European Community Directive
on the Conservation of Natural Habitats
and of Wild Fauna and Flora
(92/43/EEC)

Second Report by the United Kingdom under Article 17

on the implementation of the Directive from January 2001 to December 2006

Conservation status assessment for :

H2120: Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)

Please note that this is a section of the report. For the complete report visit http://www.jncc.gov.uk/article17

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H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

Audit trail compiled and edited by JNCC and the UK statutory nature conservation agencies Coastal Lead Coordination Network.

This paper and accompanying appendices contain background and data used to complete the standard EC reporting form (Annex D), following the methodology outlined in the document entitled "Assessment, monitoring and reporting under Article 17 of the Habitats Directive, Explanatory Notes & Guidelines, Final Draft 5, October 2006." The superscript numbers below cross-reference to the headings in the corresponding Annex D reporting form. This supporting information should be read in conjunction with the UK approach for habitats (see 'Assessing Conservation Status: UK Approach').

1. National-biogeographic level information

1.1. General description & correspondence with National Vegetation Classification (NVC) and other habitat types

Table 1.1.1 provides a summary description of H2120 and its relations with UK classifications.

Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') encompasses most of the vegetation of unstable dunes where there is active sand movement. Under these conditions sand-binding marram *Ammophila arenaria* is always a prominent feature of the vegetation and is usually dominant. In the UK the majority of such vegetation falls within NVC type SD6 *Ammophila arenaria* mobile dune community. This is a dynamic vegetation type maintained only by change. It can occur on both accreting and eroding dunes, but will rapidly change and disappear if stability is imposed. It rarely occurs in isolation because of its dynamic nature and because it is successionally related to other dune habitats. The habitat type excludes the low, embryonic dunes where occasional exposure to saltwater flooding constrains the growth of marram and where plants of the strandline mingle with salt-tolerant, sand-binding grasses; such vegetation is referable to Annex I type H2110 Embryonic shifting dunes.

The species composition of shifting dunes is constrained by the harsh conditions, but the vegetation is by no means uniform. The most marked floristic variation relates to the degree of instability. Where sand accretion is extremely rapid it is possible to find vegetation that consists only of *A. arenaria*. As rates of sand deposition decline the marram is joined by more species, first by other specialised dune plants, then by less specialised grasses, drought-tolerant annuals and a restricted number of specialised bryophytes such as the moss *Tortula ruralis* ssp. *ruraliformis*. This moss plays an important part in completing the stabilisation of the sand surface. Towards the seaward edge of the zone of shifting dunes, salt-tolerant plants such as sea sandwort *Honckenya peploides* may be prominent, along with the sand-binding sand couch *Elytrigia juncea*. Further inland these species are rarely prominent.

There is also geographical variation in the floristic composition of the habitat type. A number of typical shifting dune plants such as Portland spurge *Euphorbia portlandica* and sea-holly *Eryngium maritimum* are mostly confined to the south of the UK, while lyme-grass *Leymus arenarius* is much more abundant in the northern half of Britain, where the vegetation may fall within the NVC type SD5 *Leymus arenarius* mobile dune community.

Shifting dunes along the shoreline with *Ammophila arenaria* are found throughout the coastal zone of the EU. This habitat type is geographically widespread around the UK coastline, although in many places it is restricted to a narrow strip.

