastal fringe with habitats defined plus Google Earth to verify areas.
PeLCTcw	Coniferous forest	derived from querying level 3
PeLCTd	Sand dune	derived from querying level 3
PeLCTgm	grazing marsh	derived from querying level 3- marshy grassland plus Google Earth to verify
PeLCTgam	Pastoral farmland	derived from level 3 as improved grassland
PeLCTgm	Grassland and semi-natural mosaic	mosaic derived from querying levels 2 and 3 with habitats defined plus Google Earth to identify some areas.
PeLCTgmm	Grassland mosaic-MOD range	derived from level 3 as grassland mosaic but identified in addition as MOD area
PeLCTgw	improved grassland with woodland	derived from querying level 3- derived from grassland and marsh classification at Level 2 and identifying additional areas of woodland within aspect area
PeLCTh	Heathland	derived from querying level 2
PeLCTi	Built up [industrial]	derived from querying level 2 and identifying specific use
PeLCTm	Mire and swamp	derived from querying level 2

<b>Nomenclature</b>	<b>Type</b>	<b>Source and comments</b>
PeLCTmf	mixed farmland	derived from querying level 3- dry mosaic . This classification describes a coarse grain/large scale mosaic better described as mixed farmland classification in some locations to differentiate from smaller scale/ grain grassland mosaics on the coast and inland
PeLCTmfw	Mixed farmland and woodland	derived from querying level 3- derived from grassland and marsh classification at Level 2 and identifying additional areas of woodland within aspect area
PeLCTmw	Mixed woodland and scrub	derived from querying levels 2 and 3
PeLCTp	Built up [port]	derived from querying level 2 and identifying specific use
PeLCTr	Built up [resort]	derived from querying level 2 and identifying specific use
PeLCTst	Beach/rough ground above HWM	area identified as intertidal in Level 3 but not included in intertidal areas identified in CCW Phase 1 intertidal EUNIS L3
PeLCTu	Built up area	derived from querying level 2 and identifying specific use
PeLCTw	Open water	derived from querying level 2
PeLCTwm	Wet mosaic	derived from querying level 2
PeLCTwom	Woodland mosaic	derived from querying level 2 woodland and scrub and using Google Earth to define as a mosaic with fields etc

### 3. Appendix C Cultural benefits and services

- 3.1. 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 Pembrokeshire seascape clearly offers these services in a number of ways.
- 3.2. We define cultural benefits and services based on the UK National Ecosystem Assessment, 2011. This provides a '*comprehensive overview of the state of the natural environment in the UK and a new way of estimating our national wealth*'. The assessment includes a review of the state of natural resources, including coastal margins and the marine environment, their value to society, and forces for change and future threats. It builds on a Natural England report NECR024 'Experiencing landscapes: capturing the *cultural* services and *experiential qualities* of landscape, October 2009.
- 3.3. A Green Paper by the Welsh Government in 2012<sup>1</sup> states that ecosystems should form the basis for a fresh approach to management and regulation of the environment in Wales. '*Wales' nature, land, water and air are our ultimate resource*'. The consultation responses to the green paper were positive agreeing with a holistic approach. A White Paper is to be produced in 2013-2014 informing the Environment Bill and Planning Bill. It is therefore crucial to collect data to inform our knowledge of the ecosystems resource.
- 3.4. The UKNEA identifies 'ecosystem cultural services' provided by the environment; which it defines 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.*'
- 3.5. It notes that '*encounters with the natural world maintain their fascination for very substantial numbers of people*' and that '*daily contact with nature is part, still, of being human*'. Interactions with green space, for example, have been linked with longevity and decreased risk of mental ill-health, and '*children's relationship with nature is a fundamental part of their development.*'
- 3.6. Evidence is noted that '*every environmental setting is capable of being interpreted as possessing a distinctive sense of place which can contribute to a range of human value needs.*' What are described as '*heritage goods*' can '*contribute to a sense of identity, place, freedom and understanding.*' It goes on to suggest that '*environmental settings are valuable surroundings for outdoor learning where engaging with nature can lead to enhanced connectedness to nature and increased ecological knowledge.*'
- 3.7. The UKNEA notes that an '*ecosystem services approach to understanding culture-nature interactions is a relatively new perspective and consequently many key sources of social, economic and environmental data are not designed to examine key aspects of cultural services and goods.*' It also notes that spiritual and religious 'goods' are provided by interaction with the natural environment, although quantifying the evidence for this is difficult.
- 3.8. Urbanisation means that '*more people have a set of local environmental settings with urban characteristics. At the same time, however, increased mobility has*

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<sup>1</sup> Sustaining a Living Wales: A green paper on a new approach to natural resource management in Wales, January 2012

*allowed more people to travel longer distances nationally and internationally to environmental settings for tourism and recreation purposes.* Places such as Pembrokeshire and its seascape therefore have a valuable role to play in delivering cultural ecosystem services. Broad categories of what the Pembrokeshire seascape offers are set out in Table 1 in the main report as a framework for the brief descriptions for each seascape character area.

## 4. Appendix D Forces for change

- 4.1. The seascape of Pembrokeshire is undergoing change through a number of natural and man-related forces. These forces for change are explored and defined to ensure consistent use and to avoid repetition in the individual SCA descriptions.
- 4.2. The National Park Management Plan notes the ways of 'particular significance' in which the appearance and integrity of the landscape may be under threat:
- **Climate change** and responses to it
    - The UK's National Security Strategy (March 2008) cites climate change and competition for energy as key challenges, and also makes reference to security of food and water supplies, the longer term impact of climate change from habitat fragmentation and environmental degradation to energy-hungry food production and fuel poverty.
    - Climate change may, specifically, put pressure on wildlife and marine fish populations as well as coastal scenery.
    - It may also affect farming, particularly in terms of crop suitability, growing seasons, availability of drinking water and shade, effects on livestock, and losses to soils (and consequent soil run off to water courses) and trees or hedgerows
    - Some areas may become inaccessible due to flooding or instability, including coastal paths or recreational areas.
  - **Land management practices**, which have particular implications for semi-natural habitat and its wildlife, and for management of natural stocks and flows, such as soils and water. Traditional farming practices, such as extensive grazing, are critical contributors to the character of the landscape, yet farming continues to suffer an uncertain future with an aging farming population and more part time farmers, with barely viable businesses. Farming is also very vulnerable to fuel price changes and consequent cost of input materials such as fertiliser and feed.
  - **Development** - the National Park has a very limited landscape capacity for development in general and for housing in particular. Development proposals must be considered against the special qualities listed at para 4.56 of the Pembrokeshire Coast Local Development Plan (to 2021); LDP Strategy Policy 8 and Policy 15 in particular apply.
- 4.3. The National Park Management Plan notes that factors particularly likely to affect **remoteness and tranquillity** in the National Park are:
- visible development or intensive land use,
  - traffic noise,
  - light,
  - intrusive noise from recreational activity,
  - firing on the ranges,
  - waste and litter, and
  - activity arising from mineral and aggregate workings.
- 4.4. **Tourism and recreational use** of the National Park, whilst one of its core functions, can also have significant impacts, such as erosion of paths, effects of parking and road access, noise from power craft in particular, and impacts on



fauna. The Pembrokeshire Coastal Forum are working to ensure that adventure activities such as coasteering, kayaking and cliff climbing, do not impact on the environments and wildlife of Pembrokeshire

- 4.5. A number of areas and settlements have been identified as at risk from the **effects of storms and sea level rise** over the next decade. The shoreline management planning process is largely concerned with managing these flood risks and associated potential impacts. Shoreline Management Plans are non-statutory documents. The latest plans for the Pembrokeshire coast were prepared in 2000 by WS Atkins. New plans are in the process of being developed.
- 4.6. Pembrokeshire is being promoted as a Hub for Marine Renewables. Marine energy is being researched with proposals such as tidal turbines in Ramsey Sound.
- 4.7. The UKNEA examines the trends for change throughout the UK. Findings for coastal margins and marine areas are set out below:

**Table D1: Relative importance of, and trends in, the impact of direct drivers on Broad Habitat extent and condition.**

<i>Location</i>	<i>Habitat Change</i>	<i>Pollution &amp; Nutrient Enrichment</i>	<i>Over-exploitation</i>	<i>Climate Change</i>	<i>Invasive Species</i>
<b>Coastal margins</b>	Moderate, increasing	Very High, continuing	Low, decreasing	High, increasing	Moderate, increasing
<b>Marine</b>	Moderate, increasing High and increasing impact on wild fish.	Moderate, decreasing	Very high, increasing	Moderate, increasing	Low, increasing

- 4.8. The UKNEA continues to explain these changes in more detail.
  - **Coastal Margins:** Coastal Margin habitats have declined in extent, by about 10%, and quality in the last 60 years due to development and coastal squeeze. Sand dune and saltmarsh have been lost due to agricultural improvement and forestry, as well as land-claim, while rapid coastal development for industry, housing, military activities and tourism has affected all habitats. The quality of these habitats has been impacted by widespread installation of artificial sea-defence structures and increased armouring of soft cliffs, which reduces sediment supply and natural dynamics, crucial to contributing to protection elsewhere. Furthermore, reductions in traditional forms of management, such as grazing of levees, have led to the risk of increased erosion and potential flooding (TR 11.2).
  - **Marine:** The Marine habitats around the UK deliver a very wide range of ecosystem services and goods of value to society. However, the delivery of many of these provisioning and regulating services in the Marine environment are declining because of heavy exploitation and sea temperature rise associated with climate change. Wild fisheries are declining, while trawling also has an adverse effect on seabed life, which plays a key role in cycling nutrients crucial to ensuring the productivity of the seas. The breakdown of waste and detoxification of freshwater runoff appears to be keeping pace but is locally problematic in estuaries and coastal waters. Increasing sea temperatures also raise concerns about the potential outbreak of pathogens (TR 12.3).

- 4.9. Whilst these may not correspond exactly with what is happening in Pembrokeshire it sets the national context.
- 4.10. In relation to Pembrokeshire other particular forces for change apply. The use of the safe deep water harbour of Milford Haven for the importation of oil and gas has resulted in associated oil storage, refineries and power station. The use of Castlemartin and Manorbier areas for military firing ranges provide a further distinctive effect on the seascape.
- 4.11. The broad categories of what forces for change in Pembrokeshire's seascape are set out in **Table D2** as a framework for the brief descriptions for each seascape character area.

Table D2 Forces for change

Natural processes and emerging climate change	
Threat to what	Nature of threat
Coastal Splendour Islands Diversity of Landscape Remoteness, Tranquillity and Wilderness	Effects on seascape character and visual amenity through: <ul style="list-style-type: none"> <li>erosion or sedimentation altering the character of the coastline eg removal of sand from beaches</li> <li>increased frequency of extreme weather eg storms exacerbating flooding and erosion eg dunes, shingle beaches.</li> <li>sea defences and flood protection measures affecting natural character of coastline in low lying areas eg dunes, shingle beaches</li> </ul>
Diverse Geology Richness of Habitats and Biodiversity	<ul style="list-style-type: none"> <li>coastal erosion leading to direct loss of habitat eg cliff top semi-natural heathland, dunes</li> <li>increased flooding affecting low-lying habitats</li> <li>habitat fragmentation, for example in estuarine ecosystems</li> </ul>
Rich Archaeology Distinctive Settlement Character Cultural Heritage	<ul style="list-style-type: none"> <li>coastal erosion leading to potential loss of archaeological resource eg coastal prehistoric forts</li> <li>Sea defences and flood protection measures affecting natural character of traditional vernacular of settlement eg harbours</li> <li>stress to buildings and other man made features from extreme weather events and flooding</li> <li>inundation of historic coastal landscapes</li> </ul>
Accessing the Park Space to Breathe	<ul style="list-style-type: none"> <li>erosion of coastline blocking or diverting coastal path or access to open access land or other recreational areas</li> <li>flooding blocking or diverting coastal path or access to recreational areas</li> <li>change in coastal processes eg sedimentation or threat of flooding changing use of harbours or anchorages</li> <li>weather-related changes to patterns of tourism and recreational activity</li> </ul>
Marine/water activity	
Threat to what	Nature of threat
Coastal Splendour Islands Diversity of Landscape Remoteness, Tranquillity and Wilderness	Effects on seascape character, visual amenity and tranquillity through: <ul style="list-style-type: none"> <li>offshore wind, tidal or wave energy installations</li> <li>other offshore development such as rigs</li> <li>dredging- boats and infrastructure</li> <li>commercial shipping movements and anchorages eg tankers, ferries</li> <li>increasing recreational/tourism boat trips and motor watersports eg powerboats and ribs around Ramsey</li> <li>increasing non motor powered boat and small craft use eg canoes</li> <li>visitor litter and seasonal waste</li> <li>marine rubbish, tank cleaning and oil spills on physical environment and visual quality</li> <li>MOD uses including firing ranges</li> <li>fishing intensification eg potting</li> <li>user conflicts eg anglers and powerboats</li> </ul>
Diverse Geology Richness of Habitats and Biodiversity	<ul style="list-style-type: none"> <li>increasing recreational/tourism boat trips and leisure sailors motor on sensitive marine habitats and breeding populations eg marine nature reserves and estuarine habitats</li> <li>impacts of marine rubbish, tank cleaning and oil spills on wildlife and habitats</li> <li>impacts of wind, tidal or wave energy installations eg on bird populations</li> <li>effects of dredging on seabed</li> </ul>

	<ul style="list-style-type: none"> <li>• effects of fishing such as trawls and dredging on seabed and on associated habitats</li> <li>• increasing pressure on fish populations from exploitation</li> <li>• effects of static fishing such as baited pots and fixed lines</li> <li>• physical effect on seabed and associated habitats of MOD firing range</li> <li>• erosion of estuary banks from high-speed motor craft</li> </ul>
Rich Archaeology Distinctive Settlement Character Cultural Heritage	<ul style="list-style-type: none"> <li>• direct effects and effects on the setting of heritage features through tourism development, commercial, energy and rural diversification</li> <li>• loss of traditional small boat fisheries and associated processing and distribution infrastructure</li> </ul>
Accessing the Park Space to Breathe	<ul style="list-style-type: none"> <li>• MOD uses including firing ranges restrict access to sea</li> <li>• Motorised leisure craft can cause disturbance to other users/feeling of space to breathe</li> <li>• Commercial marine and energy users can cause disturbance to other users/feeling of space to breathe</li> </ul>
<b>Coastal development and marine related activity</b>	
<b>Threat to what</b>	<b>Nature of threat</b>
Coastal Splendour Islands Diversity of Landscape Remoteness, Tranquillity and Wilderness	<p>Effects on seascape character, visual amenity and tranquillity through:</p> <ul style="list-style-type: none"> <li>• oil and natural gas harbour/port, storage, processing facilities and users eg refineries, oil and liquid gas tanks, gas fired power station, power lines and pipelines on coast</li> <li>• intensification of ferry port use and associated infrastructure on the coast</li> <li>• energy infrastructure related to offshore energy development such as sub stations and power lines.</li> <li>• wind turbine development onshore</li> <li>• solar photovoltaic panels, at field scale or on building roofs</li> <li>• tourism development infrastructure, such as marina development parking and visitor facilities, paths, slipways, moorings etc</li> <li>• development/pressure of tourist accommodation eg new caravan parks or extensions, campsites</li> <li>• increasing use of coast for active sports eg coasteering, climbing, walking, beach related activity</li> <li>• visitor pressure on honeypots including wear and tear, litter, parking.</li> <li>• new housing or other development potentially suburbanising coast and not responding or respecting landscape or settlement character</li> <li>• light pollution from commercial, residential and tourist accommodation</li> <li>• MOD uses including firing ranges</li> <li>• particular pressure of all of the above on the undeveloped coast.</li> </ul>
Diverse Geology Richness of Habitats and Biodiversity	<ul style="list-style-type: none"> <li>• sea defences causing loss of or changes to coastal habitats eg dune and saltmarsh</li> <li>• direct loss of land or habitat from new buildings such as for housing, tourism or other development structures including roads/parking and access provision</li> <li>• indirect effects on habitat and local ecosystems such as habitat fragmentation or impact on breeding bird populations</li> <li>• increased development leading to pollution of water or air and additional waste management implications</li> <li>• increased recreational activity and access leading to trampling, disturbance or erosion impacts on habitat eg semi natural coastal heathland vegetation</li> <li>• invasion of bracken into semi-natural coastal habitats eg heathland</li> <li>• effect on fauna of light pollution from development</li> </ul>

