



COMPARATIVE BEACH AESTHETICS: THE SOUTH WEST COASTS OF ENGLAND AND WALES, UK

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Presentation

- Rationale
- Location of Study
- Physical Background
- Methodology
- Results
- Conclusions

Rationale

- **“..... countries are characterised by a valuable cultural, historical and landscape heritage” (Benoit and Comeau, 2005)**
- **“Many natural landscapes are becoming cultural landscapes and consequences of these changes has led to environmental degradation and necessitated intervention” (Wascher, 2001)**

Landscape Ecology

Three main areas:

- **Determination of pattern in landscapes and of the resources and forces which determine it, both natural and anthropogenic;**
- **Response of species, including humans, to this pattern, both in movement and population dynamics;**
- **Nature of flows between the components of the landscape pattern.**

(Green, 1996)

Threatened Valued Landscapes

Based on both objective and value judgements:

- **Is there a threat or likelihood of a threat;**
- **Is the landscape worth conserving and why.**

Analysis:

- **Social (perception and culture)**
- **Environmental (ecological)**
- **Economic (sustainable)**

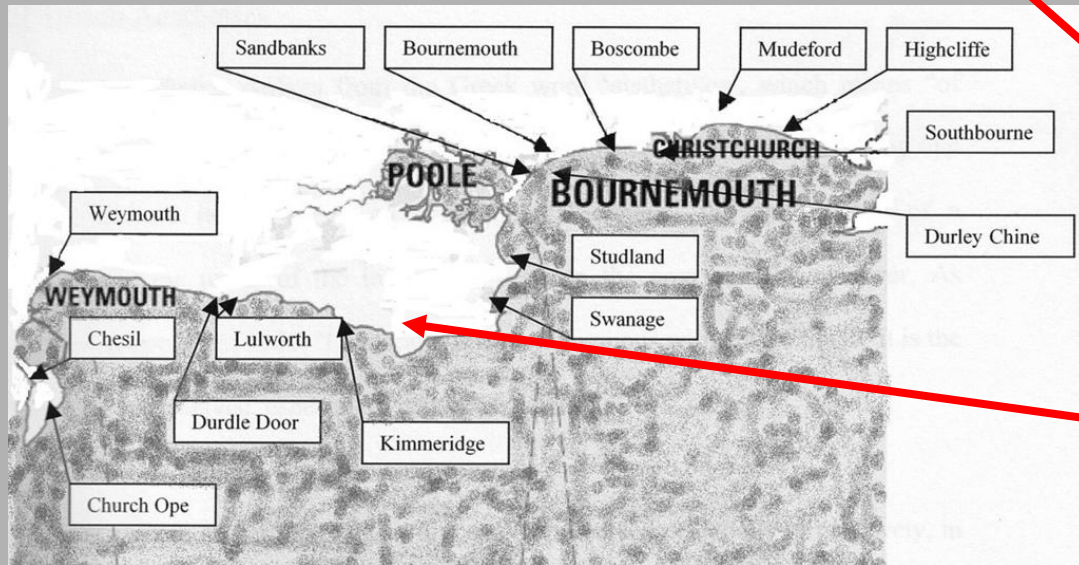
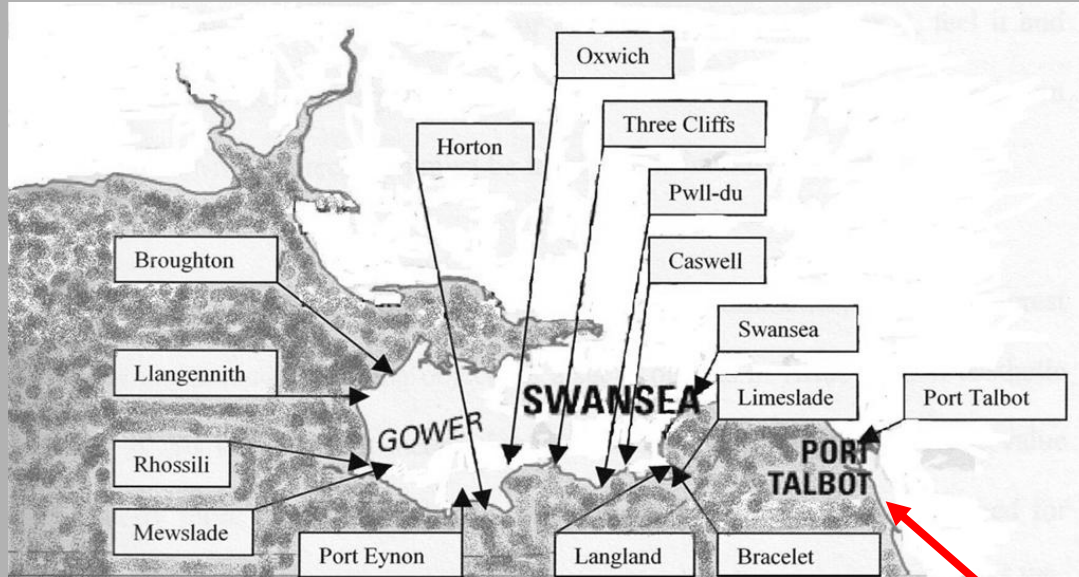
(Bruns and Green, 2001)

Landscape Protection compared with Nature Conservation

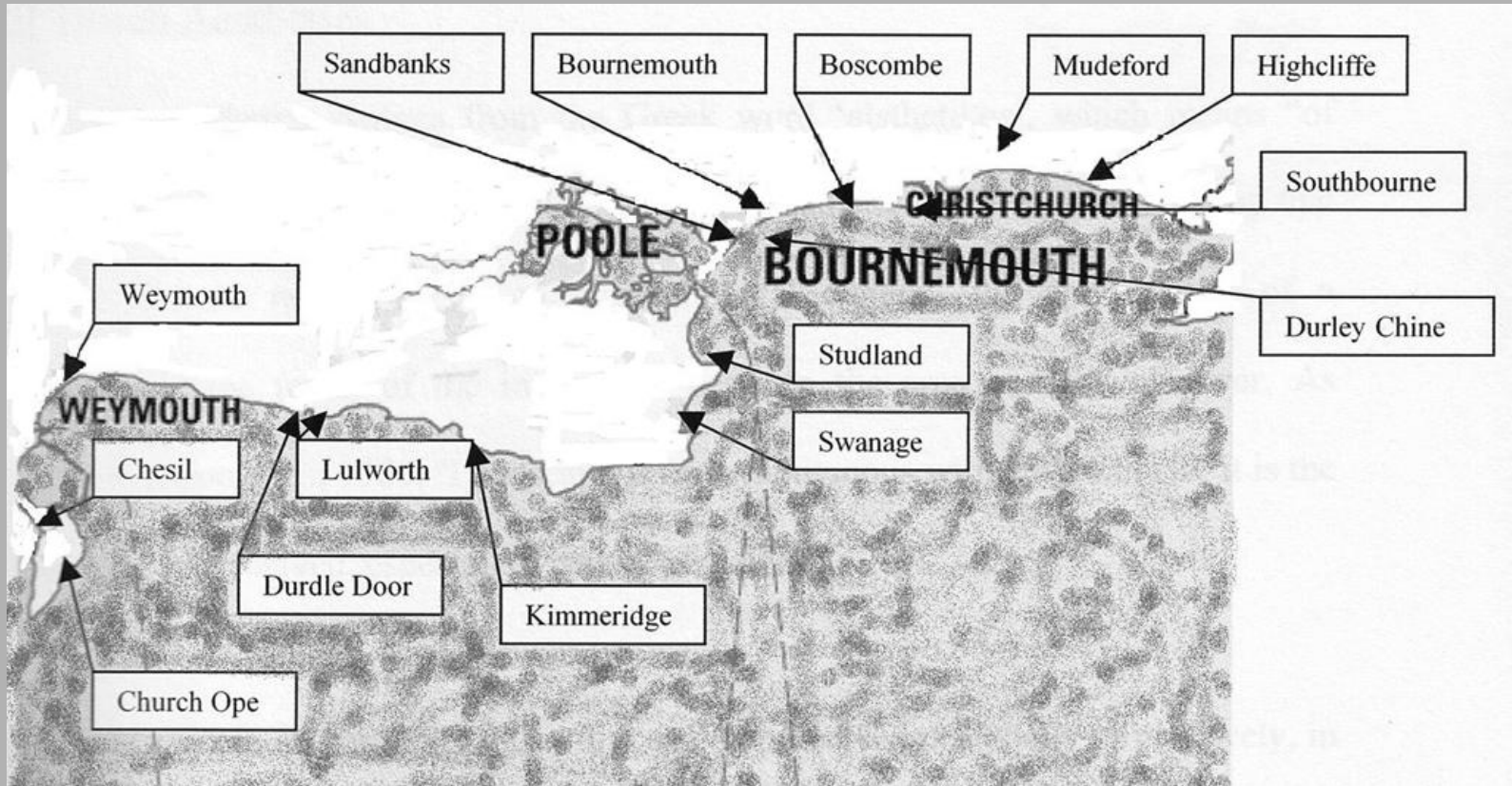
Bio-Geographic Region	Nature Conservation (%) TSA	Landscape Conservation (%) TSA
Mediterranean	0.8	4.0
Alpine	4.1	16.6
Central-East Europe	1.8	8.7
North-West Europe	2.6	14.0
Scandinavia	4.4	2.6