Table 1.1.1 Summary description of habitat H2120 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
National Vegetation Classification (NVC)	In the UK, the majority of vegetation which conforms to this type falls within NVC types: SD6 *Ammophila arenaria* mobile dune community. SD5 *Leymus arenarius* mobile dune community, particularly in the north of the British Isles (not listed in Interpretation Manual).	Note that SD5 and SD6 are generally treated as a single community in most continental vegetation classification schemes. Occasionally in very open stands, SD5 may form part of H2110 Embryonic shifting dunes.
Biodiversity Action Plan (BAP) priority habitat type	Coastal sand dune.	Covers a much wider zone than H2120. Coastal sand dunes in the UK comprise the complete sand dune complex, including in addition embryo dunes, grey dunes, dune heath and dune slack communities.
EU Interpretation Manual	H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes).	Mobile dunes forming the seaward cordon or cordons of dune systems of the coasts.
Phase 1 Survey	H6.8 Open dune.	Also includes H2110 Embryonic shifting dunes (white dunes) and in part, H2130 Fixed dunes with herbaceous vegetation (grey dunes).
Common Standards Monitoring (CSM) reporting categories	Supralittoral sediment.	Covers a much wider zone than H2120. Includes all zones of sand dune: embryo, white dune, grey dune, dune heath and dune slack.

2. Range [2.3]

2.1 Current range

Range surface area [2.3.1]: 3,267 km²
Date calculated [2.3.2.]: May 2007
Quality of data [2.3.3.]: Moderate

The surface area estimate was calculated within alpha hull software, using extent of occurrence as a proxy measure for range (see Map 2.1.1). The value of alpha was set at 25 km; the alpha hull software used to calculate the surface area of the range could only be clipped to a 10km strip width along the coast. The geomorphological and physical factors influencing the distribution of the habitats are likely to occur only within a far smaller distance of the coastline (at most 1km) and hence the area value has been reduced by a factor of 10 to give a more realistic value for the surface area of the range for these habitats.

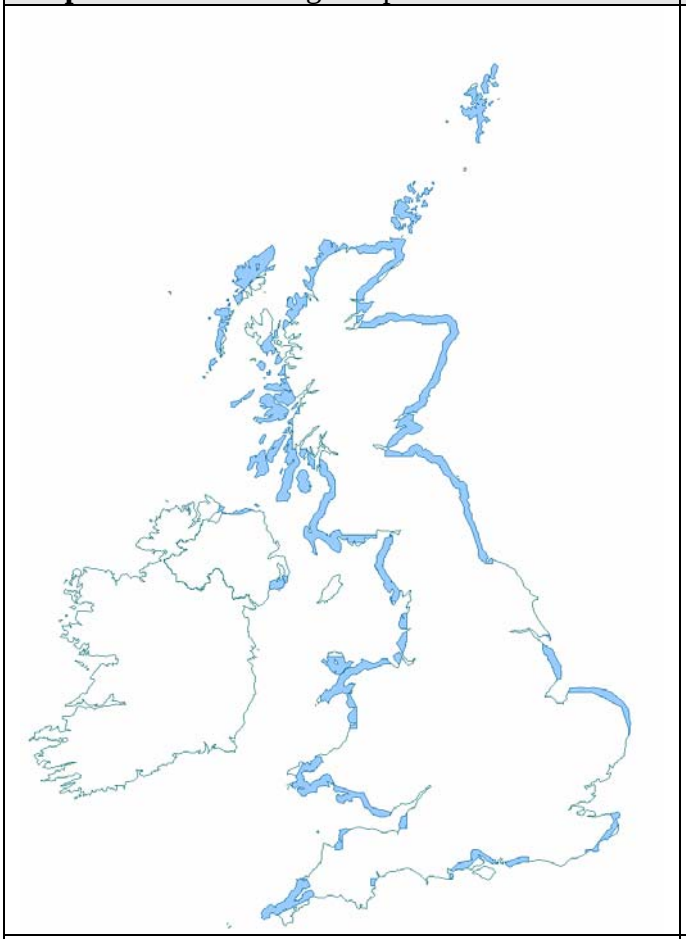
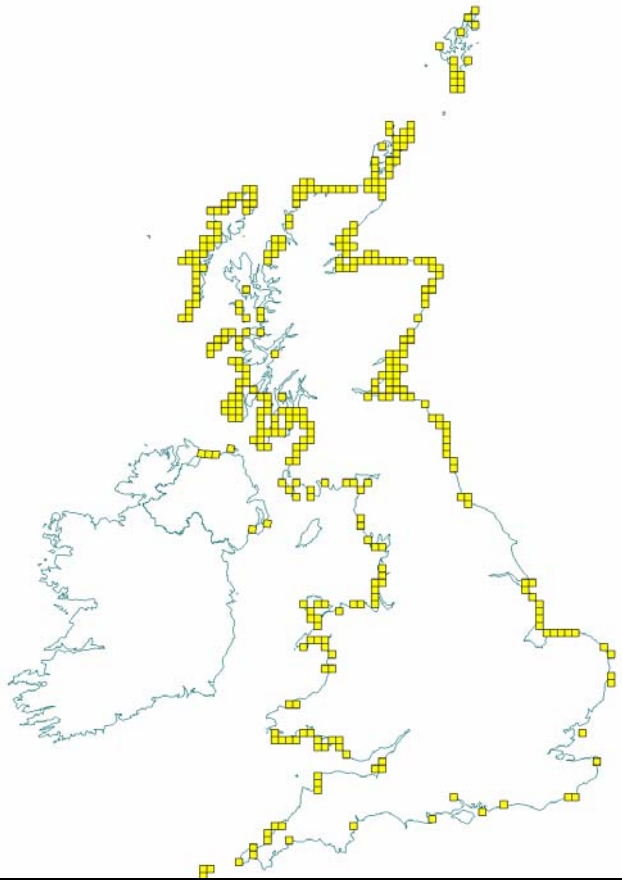
Maps 2.1.1 and 2.1.2 show the range and distribution of H2120 in the UK. These are based on fairly comprehensive records for NVC type SD6 together with Special Areas of Conservation (SACs) supporting this Annex I type.