Rich Archaeology Distinctive Settlement Character Cultural Heritage	<ul style="list-style-type: none"> <li>• effects on the sense of remoteness and tranquillity</li> <li>• erosion of coast and threat to coastal heritage eg cliff forts or harbours</li> <li>• neglect of heritage features eg in estuary and on coast</li> </ul>
Accessing the Park Space to Breathe	<ul style="list-style-type: none"> <li>• effect on coastal path continuity of exclusion zones relating to use of firing range</li> <li>• direct impacts/erosion of walkers/bikers/horse riders on paths bridleways and lanes eg coastal path erosion</li> <li>• pressure on honeypots such as embarkation points for boat trips including parking and congestion</li> <li>• visitor pressure and numbers can conflict with 'space to breathe'</li> </ul>
<b>Land management</b>	
<b>Threat to what</b>	<b>Nature of threat</b>
Coastal Splendour Islands Diversity of Landscape Remoteness, Tranquillity and Wilderness	<p>Effects on seascape character, visual amenity and tranquillity through:</p> <ul style="list-style-type: none"> <li>• intensification of agriculture such as grass 'improvement' of unimproved grass, overgrazing and polytunnels</li> <li>• abandonment of agricultural land with incursion of bracken and scrub</li> <li>• reduced maintenance/management or removal of elements of landscape eg field boundaries such as Pembrokeshire hedgebanks and walls and introduction of fences leading to degraded landscapes,</li> <li>• farm/rural diversification to tourism uses, selling off farm dwellings or buildings for second homes or holiday homes changing settlement character and pattern</li> <li>• onshore wind turbines and other renewable energy such as solar voltaic panels</li> <li>• an increase in forestry and woodland and changes in management eg for biomass heating systems, and associated processing and storage areas, could change landscape character inland [eg Daugleddau]</li> <li>• Intensification of tourism and commercial activities could increase congestion of roads, traffic noise and demand for parking and other infrastructure could change the tranquillity and character of the area</li> <li>• MOD uses including structures and firing ranges</li> </ul>
Diverse Geology Richness of Habitats and Biodiversity	<ul style="list-style-type: none"> <li>• intensification of agriculture such as grass 'improvement', new crops, overgrazing or removal of hedge banks leading to loss of biodiversity</li> <li>• loss of or reduction in agricultural management through non-viability of farm business, leading to incursion by scrub and ruderal species, and loss of species-rich pasture which depends on grazing</li> <li>• changes in forestry management or new areas of commercial forestry</li> <li>• pollution of water courses and marine ecosystem from nutrient run-off / enrichment</li> <li>• MOD uses generally positive for biodiversity but physical effect on land/habitats of exploding munitions</li> </ul>
Rich Archaeology Distinctive Settlement Character Cultural Heritage	<ul style="list-style-type: none"> <li>• reduced agricultural management leading to loss of distinctive features of landscape including historic field systems, hedge banks and walls</li> <li>• reduced management of parks and gardens</li> <li>• impacts of changing food marketplace on viability of raising heritage breeds of farm animals</li> </ul>
Accessing the Park Space to Breathe	<ul style="list-style-type: none"> <li>• increase in infrastructure including main roads reducing tranquillity</li> <li>• pressure on honeypots including parking and congestion</li> <li>• congestion on narrow roads leading to coast with associated effects on highway detailing and signage</li> </ul>

## 5. Appendix E Sensitivity of seascape character areas

- 5.1. We define sensitivity within the framework of Countryside Agency Topic Paper 6 and LCA guidance. Though the brief states that the *inherent* sensitivity of an SCA should be addressed, it also mentions that the study needs to explore sensitivity to different types of development citing the Regional Seascape Assessment [RSA] in relationship to offshore renewable energy as a template. We therefore examine the different characteristics of SCAs and where they may be more or less sensitive to development- see **Table E1**. This table acts as the framework for discussion of sensitivity to relevant forces for change for each SCA.
- 5.2. Landscape designations and their associated value should be considered separate to judgements on sensitivity. Designations are derived through a number of criteria, some subjective, including scenic beauty, wildness, cultural associations and necessarily involve consensus. Boundaries are placed along easily defined permanent features on the ground such as roads. As such, there can be areas of varying value within a designation, as indicated by LANDMAP studies, and also areas of varying sensitivity. However, it would not be surprising if there was an increased incidence of sensitivity in designated areas due to their intrinsic characteristics.

**Table E1: Factors affecting the sensitivity of seascape character areas**

<i>Criteria</i>	<i>Factors that add to sensitivity</i>	<i>Factors that detract from sensitivity</i>
<b>Heritage features</b>	Presence of wrecks and other submerged historic features.  Presence of coastal and island historic features such as forts, castles, chapels, monasteries, other buildings and structures and other heritage features which have a strong relationship with the coast and sea visually, physically or culturally.	Limited number or no heritage features
<b>Nature Conservation features</b>	Presence of marine habitats with high biodiversity. Presence of intertidal and coastal edge habitats with high biodiversity. Presence of BAP species or habitats.	Limited range and extent of biodiverse areas.
<b>Cultural associations</b>	Where there are strong collective cultural associations with the sea and coast through people and events and their expression through literature, art, music or other media. These can include religious connections, military connections, legends, books and poems, pictures, music, films, plays and other cultural media.	Where there are limited cultural associations.
<b>Scale</b>	Small scale, enclosed, views to horizon limited by landform  Introduction of an element of scale into previously un-scaled area  Where scale is huge and smaller elements would detract	Large scale views
<b>Openness and enclosure</b>	Where openness is a key characteristic and introduction of built elements would compromise this.	Unframed open views unimpeded by natural elements or features.


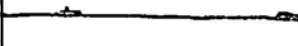

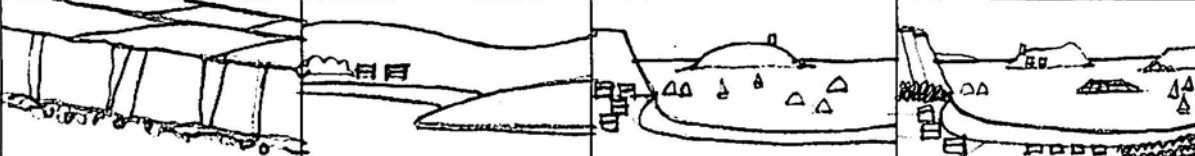
<i>Criteria</i>	<i>Factors that add to sensitivity</i>	<i>Factors that detract from sensitivity</i>
<b>Coastal and hinterland form</b>	<p>Intricate, complex, rugged forms and dramatic headlands/ends of peninsulas</p> <p>Where great simplicity is the key characteristic and introduction of structures into very horizontal composition would compromise this.</p> <p>Gently sloping towards coast allowing views of near shore elements.</p>	<p>Flat, horizontal or gently undulating or indented coast.</p> <p>Simple forms</p> <p>Plateau or flat hinterland.</p>
<b>Settlement/ Development pattern and foci</b>	<p>Small scale, traditional, historic settlements and monuments. Small clustered villages.</p> <p>Lack of infrastructure</p>	<p>Ports, industrial facilities, larger scale infrastructure, urban form, linear settlements</p>
<b>Seascape Pattern and Foci</b>	<p>Complex or unified pattern which would be disrupted by development.</p> <p>Important focal points eg islands, islets, headlands, distinctive sweeping beaches, and high hills.</p> <p>Open unspoilt views of the sea with no signs of development offshore.</p>	<p>Simple pattern</p> <p>Lack of natural focal points</p> <p>Presence of existing vertical or other elements at sea including shipping/ferries.</p>
<b>Movement</b>	<p>Where stillness is a key feature</p> <p>Where/when movement is highly natural, irregular or dramatic (currents, tidal streams, waves crashing on exposed coastlines) and regular mechanical movement or presence of development would detract.</p>	<p>In busier areas where development movement relates to other forms of mechanical movement present e.g. commercial shipping, ferries, boats, cars, lorries, aircraft or to a lesser extent other movement eg crowded swimming and surfing beaches</p> <p>Where/when waves are gentler and slow, regular movement of development could complement lapping of waves.</p> <p>Where clear current gives meaning/purpose to tidal renewable energy.</p>
<b>Dark skies/ Lighting</b>	<p>Where the area is unlit at night and is classified as such in dark skies study.</p> <p>Little impact of lights from sea and land traffic.</p> <p>Where lighting is from scattered small settlements, lighthouses etc and where marine development lighting would introduce a new, different scale.</p>	<p>Area is already well lit at night</p> <p>Lights of sea and land traffic or installations present.</p>