(Wascher, 2001)

Location



Physical Background



South-West England



Boscombe ^{EM}



Bournemouth ^{EM}



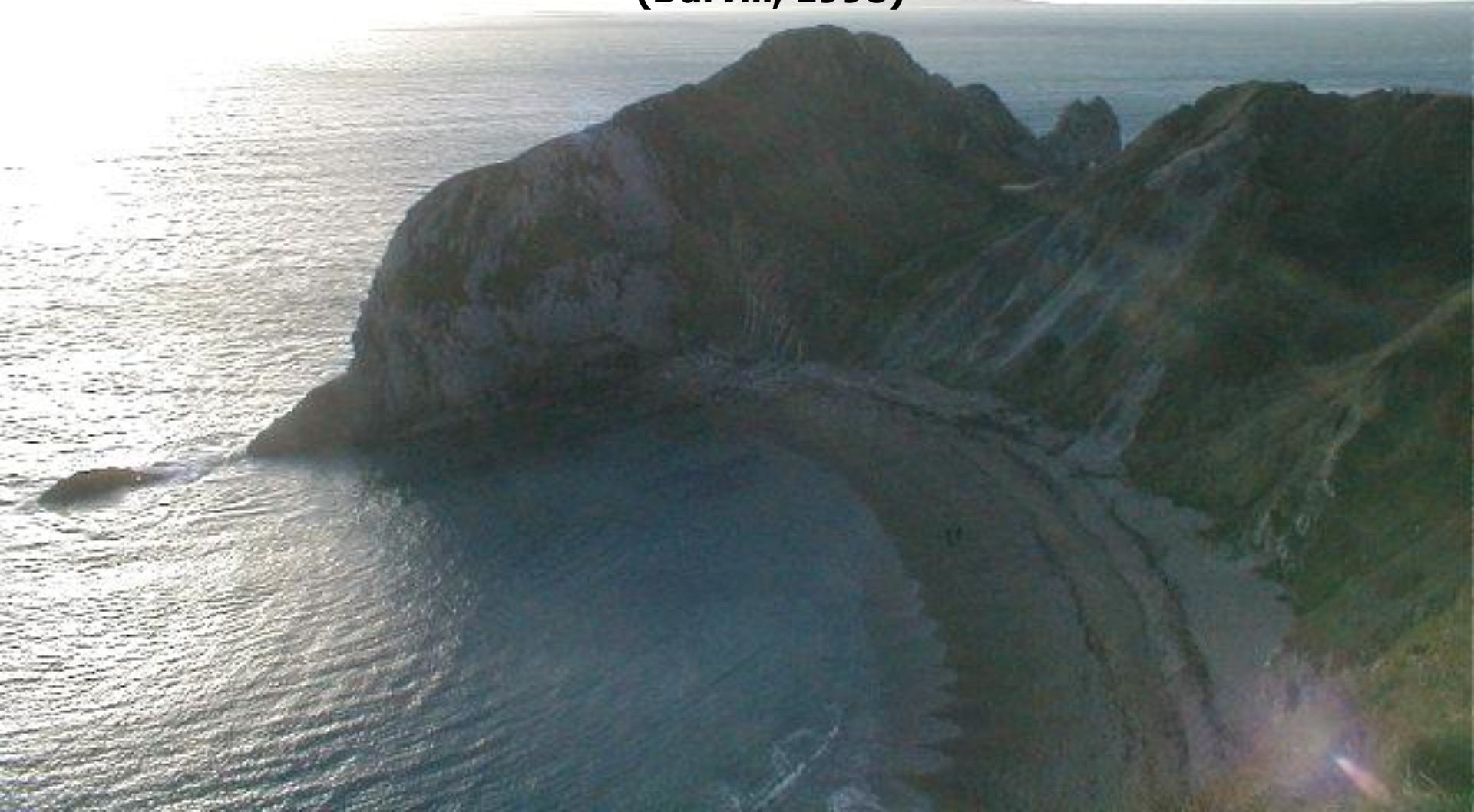
Church Ope ^{MAONB}



Chesil Beach ^{SSSI SAC AONB}

Durdle Door MCS AONB

**"Landscapes do not have edges, they are seamless webs which extend out in all directions, constrained only by the conceptual horizons of the people for whom such spaces mean something".
(Darvill, 1998)**





Durley Chine ^{E M}



Highcliffe ^{M SSSI}



Kimmeridge Bay ^{M AONB}



Mudeford ^M

Lulworth Cove ^M AONB

'see it, hear it, feel it and perhaps even taste it...the experience of the environmental object of appreciation from which aesthetic appreciation must be fashioned, is initially intimate...' (Light and Rolston III, 2003)