2.2 Trend in range since c.1994

Trend in range[2.3.4]: Stable
Trend magnitude[2.3.5]: Not applicable
Trend period[2.3.6]: 1994 -2006

Reasons for reported trend[2.3.7]: Not applicable

Although dune systems are naturally dynamic structures, their general locations have remained mostly stable despite some turnover in area (see Section 3.2), shifting white dunes have been less affected by land reclamation during historical and recent times compared to fixed dune types that occur further inland. They benefit by being naturally dynamic. Available evidence indicates little or no contraction in range in recent or even historic times. Comparison of the current range of H2120 (Map 2.1.1-2) and the general location of all sandy beaches and dunes in Britain (Map 2.1.3) shows a high degree of correspondence. Although dune systems are naturally dynamic structures, their general locations have been stable for many centuries, so Map 2.1.3 can be taken to represent the former and potential natural range. On this basis, the range of H2120 does not appear to have declined at either a UK or regional level.

Map 2.1.1 Habitat range map [1.1] for H2120	**Map 2.1.2** Habitat distribution map [1.2] for H2120
	
Range envelope shown in blue/grey shade in above map is a minimum convex polygon constructed using JNCC Alpha Shapes tool (see Technical note I for details of methodology).	Each yellow square represents a 10x10km square of the National Grid and shows the known and/or predicted occurrence of this habitat. 10-km square count**:** 357

See Section 7.1 for map data sources

2.3 Favourable reference range

Favourable reference range[2.5.1]: 3,267 km^2

Section 3.2.1.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference range estimates for habitats have been determined in the UK. Based on this approach, the current surface area, 3, 267 km^2, has been set as the favourable reference area. Reasons for this are discussed below.