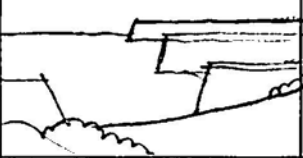
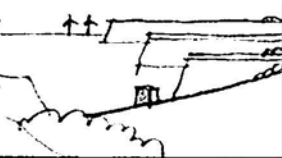

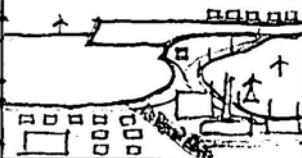

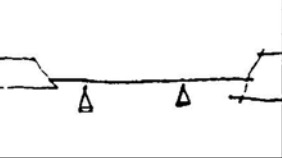



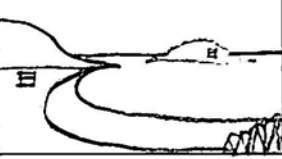
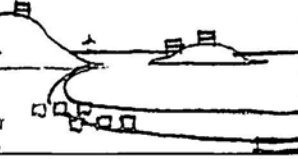



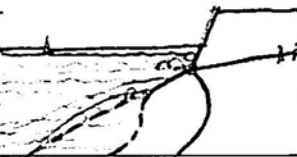
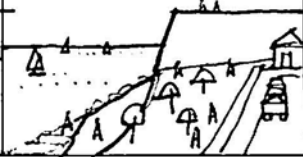
<i>Criteria</i>	<i>Factors that add to sensitivity</i>	<i>Factors that detract from sensitivity</i>
<b>Aspect</b>	Development would interfere with sunrises and particularly sunsets  Where turbines would be most often backlit, thereby increasing visibility.  Front lit development from higher level views.	Development located away from sunrise and sunset positions  Development front lit
<b>How seascape is experienced</b>	From remote little use stretch of sea with little shipping or boat use.  From secluded coastline, intimate coastal roads and footpaths.  From important viewpoints and elevated positions where the focus is the view and not the activity.	From ferry/shipping.  From main coastal, busy roads.  Crowded beaches where focus is on beach activities.
<b>Remoteness, Tranquillity, Wildness</b>	Undeveloped seascape  Wild character  Highly natural, unmanaged  Remote or isolated  Tranquil	Highly developed seascape  Highly modified / managed.  Not remote  Lacking in tranquillity
<b>Exposure</b>	Sheltered and calm seascapes  Where seascape is extremely exposed such that the perceived wild, elemental nature is a key characteristic and development would significantly change this perception.	Open, exposed seascapes which does not provide a perception of elemental or wild seascape character and development would be perceived as relating to these characteristics.

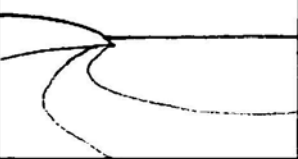
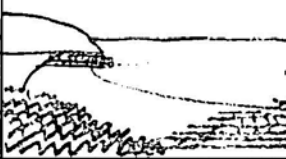


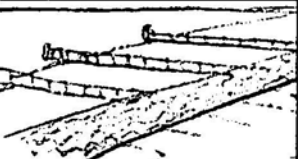



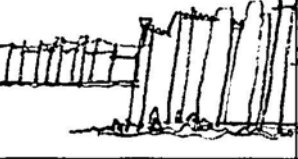
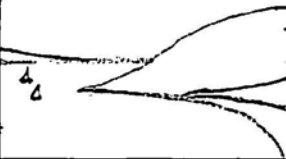
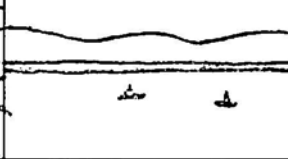
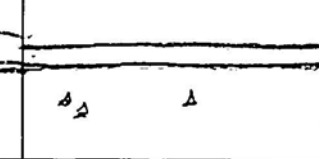
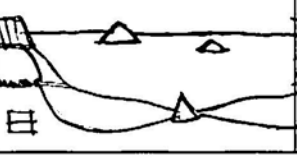
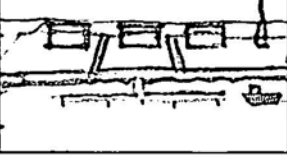

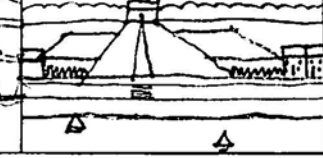


## **6. Appendix F Aesthetic and perceptual factors**

- 6.1. Aesthetic and perceptual factors have been considered in a structured way in undertaking the seascape character assessment. This information could not be fully researched as part of the desk study and so was 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. In order to achieve consistency of use each term is 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 were used as a checklist for the site surveys/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 terms and definitions are shown in **Table F1**. The list is not entirely comprehensive and other terms are used in descriptions of an area to suit particular situations at the seascape assessor's discretion.

AESTHETIC ASPECTS OF SEASCAPE CHARACTER				
<b>Scale</b>				
Intimate	Elements and spaces of a predominantly personal scale, such as private moorings and curtilages			
Small	Elements and spaces of a community scale, such as small harbours, coves, islands/islets.			
Medium	Elements and spaces which are of a moderate scale, in that they are neither extensive nor intensive such as bays, towns, straits.			
Large	Elements and spaces which extend to cause the observer to feel small, such as large bays or high cliffs or coastal hills			
Vast	Elements and spaces where the coast is a minor or minimal visual element such as offshore or in very large bays			
<b>Scale examples</b>	Intimate	Small	Medium	Large
				
				Vast
				
<b>Enclosure</b>				
Confined	Presents the observer with close spaces such as in thick coastal woodland, narrow coastal gorges or clefts; likely to see relatively little sky			
Enclosed	Presents the likely observer with short distance views to a high horizon on at least two sides, such as from most valley bottoms leading to the coast			
Open	Presents the likely observer with predominantly eye level horizons, such as lowlands and cliff-less coastal areas			
Expansive/Exposed	Presents the likely observer with far-distance horizons, such as at sea away from the coast, on cliff-tops, on coastal hilltops etc			
<b>Enclosure examples</b>	Confined	Enclosed	Open	Expansive
				
<b>Diversity</b>				
Uniform	Unvarying in texture, form, colour, etc with a single recognisable pattern of visual elements.			
Simple	Little variation in texture, form, colour, etc with only a narrow range of visual elements			
Diverse	Widespread variation in texture, form, colour, etc with a broad range of visual elements			
Complex	Complete variation in texture, form, colour, etc with little or no recognisable pattern of visual elements			
<b>Diversity examples</b>	Uniform	Simple	Diverse	Complex
				

<b>Unity</b>				
Unified	An area where there is a strong sense of unity of character, patterns and elements.			
Interrupted	An area which is broadly unified in character with some features or elements which are out of character and which disrupt the unity			
Fragmented	Patches of areas of unified character are broken up by other elements and features which are out of character			
Disunity	An area where there is no or limited unity between seascape or landscape patterns or elements.			
Unity examples	Unified	Interrupted	Fragmented	Chaotic
				
<b>Visual Dynamic</b>				
Panoramic	Uninterrupted view in most directions			
Framed	View framed by landform or other elements			
Intermittent	View between elements, closed off in places			
Channelled	View channelled down a linear feature by landform or other elements			
Visual Dynamic	Panoramic	Framed	Intermittent	Channelled
				