Sandbanks ^{E M B}



Southbourne ^{E M B}



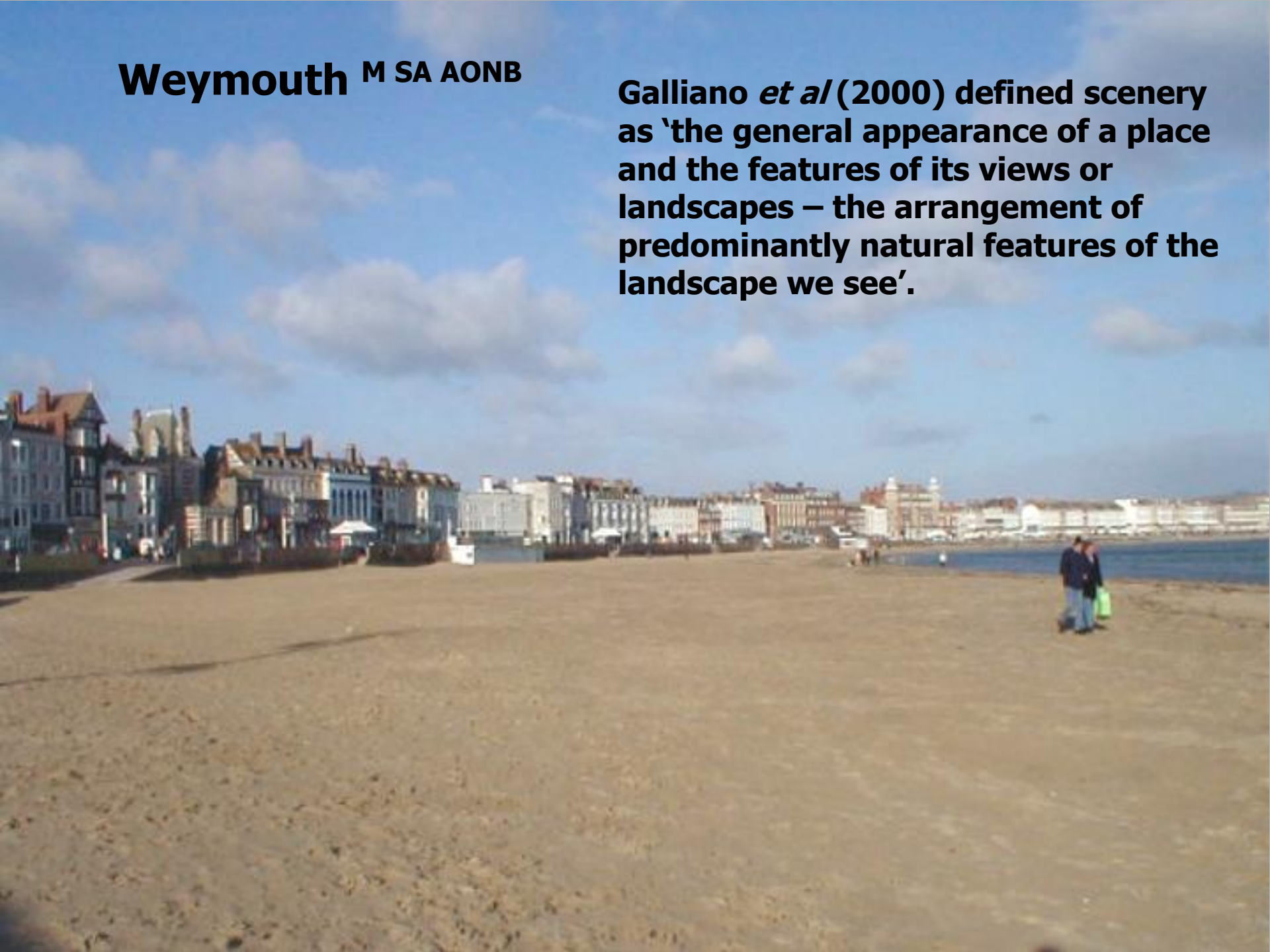
Studland ^{M AONB}

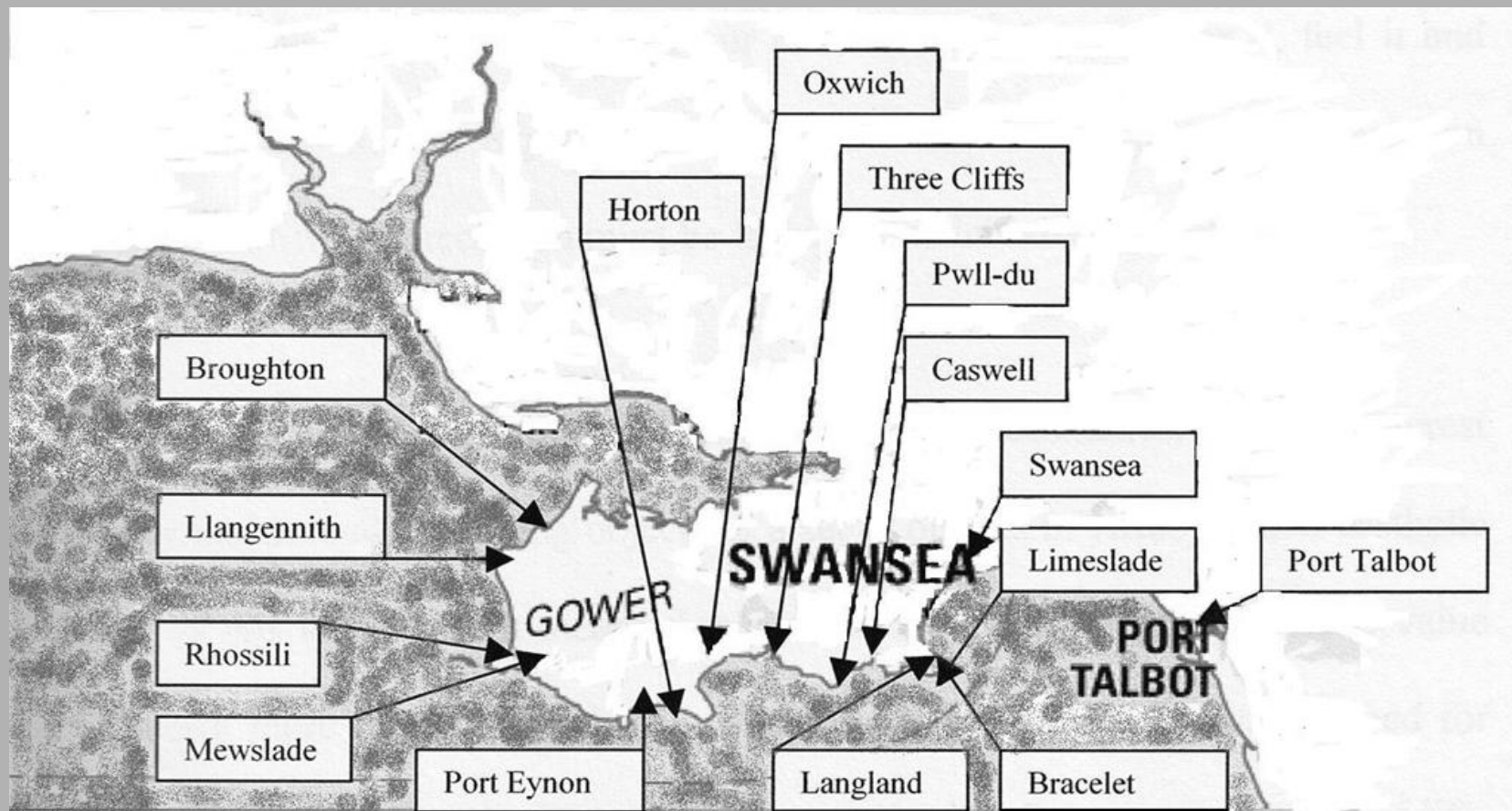


Swanage ^{E M SA}

Weymouth M SA AONB

Galliano *et al* (2000) defined scenery as 'the general appearance of a place and the features of its views or landscapes – the arrangement of predominantly natural features of the landscape we see'.





South-West Wales



Bracelet Bay M SA B
HC



Broughton Bay M SSSI AONB



Caswell M AONB B HC



Horton M AONB HC

Rhossili Bay M AONB HC

**“The coastal zone is more than just a narrow strip of land and sea coveted for development. Its ecosystems, with great natural value, and the importance of its social functions and cultural heritage make it a precious resource”.
(Benoit and Comeau, 2005)**





Langland Bay ^{M SA B}



Limeslade Bay ^{M SA}



Llangennith ^{M AONB HC}



Mewslade Bay ^{M AONB HC}

Pwll-Du Bay AONB HC

"The aesthetic 'perception' of natural processes has the potential to make 'the good life' better". (Gajendar, 2004)





Oxwich Bay ^M AONB HC



Port Eynon ^M SA AONB HC B



Port Talbot (Aberavon) ^M



Swansea

Three Cliffs Bay ^{M AONB HC}

**'Studies have shown that the public tend to have common perceptions of what constitutes natural scenic beauty' and that 'landscape settings with high degrees of natural-appearing character are most desirable'.
(Galliano & Loeffler, 2000)**



METHODOLOGY

The methodology used is based on scoring scenic parameters

- Physical Parameters

- **Cliff**
 - Height
 - Slope
 - Special Features
- **Beach**
 - Material
 - Width
 - Colour
- **Rocky Shore**
 - Slope
 - Extent
 - Roughness
- **Dunes**
- **Valley**
- **Landform**
- **Tides**
- **Coastal Landscape Features**
- **Vistas**

- Human Parameters

- **Disturbance Factor**
- **Litter**
- **sewage**
- **Non-built environment**
- **Built environment**
- **Access type**
- **Skyline**
- **Utilities**
- **Water colour**
- **Natural vegetation**
- **Vegetation debris**

Coastal Scenic Assessment System – Physical Parameters

Site Name:												
No:	Physical Parameters		RATING									
			1		2		3		4		5	
1	CLIFF	Height	Absent		>5m - <30m		30m - <60m		60m - 90m		>90m	
2		Slope	Absent		Around 45 °		Around 60 °		Around 75 °		Circa Vertical	
3		Special Features	Absent		1		2		3		Many >3	
4	BEACH FACE	Type	Absent		Mud		Cobble / Boulder		Pebble / Gravel (±Sand)		Sand	
5		Width	Absent		<5m - >100m		5m - <25m		25m - <50m		50m-100m	
6		Colour	Absent		Dark		Dark Tan		Light Tan / Bleached		White/G old	
7	ROCKY SHORE	Slope	Absent		<5 °		5 °-10 °		10 °-20 °		20 °-45 °	
8		Extent	Absent		<5m		5m- <10m		10m- <20m		>20m	
9		Roughness	Absent		Distinctly Jagged		Deeply Pitted and/or Irregular (uneven)		Shallow Pitted		Smooth	
10	DUNES		Absent		Remnants		Fore-dune		Secondary Ridge		Several	
11	VALLEY		Absent		Dry Valley		(<1m) Stream		(1m-4m) Stream		River/ Limestone gorge	
12	SKYLINE LANDFORM		Not Visible		Flat		Undulating		Highly Undulating		Mountainous	
13	TIDES		Macro (>4m)				Meso (2m-4m)				Micro (<2m)	
14	COASTAL		None		1		2		3		>3	
15	VISTAS		Open on one side		Open on two sides				Open on three sides		Open on four sides	
16	WATER COLOUR & CLARITY		Muddy Brown / Grey		Milky Blue / Green; Opaque		Green / Grey Blue		Clear Blue / Dark blue		Very Clear Turquoise	
17	NATURAL VEGETATION COVER		Bare (<10% vegetation only)		Scrub / Garigue (marram/ gorse, bramble, etc)		Wetlands / Meadow		Coppices , Maquis (±Mature Trees)		Variety of Mature Trees / Mature Natural Cover	
18	VEGETATION DEBRIS		Continuous >50cm high		Full Strand Line		Single Accumulation		Few Scattered Items		None	

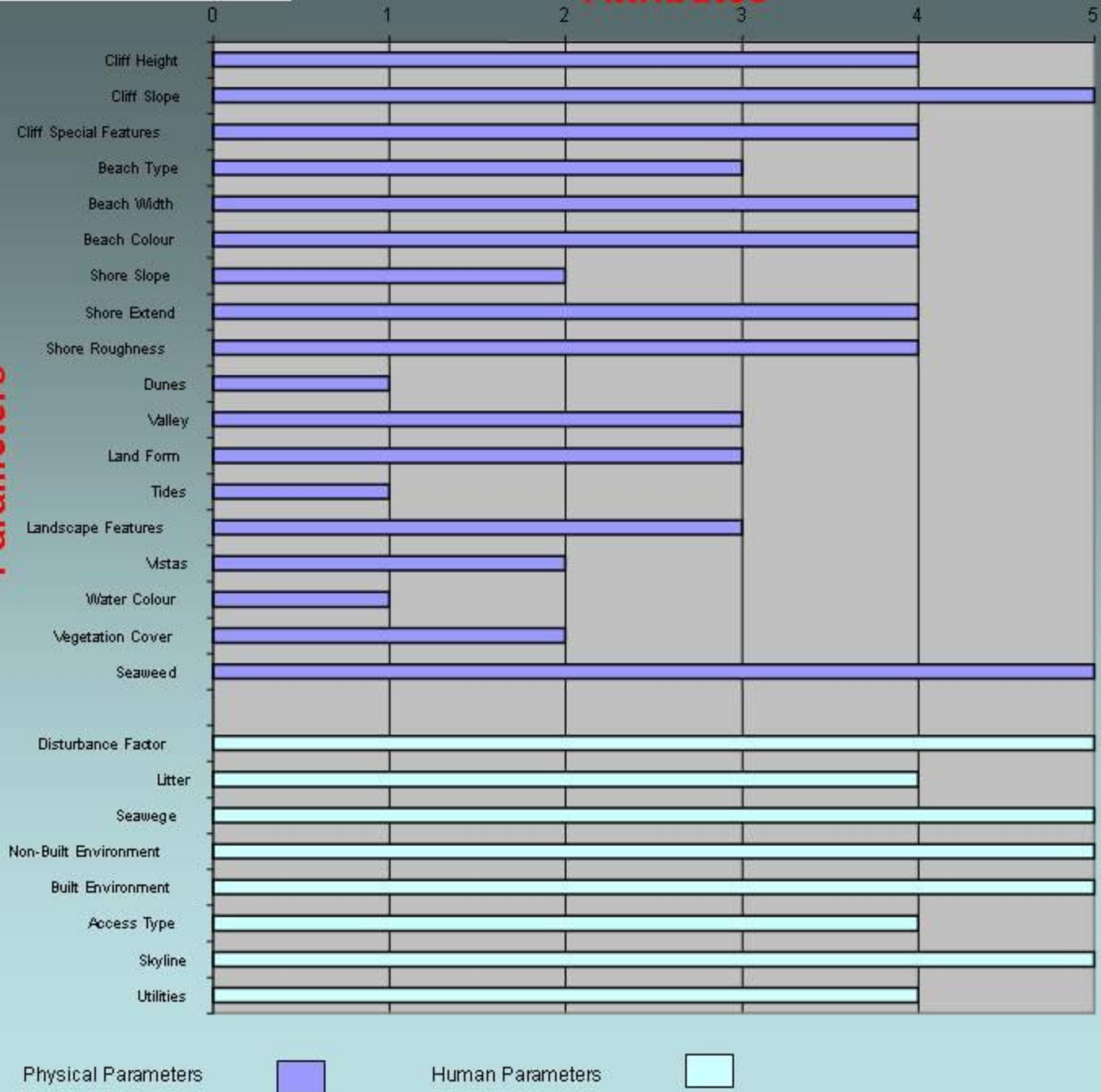
Coastal Scenic Assessment System – Human Parameters

	Human	1		2		3		4		5	
19	NOISE DISTURBANCE	Intolerable		Tolerable				Little		None	
20	LITTER	Continuous Accumulations		Full Strand Line		Single Accumulation		Few Scattered Items		Virtually Absent	
21	SEWAGE DISCHARGE EVIDENCE	Sewage Evidence				Some Evidence (1-3 items)				No Evidence of Sewage	
22	NON-BUILT ENVIRONMENT	None				Hedgerow / Terracing / Monoculture				Field Mixed Cultivation ± Trees / Natural	
23	BUILT ENVIRONMENT	Heavy Industry		Heavy Tourism and/or Urban		Light Tourism and/or Urban and/or Sensitive Industry		Sensitive Tourism and/or Urban		Historic and/or None	
24	ACCESS TYPE	No Buffer Zone / Heavy Traffic		No Buffer Zone / Light Traffic				Parking Lot Visible From Coastal Area		Parking Lot Not Visible From Coastal Area	
25	SKYLINE	Very Unattractive		Unattractive		Sensitively Designed High / Low		Very Sensitive Designed		Natural / Historic Features	
26	UTILITIES	>3		3		2		1		None	