<b>Balance</b>				
Harmonious	All the characteristics/features/elements visually contribute to a harmonious composition			
Balanced	Most characteristics/features/elements visually contribute to a balanced composition or unity			
Discordant	Some characteristics/elements visually disrupt and detract from a balanced composition or unity			
Chaotic	Characteristics/elements visually compete and disrupt each other to create a chaotic composition.			
Balance	Harmonious	Balanced	Discordant	Chaotic
				
<b>Movement</b>				
Still	No movement			
Calm	Very limited movement			
Restful/rhythmic	Movement that is gentle, far away or rhythmic which does not cause disturbance			
Busy	Movement usually involving a number of people or machines			
Movement examples	Still	Calm	Restful/rhythmic	Busy
				

<b>Texture</b>				
Smooth	Consistent cover with smooth appearance e.g. calm water, large beach, coastal grassland.			
Textured	Moderately textured sea and land cover eg moderately disturbed sea surface, shingle beaches, some rocks, coastal scrub vegetation.			
Rough	Coastal cover with coarse texture due to intrinsic nature of cover e.g. rocks, rocky islets, rocky cliffs, disturbed water, mosaic vegetation patterns			
Very rough	Significant rock exposures in forms of rocky islets, jagged cliffs and littoral rocks, turbulent water			
<b>Texture examples</b>	Smooth	Textured	Rough	Very rough
				
<b>Form</b>				
Straight	Predominantly straight lines such as in a straight beach, groynes, jetties, rectilinear field system e.g. levels.			
Angular	Predominantly straight lines at a variety of angles such as in a rugged coastal landscape with cliffs or a strong field system.			
Curved	Predominantly curved lines possibly dominated by gentle landform such as a sweeping bay.			
Sinuuous	Predominantly sinuous lines possibly defined by fluvial patterns such as estuaries or rias			
<b>Form examples</b>	Straight	Angular	Curved	Sinuuous
				
<b>Line</b>				
Vertical				
Sloping				
Rolling				
Rolling				
<b>Line examples</b>	Vertical	Sloping	Rolling	Horizontal
				
<b>Colour</b>				
Monochrome	A predominance of neutral colours or monotones such as found offshore at a distance from the coast.			
Muted	A predominance of neutral colours possibly closer to, or on the coast, on farmland, cliffs, dunes and hill sides or woodland for most of the year.			
Colourful	A predominance of more bold colours and tones, such as cliff paths in late spring/early summer, coloured rocks or building materials/structures in rural locations			
Garish	A predominance of bold colours with little recognisable pattern, such as commercial signage amid bold natural colours			
Moderate contrasts	Moderate contrasts between vegetation types such as bracken, heather and pastures.			
Strong contrasts	A predominance of bold contrasts between just a few strong colours or tones, such as dark cliffs against a pale background			
<b>Pattern</b>				
Random	Characteristics/elements do not appear to have a purposeful relationship with each other			
Organised	Characteristics/elements have a purposeful relationship with each other			
Regular	Characteristics/elements are consistent and regular.			
Formal	Characteristics/elements have a formal designed relationship with each other.			
<b>Pattern examples</b>	Random	Organised	Regular	Formal
				

## 7. Appendix G: Glossary and Abbreviations

<i>Term</i>	<i>Definition</i>
<b>Seascape, marine and coastal processes terms</b>	
<b>Abrasion</b>	The mechanical wearing effect on rocks caused by corrosion. The abrading agent can take a variety of forms e.g. sand, pebbles or boulders moving across a rock surface.
<b>Attrition</b>	The mechanism by which the particle size of any material is reduced by friction during transport.
<b>Biogenic</b>	A feature that is created by living organisms, either animal or plant.
<b>Character</b>	see Seascape character.
<b>Characteristics</b>	elements, features and qualities which make a particular contribution to distinctive character. *
<b>Characterisation</b>	the process of identifying areas of similar character, classifying and mapping them and describing their character. *
<b>Classification</b>	concerned with dividing the seascape into areas of distinct, recognisable and consistent common character in grouping areas of similar character together. It requires the identification of patterns in the seascape, created by the way the natural and human influences interact and are perceived and experienced to create character in the seascape. *
<b>Description</b>	capturing the overall essence of the character of the seascape, with reference to geology, landform, bathymetry, habitats, use of the coast and sea, cultural associations etc, drawing out the ways in which these factors interact together and are perceived and experienced and are associated with events and people. *
<b>Demersal</b>	In relation to marine organisms: those which flourish on the ocean floor.
<b>Elements</b>	individual component parts of the seascape such as beaches, cliffs, submerged reefs, sea walls, groynes and rocky outcrops.
<b>Features</b>	particularly prominent or eye-catching elements such as lighthouses, rock stacks and coastal cliffs.
<b>Fetch</b>	The distance of open water across which wind blows or over which wind generated water wave travels, unobstructed by major land obstacles. The amount of fetch helps to determine the magnitude and energy of a wave and therefore its erosional or depositional tendencies on neighbouring shorelines.
<b>Hydraulic action</b>	Force exerted by moving water on rocks eg air forced into cracks in solid rocks by breaking waves is capable of causing their disintegration by expanding the fissures.
<b>Key characteristics</b>	those combination of elements which help given area its distinct sense of place. They can in many cases to be 'positive' characteristics but they may also in some cases be 'negative' features which nevertheless are important to the current character of the seascape. *
<b>Landward limits (of a seascape character assessment)</b>	the distance which the seascape character assessment will expand onshore and inland. Such considerations relate to the mainland, peninsulas and islands, regardless of their distance out at sea. The extent is dependent on the purpose and/or scope of the assessment being undertaken.

<b>Littoral</b>	Pertaining to a shoreline.
<b>Longshore drift</b>	A general movement of beach material along the shoreline due to the effect of waves breaking obliquely on to the beach.
<i>Term</i>	<i>Definition</i>
<b>Pelagic</b>	In relation to the environment: the open ocean as distinct from the ocean floor. In relation to marine organisms: those which flourish independent of the ocean floor and shoreline environments.
<b>Perception</b>	perception combines the sensory (that which we receive through our senses) with the cognitive (knowledge and understanding gained from many sources and experiences). **
<b>Reef</b>	A line of rocks or material in the tidal zone of the coast, submerged at high water but partly uncovered at low water.
<b>Ria</b>	Submerged coastal valley or estuary resulting from a rise of sea level, often associated with post-glacial coasts.
<b>Saltation</b>	Sediment transported by bouncing or hopping along a surface carried by water or wind.
<b>Seascape</b>	An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors. *
<b>Seascape character</b>	Seascape character is a distinct and recognizable pattern of elements in the seascape that makes one seascape different from another, rather than better or worse. *
<b>Seascape character assessment (SCA)</b>	SCA is the process of identifying and describing variation in the character of the seascape, and using this information to assist in managing change in the seascape. It seeks to identify and explain the unique combination of elements and features that make seascape distinctive. *
<b>Seascape character areas</b>	these are single unique areas which are discrete geographical areas of a particular seascape character. Each has its own individual character and identity. These areas may be made up of a number of seascape types.
<b>Seascape character types</b>	these are distinct types of seascape that are relatively homogenous in character. They are generic in nature in that they may occur in different locations but wherever they occur they share broadly similar combinations of bathymetry, seabed geology and wave climate characteristics.
<b>Seascape guidelines</b>	actions required to ensure that distinctive seascape character is maintained, enhanced or if appropriate, changed through the creation of new character. *
<b>Seascape quality</b>	the physical state of the seascape. It includes the extent to which typical character is represented in individual areas, sometimes referred to as strength of character, the intactness of the seascape from visual, functional and ecological perspectives and the condition or state of repair of individual elements of the seascape.*
<b>Seascape sensitivity</b>	the ability of the seascape to respond to and accommodate change. It reflects the seascape character, the nature of change in the way both are perceived and experienced by people.*
<b>Seascape strategy</b>	the objectives and overall vision of what the seascape should be like in the future, and what is thought to be desirable for a particular seascape character type or area, as a whole.*
<b>Seascape, Landscape</b>	is an established methodology which is used to assess the impact of the