Assessment Histogram

Attributes

Parameters



FreshWater West, UK

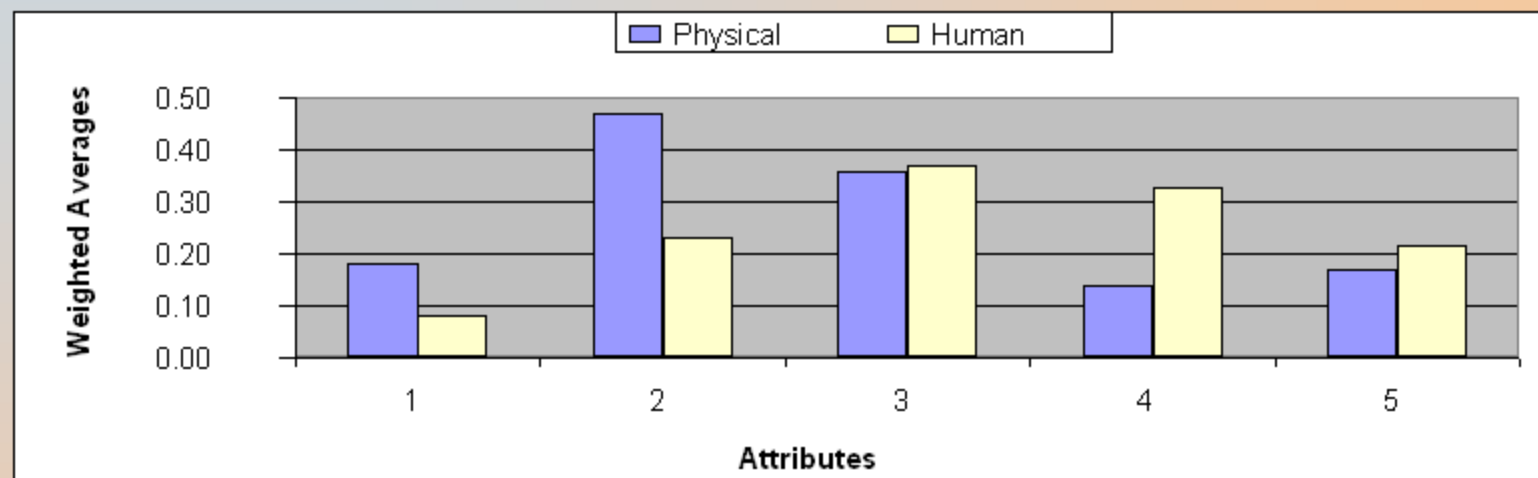
Assessment Matrices

No;	Assessment Parameters		Graded Attributes	Weights Of Parameters	Input Matrices d		Fuzzy Assessment Matrices															
							A	Grade Matrices G					Matrices	Fuzzy Weighted Assessment Matrix R _m								
	Attributes (1-5)							Attributes (1-5)														
	1	2						3	4	5	1	2		3	4	5						
1	Cliff Height	(1-1)	3	0.02	0	0	1	0	0	A _p	0.00	0.30	1.00	0.30	0.00	R _p	0.000	0.006	0.019	0.006	0.000	
2	Cliff Slope	(1-2)	4	0.02	0	0	0	1	0		0.00	0.00	0.50	1.00	0.50		0.000	0.000	0.009	0.017	0.009	
3	Special Features	(1-3)	4	0.03	0	0	0	1	0		0.00	0.00	0.00	1.00	0.30		0.000	0.000	0.000	0.028	0.008	
4	Beach Type	(2-1)	5	0.03	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.034	
5	Beach Width	(2-2)	5	0.03	0	0	0	0	1		0.00	0.00	0.00	0.60	1.00		0.000	0.000	0.000	0.017	0.029	
6	Beach Color	(2-3)	4	0.02	0	0	0	1	0		0.00	0.00	0.20	1.00	0.00		0.000	0.000	0.005	0.024	0.000	
7	Shore Slope	(3-1)	2	0.01	0	1	0	0	0		0.00	1.00	0.10	0.00	0.00		0.000	0.014	0.001	0.000	0.000	
8	Shore Extent	(3-2)	5	0.01	0	0	0	0	1		0.00	0.00	0.00	0.40	1.00		0.000	0.000	0.000	0.006	0.015	
9	Shore roughness	(3-3)	3	0.02	0	0	1	0	0		0.00	0.10	1.00	0.30	0.00		0.000	0.002	0.022	0.007	0.000	
10	Dunes	(4)	5	0.04	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.039	
11	Valley	(5)	2	0.08	0	1	0	0	0	A _b	0.00	1.00	0.00	0.00	0.00	R _b	0.000	0.079	0.000	0.000	0.000	
12	Landform	(6)	2	0.08	0	1	0	0	0		0.00	1.00	0.30	0.00	0.00		0.000	0.085	0.025	0.000	0.000	
13	Tides	(7)	1	0.04	1	0	0	0	0		1.00	0.00	0.00	0.00	0.00		0.036	0.000	0.000	0.000	0.000	
14	Landscape Features	(8)	3	0.12	0	0	1	0	0		0.00	0.00	1.00	0.20	0.00		0.000	0.000	0.121	0.024	0.000	
15	Vistas	(9)	4	0.09	0	0	0	1	0		0.00	0.00	0.00	1.00	0.30		0.000	0.000	0.000	0.095	0.029	
16	Water Color	(1)	3	0.14	0	0	1	0	0		0.00	0.20	1.00	0.30	0.00		0.000	0.028	0.140	0.042	0.000	
17	Vegetation Cover	(2)	2	0.12	0	1	0	0	0		0.50	1.00	0.50	0.10	0.00		0.059	0.117	0.059	0.012	0.000	
18	Seaweed	(3)	4	0.09	0	0	0	1	0		0.00	0.00	0.20	1.00	0.00		0.000	0.000	0.017	0.086	0.000	
	FUZZY WEIGHTED AVERAGES MATRIX FOR SUBSET PHYSICAL V																0.094	0.331	0.418	0.364	0.161	
	Human																					
20	Disturbance Factor (1)		2	0.14	0	1	0	0	0	A _H	0.20	1.00	0.00	0.20	0.00	R _H	0.027	0.137	0.000	0.027	0.000	
21	Litter (2)		4	0.15	0	0	0	1	0		0.00	0.00	0.20	1.00	0.10		0.000	0.000	0.030	0.149	0.015	
22	Sewage (3)		5	0.15	0	0	0	0	1		0.00	0.00	0.10	0.00	1.00		0.000	0.000	0.015	0.000	0.149	
23	Non-built Environment (4)		5	0.06	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.064	
24	Built Environment (5)		5	0.14	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.137	
25	Access Type (6)		4	0.09	0	0	0	1	0		0.00	0.00	0.30	1.00	0.00		0.000	0.000	0.027	0.091	0.000	
26	Skyline (7)		5	0.14	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.137	
27	Utilities (8)		5	0.14	0	0	0	0	1		0.00	0.00	0.00	0.00	1.00		0.000	0.000	0.000	0.000	0.137	
	FUZZY WEIGHTED AVERAGES MATRIX FOR SUBSET HUMAN V															0.027	0.137	0.072	0.268	0.637		
Fuzzy Weighted Averages Matrix																						
Elements of FuzzyWeighted Awerages Matrix										Weights Of Subsets W _F		Matrix K		Attributes (1-5)								
														1	2	3	4	5				
Fuzzy Weighted Awerages Matrix of Subset Physical V										1/2				0.094	0.331	0.418	0.364	0.161				
Fuzzy Weighted Awerages Matrix of Subset Human V										1/2		0.027	0.137	0.072	0.268	0.637						
Final Fuzzy Assessment Matix (W _F × K)																						
Final Assessment Matrix (R)															0.061	0.234	0.245	0.316	0.399			