<b>and Visual Impact Assessment (SLVIA)</b>	development or other use change on seascape, landscape and visual amenity. It includes analysis of the effects during the construction, operation and decommissioning phases of the development, including any restoration or after uses.
<i>Term</i>	<i>Definition</i>
<b>Seaward limits (of an SCA)</b>	distance out to sea that the SCA will extend.
<b>Slack</b>	An area of almost motionless water.
<b>Suspension</b>	The process by which lightweight materials are transported by moving water in the zone of turbulent flow.
<b>Swash</b>	The movement of a turbulent layer of water up the slope of the beach as a result of the breaking of a wave. It is capable of moving beach material of substantial size and is an important element in longshore drift.
<b>Swell</b>	A regular movement of marine waves created by wind stress in the open ocean.
<b>Traction</b>	Solid load carried by water.
<b>Other terms associated with landscape</b>	
<b>Amenity (Planting)</b>	planting to provide environmental benefit such as decorative or screen planting.
<b>Analysis</b>	the process of dividing up the seascape/landscape into its component parts to gain a better understanding of it.
<b>Ancient Woodland</b>	land continuously wooded since AD 1600. It is an extremely valuable ecological resource, usually with a high diversity of flora and fauna.
<b>Apparent</b>	object visible in the seascape/landscape.
<b>Approach</b>	the step-by-step process by which seascape/landscape assessment is undertaken.
<b>Arable</b>	land used for growing crops other than grass or woody species.
<b>Aspect</b>	in Wales, an aspect is a component of the LANDMAP information recorded, organised and evaluated into a nationally consistent spatial data set. The landscape information is divided into five aspects-geological landscape, landscape habitats, visual and sensory, historic landscape and cultural landscape.
<b>Aspect area</b>	areas defined in each of the LANDMAP aspect assessments which are mutually exclusive
<b>Assessment</b>	term to describe all the various ways of looking at, analysing, evaluating and describing the seascape/landscape or assessing impacts on seascape/landscape and visual receptors.
<b>Biodiversity</b>	the variety of life including all the different habitats and species in the world.
<b>Conservation</b>	the protection and careful management of natural and built resources and the environment.
<b>Carr</b>	woodland in waterlogged terrain. Characteristic species include alder, willow and sallow.
<b>Clawdd/cloddau</b>	earth bank or mound relating to a hedge faced with stone in some areas
<b>Complexity</b>	[in the context of describing a skyline]how varied or complicated the skyline is from dead flat with even vegetation at one end of the scale to



	mountainous with varied vegetation at the other.
<b>Coppicing</b>	the traditional method of woodland management in which trees are cut down near to the ground to encourage the production of long, straight shoots that can be harvested.
<i>Term</i>	<i>Definition</i>
<b>Consistent</b>	relatively unchanging element or pattern across a given area of seascape/landscape.
<b>Cultural heritage asset</b>	see heritage asset
<b>Cultural pattern</b>	expression of the historic pattern of enclosure and rural settlement.
<b>Cumulative impacts/effects</b>	either additional changes caused by a proposed development in conjunction with similar developments or the combined effect of a set of developments, taken together
<b>Distinctiveness</b>	see sense of place
<b>Diversity</b>	[in terms of the function of an area] the variety of different functions of an area.
<b>Dominant</b>	main defining feature or pattern.
<b>Effects</b>	term used in environmental impact assessment [EIA] where effects are changes arising from the action, operation or implementation of a proposed development.
<b>Effects, direct</b>	where development lies within a seascape/landscape and physically removes an element or feature eg rocks, cliff, coastal vegetation
<b>Effects, indirect</b>	effects away from the development such as perceived change of character or from associated development such as transport infrastructure
<b>Field Boundary</b>	the defined edge of a field whether fence, hedge, bank, ditch or wall.
<b>Field Size</b>	Large 2 Ha Above, Medium Around 1.5 Ha, Small Less Than 1 Ha.
<b>Geology</b>	the study of the origin, structure, composition and history of the Earth together with the processes that have led to its present state.
<b>Ground Type</b>	expression of the soil forming environment and its influence in determining the surface pattern of vegetation and land use.
<b>Hedge</b>	fence of shrubs or low trees, living or dead, or of turf or stone. Though strictly a row of bushes forming a hedge, hedgerow has been taken to mean the same as a hedge.
<b>Hedge bank</b>	earth bank or mound relating to a hedge
<b>Heritage asset</b>	a building, monument, site, place, area or landscape positively identified as having a degree of historical significance meriting consideration in planning decisions. Designated heritage assets include world heritage sites, scheduled ancient monuments, protected wreck sites, battlefields, listed buildings and registered parks and gardens.
<b>Horticulture</b>	intensive form of cropping, such as vegetables or fruit.
<b>Impact</b>	used as part of overall term, as in EIA or LVIA, to help describe the process of assessing potentially significant effects- see effects.
<b>Improved [in relation to soils or pasture]</b>	addition of fertiliser and, in the case of pasture, reseeding with more productive grass species.



<b>Inherent</b>	dictionary definition- 'existing as an inseparable part'. In the context of sensitivity means the sensitivity of the seascape/landscape zone itself with all its component elements and features rather than its relationship with adjacent zones.
<b>Integrity</b>	unspoilt by large-scale, visually intrusive or other inharmonious development
<i>Term</i>	<i>Definition</i>
<b>Landcover</b>	combinations of natural and man-made elements including vegetation that cover the land surface.
<b>Landform</b>	combinations of slope and elevation which combine to give shape and form to the land.
<b>LANDMAP</b>	<i>LANDMAP</i> is the national Geographical Information System (GIS) based information system for Wales, devised by the Countryside Council for Wales, for taking landscape into account in decision-making. It is a nationally consistent dataset divided into 5 aspects- geological landscapes, landscape habitats, visual and sensory, historical landscapes and cultural landscapes.
<b>Landscape</b>	an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors
<b>Landscape and Visual Impact Assessment (LVIA)</b>	is an established methodology which is used to assess the impact of the development or other use change on landscape and visual amenity. It includes analysis of the effects during the construction, operation and decommissioning phases of the development, including any restoration or after uses. (GLVIA 2002)
<b>Landscape Character</b>	a distinct, recognisable and consistent pattern of elements, features and qualities in the landscape that makes one landscape different from another, rather than better or worse.
<b>Landscape Character Area [LCA]</b>	these are single unique areas which are discrete geographical areas of a particular landscape character. Each has its own individual character and identity. These areas in Wales are primarily derived from LANDMAP aspects.
<b>Landscape Resource</b>	The overall stock of the landscape and its component parts. [The landscape considered as a measurable finite resource like any other eg minerals, land, water].
<b>Landscape value</b>	the relative value that is attached to different landscapes and LANDMAP aspects. A landscape may be valued by different communities of interest for many different reasons. These can include scenic beauty, tranquillity, wildness, special cultural associations, the presence of conservation interests, rarity or the existence of a consensus about importance, either nationally or locally. Some areas will be designated to express their value. Value is also attributed to each LANDMAP aspect using a variety of criteria. An indication of how an area is valued may also be gained from observation of how it is used- eg a popular path to a hilltop viewpoint.
<b>Magnitude of effect</b>	degree of change
<b>Mixed Farmland</b>	a combination of arable and pastoral farmland
<b>Mosaic</b>	mix of different landcovers at a fine grain such as woodland, pasture and heath.
<b>Objective</b>	method of assessment in which personal feelings and opinions do not influence characterisation or judgements.
<b>Outcrop</b>	the area where a particular rock appears at the surface.

Pastoral	land down to grass either grazed by animals or for cutting.
Physiography	expression of the shape and structure of the land surface as influenced both by the nature of the underlying geology and the effect of geomorphological processes.
Polygon	discrete digitised area in a geographic information system[GIS].
<i>Term</i>	<i>Definition</i>
Prominent	noticeable feature or pattern in the landscape.
Protect	to keep from harm.
Qualities	aesthetic [objective visible patterns]or perceptual [ subjective responses by the seascape/landscape assessor] attributes of the seascape/landscape such as those relating to scale or tranquillity respectively.
Receptor, visual	people in a variety of different situations who can experience views within an area and who may be affected by change or development. Receptors can include users of public footpaths, open access land, roads, rail or cycleways or urban or rural residents.
Receptor, seascape/landscape	seascape/landscape character areas, designations, elements or features which may be affected by development
Remoteness	physical isolation, removal from the presence of people, infrastructure (roads and railways, ferry and shipping routes) and settlement
Resource	see seascape/landscape resource.
Restore	repair or renew.
Riparian	vegetation associated with the water body, usually a river or stream.
Scenic quality	seascape/landscape with scenes of a picturesque quality with aesthetically pleasing elements in composition
Semi-natural vegetation	any type of vegetation that has been influenced by human activities, either directly or indirectly. The term is usually applied to areas which are reverting to nature due to lack of management.
Sense Of Place	the character of a place that makes it locally identifiable or distinctive ie different from other places. Some features or elements can evoke a strong sense of place eg islands, forts, vernacular architecture
Sensory	that which is received through the senses ie sight, hearing, smell, touch.
Setting, of a heritage asset	The surroundings in which the asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or a negative contribution to an asset, may affect the ability to appreciate that significance or may be neutral.
Settlement	all dwellings/habitations, whether single or clustered in cities, towns and villages.
Settlement Pattern	the predominant pattern of settlement in an area.
Significance	In environmental impact assessment- the importance of an effect. A significant effect needs to be taken into account in decision-making.
Subjective	method of assessment in which personal views and reaction are used in the characterisation process.
Topography	term used to describe the geological features of the Earth's surface eg mountains, hills, valleys, plains.

<b>Unity</b>	consistency of pattern over a wide area ie the repetition of similar elements, balance and proportion, scale and enclosure.
<b>Value</b>	see landscape value
<b>Vernacular</b>	built in the local style, from local materials.
<b>Visual Effects</b>	the likely visual effects undergone by people that would result from a development proposal or change in land management.
<i>Term</i>	<i>Definition</i>
<b>Visual sensitivity</b>	visual sensitivity or 'visibility' is a measure of the degree to which change is likely to cause a visual impact within a particular seascape/landscape.

\*Natural England, Scottish Natural Heritage and the Countryside Council for Wales (2011) landscape character assessment guidance (consultation draft).

\*\*AD Hooley (forthcoming?)

## Abbreviations used in text

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CLVIA	Cumulative Landscape and Visual Impact Assessment
CCW	Countryside Council for Wales
EIA	Environmental impact assessment
GLVIA	Guidelines for landscape and visual impact assessment
GIS	Geographic information system
HPMCZ	Highly protected marine conservation zone
HSC	Historic Seascape Characterisation
HW	High water
ICZM	Integrated Coastal Zone Management
Km	kilometres
LBAP	Local Biodiversity Action Plan
LCA	Landscape character assessment <i>or</i> landscape character area
LDP	Local Development Plan
LVIA	Landscape and visual impact assessment
LW	low water
m	metres
MPA	Marine Planning Area
MPS	Marine Policy Statement
nm	nautical miles
NRW	Natural Resources Wales
PCC	Pembrokeshire County Council
PCNP	Pembrokeshire Coast National Park

PCNPA	Pembrokeshire Coast National Park Authority
PSAC	Provisional Special Area of Conservation
PU	Shoreline Management Plan policy unit
RSU	Regional Seascape Unit
RHL	Registered Historic Landscape [Landscapes of outstanding or special historic interest in Wales]
rLCA	Regional Landscape Character Unit
SAM	Scheduled Ancient Monument
SCA	Seascape character assessment / seascape character area
SCT	Seascape character type
SINC	Site of Importance for Nature Conservation
SLA	Special Landscape Area
SMR	Scheduled Monument Record
SPA	Special Protection Area
SPG	Supplementary planning guidance
SSA	Strategic Search Area [for wind energy as defined by TAN8]
SSSI	Site of Special Scientific Interest
SNH	Scottish Natural Heritage
SLVIA	Seascape, landscape and visual impact assessment
WAM	Welsh Activity Mapping

## **8. Appendix H Samples of Site Assessment Worksheets**

Pembrokeshire Seascape Character Area : 40 CARMARTHEN BAY WEST	
Summary of location/limits: MONKSTONE POINT	
Land-based Survey location- GPS (632) 214751/203300	
Photograph nos: 2 356 - 371	
Survey date: 2/3/13 Survey by: SW	
Weather: fine/cloudy/showers/rain/mist-fog Visibility: v.good/good/average/poor Horizon: clear/blurred / none	
Wind/Sea state, Beaufort scale: calm 0/light 1-2/breeze 3-4/breeze 5-6/gale 7-9/ storm + Swell: low/medium/high	
Tide: low/mid/high Rising/ ebbing Spring/ mid-tide Neap	
<b>FEATURES</b>	
Coastal form	Open Bay / Enclosed Bay / Headland / Terrace / Estuary / Spit / Cliff / Stacks / Arches / Dunes / River
Landform	Flat / Undulating / Sloping / Steep / Vertical
Aspect	Predominant, sea from land - N / NE / E / SE / S / SW / W / NW
Land-use	Rough pasture or scrub / Pasture / Arable / Mixed farming / Meadow / Woodland / Forestry Recreational / Parkland / Settlement / Military / Semi natural
Geology visible	Alluvium / Shale / Mudstone / Sandstone / Granite
Sea Water	Clear / Murky / Sediment laden Brown / Grey / Azure blue / Green Blue / Blue / Deep blue
Recreational / built form	Houses / Holiday homes / Caravans-tents / Golf course / Coastal path Farmstead / Hamlet / Village / Town
Inter-tidal zone Visible? Y/N	Broad / Moderate / Narrow Bedrock / Rock-boulders / Shingle / Sand / Mud Boats beached at low tide
Onshore features / landmarks	Harbour / Port / Ferry terminal / Marina / Pier / Sea wall / Slipway / Sea defences / Shelterbelt Power station / Wind turbines / Electricity pylons / Radio masts / Lighthouse / Beacon / Chimney / Gantries / Pipeline / Lifeboat station Road / Rail / Industrial buildings / Container store / Retail park Church spires-towers / Monument or ruin / Topographical feature Tenby
Offshore features/ landmarks	Oil-rigs or Gas-rigs / Wind turbines / Navigational marks or buoys / Fishing buoys / Lighthouse Islands / Rocks / Reefs / Sand-bar N/A
Sea features	Overfall / Eddy / Whirlpool / Evident tidal stream N/A
Navigational features, coastal	Moorings / Anchorage Channel markers / Cardinal marks / Special feature buoys / N/A
Notes	SETTLED COAST INTERSPERSED WITH CLIFFS WITH WETLAND / PLANTATION.
<b>AESTHETIC ASPECTS OF SEASCAPE CHARACTER</b>	
Scale	Intimate / Small / Medium / Large / Vast
Enclosure	Confined / Enclosed / Open / Expansive/Exposed
Diversity	Uniform / Simple / Diverse / Complex
Texture	Smooth / Textured / Rough / (Very rough)
Form	Straight / Angular / Curved / Sinuous
Line	Vertical / Sloping / Rolling
Colour	Monochrome / Muted / Colourful / Garish / Moderate contrasts / Strong contrasts GRASS + WHITE SETTLEMENTS
Pattern	Random / Organised / Regular / Formal
Unity	Unified / Interrupted / Fragmented / Disunity
Visual Dynamic	Panoramic / Framed / Intermittent / Channelled
Balance	Harmonious / Balanced / Discordant / Chaotic
Movement	Still / Calm / Restful-rhythmic / Busy
Notes incl attractors and detractors	WHITE REMODELLED BUILDINGS IN SETTLEMENTS + CARAVANS - DETRACTORS, ESPECIALLY ON CLIFF TOPS.