Attributes, Weighted Averages, Membership Degree

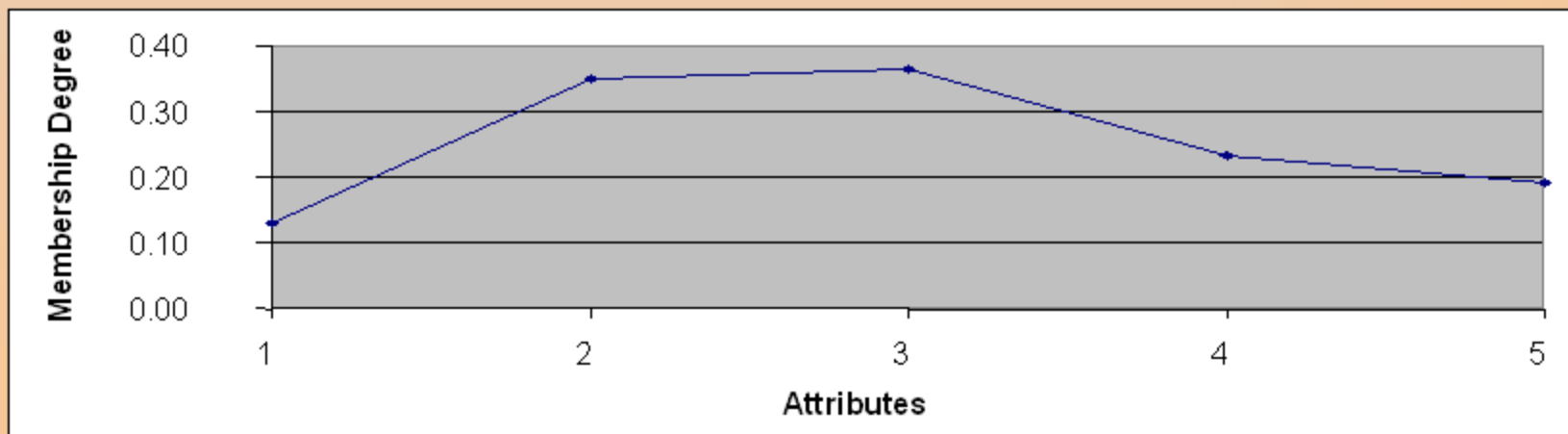
Interpretation on Weighted Averages Of Attributes

Weighted Cumulative of All Attributes				Weighted Cumulative (WCU) of Attributes 4-5 (A)				Weighted Cumulative (WCU) of Attributes 1-2 (B)				Ratio WCU of Attributes 4-5 to WCU of Attributes 1-2			
Physical		Human		Physical		Human		Physical		Human		Physical		Human	
Value	Ratio	Value	Ratio	Value	Ratio	Value	Ratio	Value	Ratio	Value	Ratio	Value	Ratio	Value	Ratio
3.59	0.50	3.57	0.50	1.40	0.37	2.38	0.63	1.12	0.68	0.54	0.32	1.25	0.55	4.43	1.94



Interpretation on Membership Degrees

Areas Below the Curve For All Attributes								Attribute = 3 (3-5)	Attribute = 3 (1-3)		$A_{10} - A_{10}$	$(A_{10} - A_{10}) / A_{10}$	$\frac{[(-2 \times A_{10}) + (-1 \times A_{10}) + (1 \times A_{10}) + (2 \times A_{10})] / A_{10}}{A_{10}}$		
1-2	2-3	3-4	4-5	A_{10}					A_{10}	A_{10}					
0.24	A_{10} / A_{10}	A_{10} / A_{10}	A_{10} / A_{10}	A_{10} / A_{10}	A_{10} / A_{10}	A_{10} / A_{10}	A_{10} / A_{10}	1.11	0.51	0.46	0.60	0.54	0.86	-0.08	-0.10



Computation Techniques for Interpretation of the Scenic Assessment Data

Computations carried out on the data were based on the membership degrees vs. attributes graphs.

D1) According to $\frac{A_{35}}{A_T}$ values. The higher the better.

D2) According to $\frac{A_{35}}{A_{13}}$ values. The higher the better

D3) According to $\frac{A_{35} - A_{13}}{A_T}$ values. The higher the better

D4) According to higher the $\frac{(-2 \times A_{12}) + (-1 \times A_{23}) + (1 \times A_{34}) + (2 \times A_{45})}{A_T}$ values. The better

Classification of Coastal Sites:

CLASS 1 ;

Extremely attractive natural site with very high landscape value. $D > 0.85$.

CLASS 2 ;

Attractive natural site with high landscape value.
 D between 0.85 and 0.65

CLASS 3 ;

Mainly natural with little outstanding landscape features. D between 0.65 and 0.4

CLASS 4 ;

Mainly unattractive urban with low landscape values.
 D value between 0 and 0.4

CLASS 5 ;

Very unattractive urban, intensive development and low landscape values. D value < 0 .

Results

SITE	D Value	Class
<i>Studland</i>	<i>0.87</i>	<i>1</i>
<i>Mewslade</i>	<i>0.85</i>	<i>1</i>
Kimmeridge	0.76	2
<i>Durdle Door</i>	<i>0.74</i>	<i>2</i>
<i>Broughton</i>	<i>0.71</i>	<i>2</i>
Llangennith	0.64	3
<i>Lulworth</i>	<i>0.63</i>	<i>3</i>
<i>Three Cliffs</i>	<i>0.60</i>	<i>3</i>
<i>Rhossili</i>	<i>0.54</i>	<i>3</i>
<i>Pwll-du</i>	<i>0.53</i>	<i>3</i>
<i>Port Eynon</i>	<i>0.42</i>	<i>3</i>
Chesil	0.38	4
<i>Church Ope</i>	<i>0.31</i>	<i>4</i>
<i>Horton</i>	<i>0.30</i>	<i>4</i>
<i>Highcliffe</i>	<i>0.25</i>	<i>4</i>
<i>Oxwich</i>	<i>0.24</i>	<i>4</i>

<i>Bracelet</i>	<i>0.22</i>	<i>4</i>
<i>Durley Chine</i>	<i>0.22</i>	<i>4</i>
<i>Swanage</i>	<i>0.20</i>	<i>4</i>
<i>Limeslade</i>	<i>0.12</i>	<i>4</i>
<i>Sandbanks</i>	<i>0.12</i>	<i>4</i>
<i>Caswell</i>	<i>0.11</i>	<i>4</i>
<i>Southbourne</i>	<i>0.11</i>	<i>4</i>
<i>Langland</i>	<i>-0.01</i>	<i>5</i>
Aberavon	-0.11	5
<i>Boscombe</i>	<i>-0.15</i>	<i>5</i>
<i>Mudford</i>	<i>-0.18</i>	<i>5</i>
<i>Weymouth</i>	<i>-0.21</i>	<i>5</i>
Bournemouth	-0.28	5
Swansea	-0.31	5