PERCEPTUAL AND EXPERIENTIAL ASPECTS OF SEASCAPE CHARACTER	
Exposure	Very exposed / <u>Exposed</u> / Mixed / Sheltered / Very sheltered
Proportion sea to sky at viewpoint	Sea dominates / <u>Balanced</u> / Land dominates
Focus	Objects or landform fill the view / <u>Balanced</u> / Objects or landform are less strong
Security	<u>Safe</u> / Unsettling / Disturbing / Threatening
Stimulus	Monotonous / Non-descript / <u>Interesting</u> / Challenging / Inspiring
Tranquillity	Still-tranquil / <u>Some tranquillity</u> / Limited tranquillity / Busy
Remoteness	Remote / Some man-made features-few people / <u>Settled rural-some people</u> / Settled/urban /crowded
Views	<u>Panoramic</u> / Channelled / Narrow / Filtered
Naturalness	Natural / Tamed / <u>Managed</u> / Artificial / Manmade
Noise	<u>Quiet</u> / Distant / Intermittent / Loud
Smell	<u>Natural / Salty</u> / Seaweed / Fisheries / Agricultural / Industry / Fumes
Sense of place	<u>Strong</u> ..... Moderate ..... Weak
Notes including key views	KEY VIEWS TO TENBY + ACCESS TO GOWER + CALDEY ISLAND SOME TRANQUILLITY BETWEEN SETTLEMENTS
ACTIVITIES	
Coastal	General beach activity / Leisure sailing / Canoeing / Windsurfing / Power boating / Shore angling / Walking / Kite surfing / Sand sailing/fisheries/commercial/port/harbour
Marine	Fish farming / Mussel rafts / Commercial fishing / <u>Shipping lane</u> / Ferry route/renewable energy <u>Sailing</u> / Canoeing-surfboarding / Power craft / Recreational fishing 2 SETS OF DINGHIES OUT OF TENBY.
Cultural associations	Historical event / Artistic / Literature / Culinary / Musical / Festivals ?
Notes	WINTER - REDUCED USE
DYNAMICS	
Dynamics- forces for change	Fishing industry / <u>Tourism</u> / Erosion / <u>Development: residential</u> / industrial-retail / Road or rail / Parking
	DEVELOPMENT PRESSURE ON COAST APPARENT
CONDITION	
Rarity	Single example / <u>Infrequent</u> / Frequent / Common
Intactness	Complete ..... <u>+</u> ..... Remnant
Condition	Excellent / Good / <u>Declining</u> / Poor / Derelict
Fragility	Robust ..... <u>+</u> ..... Delicate
Capacity for change	VERY LIMITED CAPACITY IN UNDEVELOPED STRETCHES OF COAST.
Notes	



<b>Pembrokeshire Seascape Character Area no.:26 name: Skokholm and Gateholm coastal waters</b>	
<b>Sea-based Survey location / GPS / grid ref:</b> 175550/206450 <b>Distance from coast:</b> 1.5km from nearest land and islands <b>Photo numbers:</b> K..	
<b>Survey date:</b> 12.2.13 <b>Survey by:</b> SM	
<b>Weather:</b> fine/cloudy/showers/rain/mist-fog <b>Visibility:</b> v.good/good/average/poor <b>Horizon:</b> clear/ blurred / none <b>Wind/Sea state, Beaufort scale:</b> calm 0/light 1-2/breeze 3-4/breeze 5-6/gale7-9/ storm + <b>Swell:</b> low/medium/high <b>Tide:</b> low/mid/high Rising / ebbing Spring / mid-tide / Neap	
<b>FEATURES</b>	
<b>Coastal form</b>	Low / Medium / High / Cliffs/ Variable Linear / Bay / Convex / Indented / Estuary / Other...island
<b>Coastal landform</b>	Flat / Undulating / Sloping / Steep / Vertical
<b>Aspect</b>	Predominant, land from sea -N / NE / E / SE / S / SW/ W / NW
<b>Sea Water</b>	Clear / Murky / Sediment laden Brown / Grey / Azure blue / Green Blue / Blue / Deep blue
<b>Built form</b>	No or little evident development / Small settlements / Large settlements
<b>Onshore features / landmarks</b>	Harbour / Port / Ferry terminal / Marina / Pier / Sea wall / Slipway / Sea defences / Rocks / Shelterbelt Power station/ Wind turbines / Electricity pylons / Radio masts / Lighthouse / Beacon / Chimney / Gantries / Pipeline / Lifeboat station Road / Rail / Industrial buildings / Container store / Retail park Church spires- towers / Monument or ruin / Topographical feature / Other...
<b>Offshore features/ landmarks</b>	Oil rigs or Gas rigs / Wind turbines / Navigational marks or buoys / Fishing buoys / Lighthouse Islands / Rocks / Reefs / Sand-bar Other...
<b>Sea features</b>	Overfall / Eddy / Whirlpool / Evident tidal stream
<b>Navigational features, coastal</b>	Moorings / Anchorage Channel markers / Cardinal marks / Special feature buoys / Other...
<b>Notes</b>	Land features evident at this distance Rocky shoreline and naturalness of sea edge just evident Some disturbed water, especially in Jack Sound St Ann's Lighthouse not really visible to naked eye in far distance, approx 6km
<b>ACTIVITIES</b>	
<b>Marine activity</b>	Fish farming / Mussel rafts / Commercial fishing / Shipping lane/ Ferry route Sailing / Canoeing- surfboarding / Power craft / Recreational fishing Other...
<b>Coastal activity</b>	Settlement / Development / Caravans / Chalets / Camping / Port / Harbour / Marina / Beach activity / Other...
<b>Cultural associations</b>	Historical event / Artistic/ Literature / Culinary / Musical / Festivals
<b>Notes</b>	None evident
<b>DYNAMICS or evident forces for change</b>	
<b>Apparent dynamics</b>	Fishing industry / Leisure activity / Commercial marine / Coastal processes / Coastal development Other...
<b>Notes</b>	Widespread/ localised / limited? None evident



<b>AESTHETIC ASPECTS OF SEASCAPE CHARACTER</b>	
<b>Scale</b>	Intimate / Small / Medium / Large / Vast
<b>Enclosure</b>	Confined / Enclosed / Open / Expansive/Exposed
<b>Diversity</b>	Uniform / Simple / Diverse / Complex
<b>Movement</b>	Still / Calm / Restful-rhythmic / Busy
<b>Colour</b>	Monochrome / Muted/ Colourful / Garish / Moderate contrasts / Strong contrasts
<b>Notes</b> incl attractors and detractors	Colours and shapes only visible at this distance and in poor to average visibility
<b>PERCEPTUAL AND EXPERIENTIAL ASPECTS OF SEASCAPE CHARACTER</b>	
<b>Exposure</b>	Very exposed / Exposed / Mixed / Sheltered / Very sheltered
<b>Proportion</b> sea to sky at viewpoint	Land not visible / Sea dominates / Land distant / Balanced / Land noticeable / Land dominates
<b>Focus</b>	Objects or landform fill the view / Balanced / Objects or landform are less strong
<b>Security</b>	Safe / Unsettling / Disturbing/ Threatening
<b>Stimulus</b>	Monotonous -Non-descript / Interesting / Challenging / Inspiring due to navigation through Jack Sound
<b>Tranquillity</b>	Still-tranquil / Some tranquillity / Limited tranquillity / Busy
<b>Remoteness</b>	Remote / Some evidence of man-made features / Man made features are strong
<b>Views</b>	Panoramic / Channelled / Narrow / Filtered views vary but generally contained by islands and mainland
<b>Naturalness</b>	Natural / Tamed / Managed / Artificial / Manmade
<b>Noise</b>	Quiet / Distant / Intermittent / Loud none
<b>Smell</b>	Natural / Salty / Seaweed / Fisheries / Agricultural / Industry / Fumes
<b>Sense of place</b>	Weak.....**...Strong
<b>Notes</b>	Islands and sounds give strong sense of place and interest and orientation Excitement of navigational hazards
<b>QUALITY</b>	
<b>Rarity</b>	Single example / Infrequent / Frequent / Common due to islands
<b>Intactness</b>	Complete -**-----Remnant
<b>Condition</b>	Maintained -----Abandoned
<b>Fragility</b>	Robust -**-----Delicate
<b>Notes</b>	

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The study team consisted of:

- Simon White (White Consultants)- lead consultant, coordination, main author, seascape assessment
- Simon Michaels (White Consultants)- seascape assessment
- Lesley Cherns (Cardiff University)- geomorphology/coastal processes interpretation
- David Gwyn (Govannon) and Richard Kelly- cultural heritage interpretation
- David Reed (Mariteam Associates)- marine and coastal tourism and uses and local knowledge
- Alun Rogers (Cardiff University)- GIS and mapping

All photos are by White Consultants unless otherwise stated.