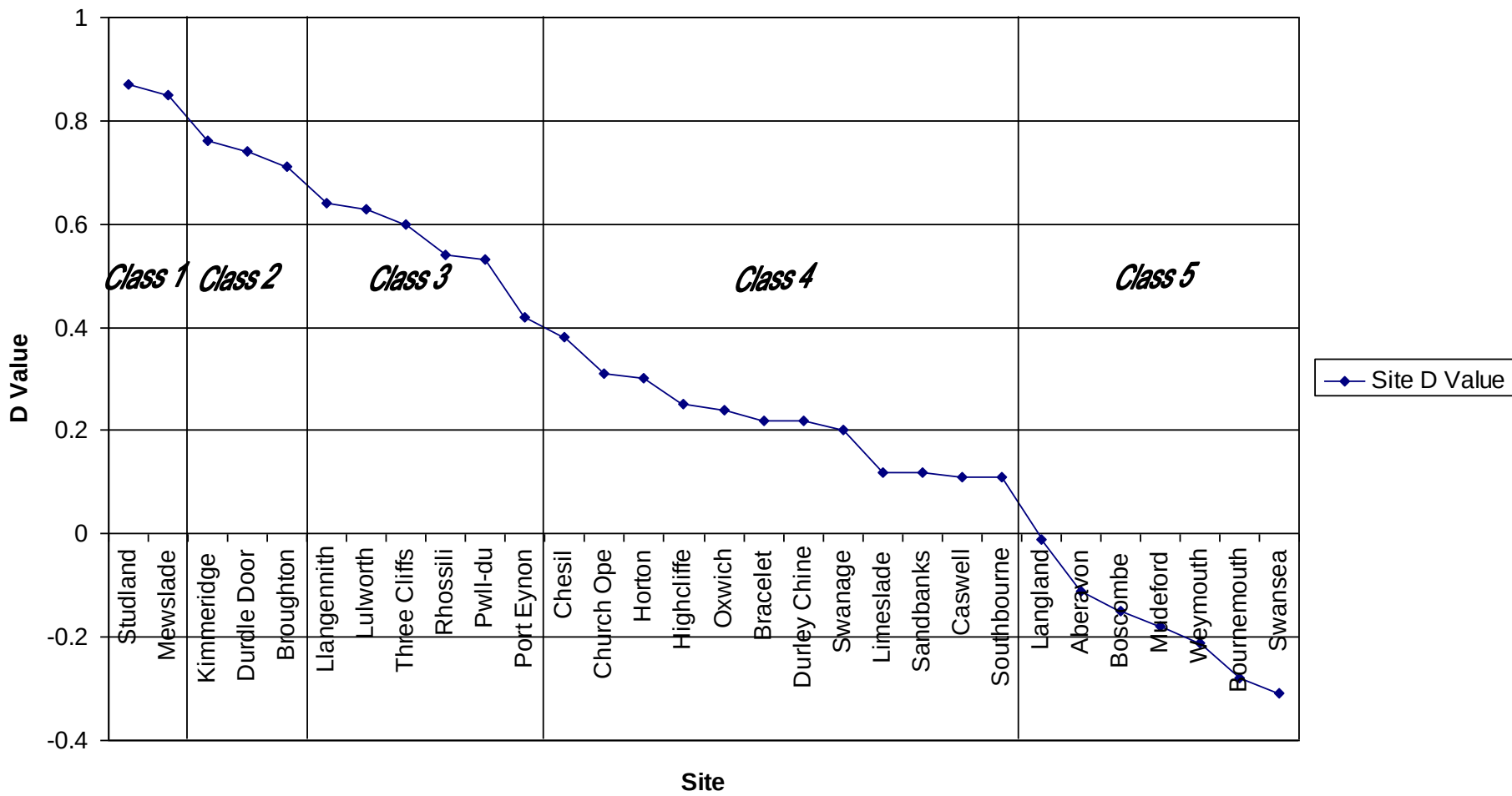
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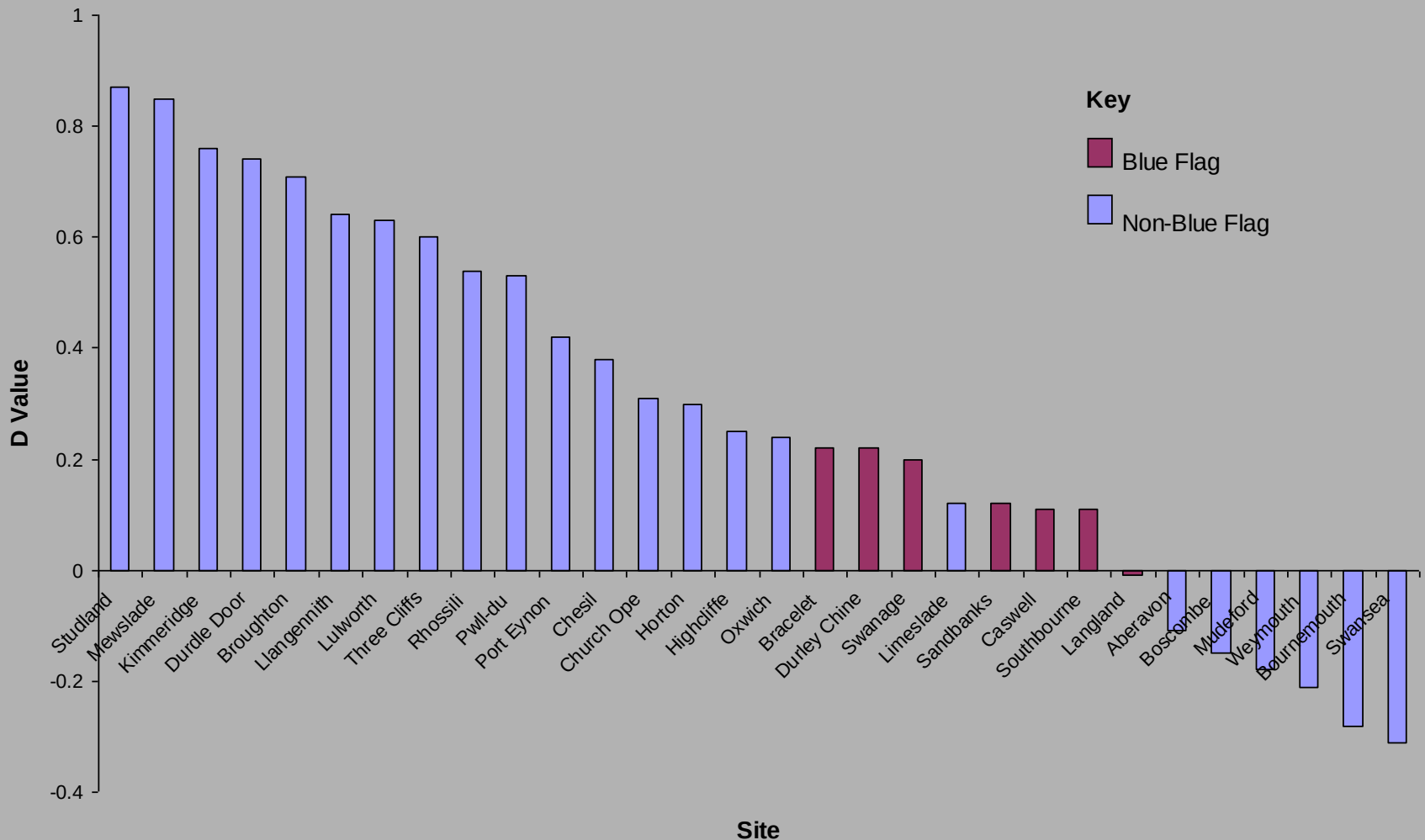
Italics
MCS

Bold
ENCAMS

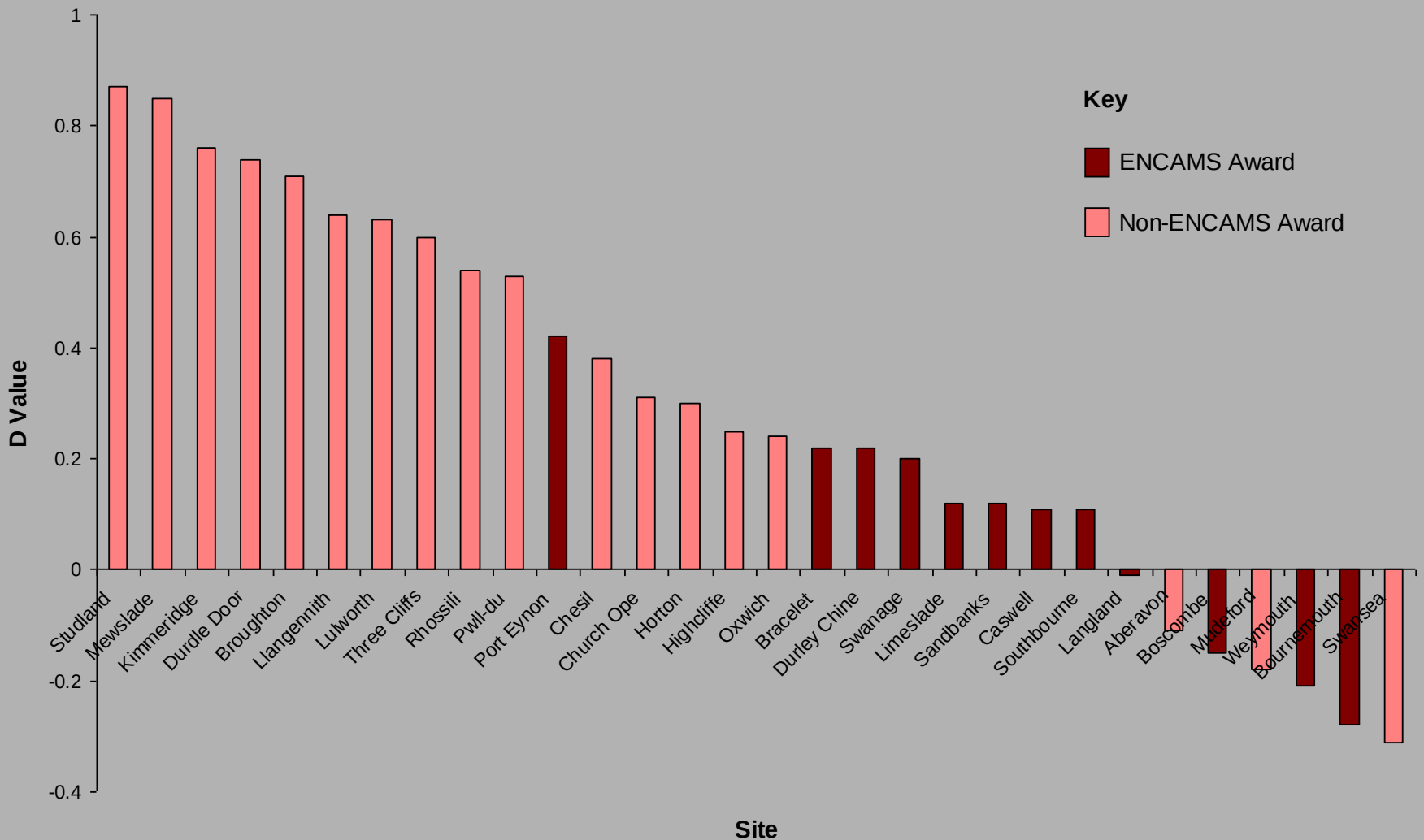
GREEN
Green
Coast
Award

BLUE
Blue Flag
Award

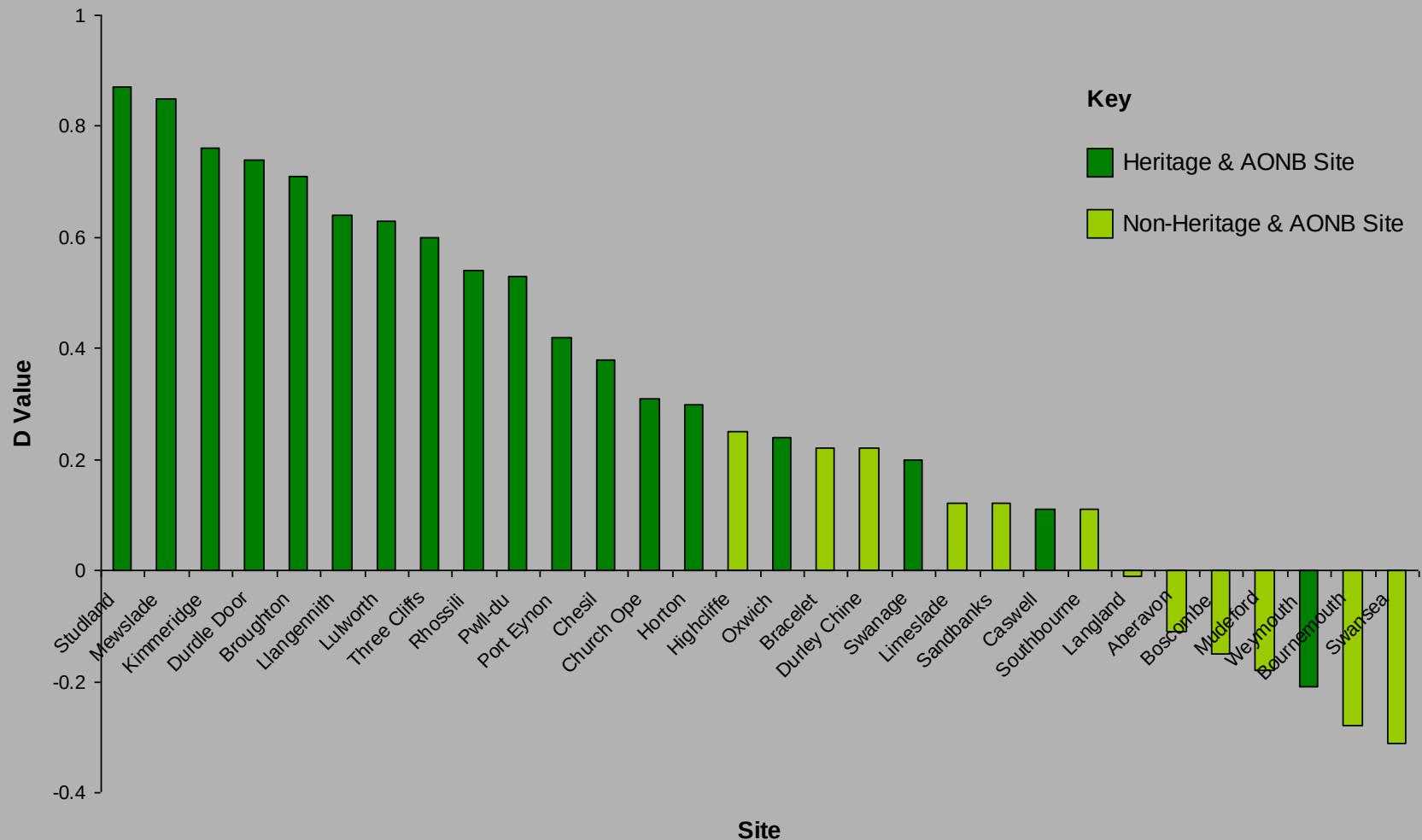




Blue Flag beaches tended to have similar scenic values and this is explained by the appraisal process favouring facilities and not scenery. Human parameters are more significant in the weighting process, but there was no significant difference in D values.



Beaches with few or no beach awards ranked higher than more tourism orientated beaches, but statistically, there was no significant difference



The scenic quality of Heritage Coast and AONB beaches was significantly higher, at the 99% confidence level, than beaches outside these designated areas ($t = 4.4113$; $df = 28$; $P < 0.01$).

Conclusions

- **Beaches with few or no beach awards ranked higher than more tourism orientated beaches, but statistically, there was no significant difference between Blue Flag beaches and those without this designation;**
- **No correlation between Beach Awards and scenic ranking;**
- **Scenic quality of Heritage Coast and AONB beaches was significantly higher, at the 99% confidence level, than beaches outside these designated areas ($t = 4.4113$; $df = 28$; $P < 0.01$).**
- **there was no significant difference between the scenic values of SW England and SW Wales beaches**