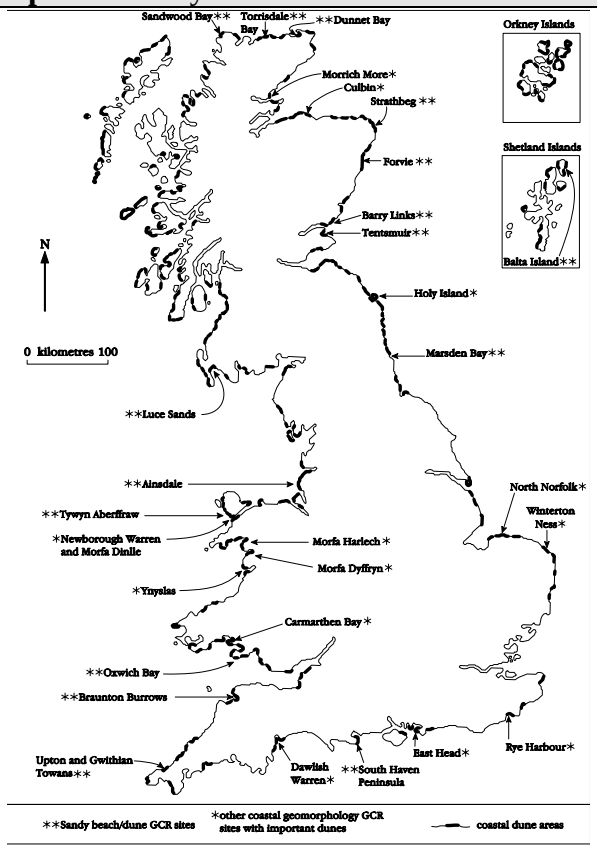
White dunes generally depend upon a supply of fresh sand, so the most extensive areas of the habitat are largely restricted to accreting, rather than eroding dune systems. However, even where the coastline is largely eroding, the habitat can still maintain itself, as sand is re-mobilised and may begin to accrete in

some areas. In a similar way, erosion – and particularly blow-outs – can lead to considerable quantities of sand being released back into the system, leading to the secondary development of white dunes.

Section 3.3 gives details about potentially suitable situations for H2120. The habitat has the potential to occur on most UK coastal areas that support sand dunes and are widely distributed around the UK coast where conditions are suitable – i.e. the presence of sufficient mobile sand to develop into a dune complex. Gaps in the range of shifting white dunes occur primarily where physiographic features are unsuitable for sand dune formation.

The potential range of H2120 once extended to all localities where sufficient mobile sand was available. Some of this land has been developed on or lost due to other causes (see Section 3.2), which has caused some contraction in area. Even so, white dunes are still widely distributed along suitable stretches of coast, sufficient to say that the current range still broadly covers most, if not all, of the former and potential natural range (see Section 2.2). Thus, the current range of H2120 appears sufficient to cover the favourable reference range for the habitat.

Map 2.1.3 Sandy beaches and dunes in Britain



From**:** May & Hansom (2003)

2.4 Conclusions on range

Conclusion[2.6.i]: Favourable

Despite some losses of area, embryonic shifting dunes are still widely distributed along suitable stretches of coastline around the UK. The current range still appears to cover most, if not all, of its former and potential natural range. This implies that the favourable reference range is occupied. The highly dynamic nature of the habitat has allowed it to respond to localised losses.

3. Area [2.4]

3.1 Current area

Total UK extent [2.4.1]: **22.2km^2**
Date of estimation [2.4.2]: **May 2007**
Method [2.4.3]: **2 = based on remote sensing data**
Quality of data [2.4.4]: **Moderate**

Table 3.1.1 provides information on the area of H2120 in the UK. Comprehensive extent data are available from the Sand Dune Survey of Great Britain (1987-1990) and the subsequent Sand Dune Vegetation Survey of Scotland. The Sand Dune Database and other survey reports provide information on NVC communities SD5 and SD6. The figure for Northern Ireland is an estimate based on expert opinion. In terms of extent, some shifting white dunes are moderately extensive – e.g. Braunton Burrows in England, Morfa Dyffryn in Wales, Sands of Forvie in Scotland – but in general, the habitat occurs as a linear feature, towards the seaward edge of more stable inland dune communities, which comprise a much larger proportion of the total sand dune complex. This reflects the limiting physiographic factors.

Table 3.1.1 Area of H2120 in the UK

	Area (ha)	Method [2.4.3]	Quality of data [2.4.4]
England	780	2	Moderate
Scotland	950	2	Moderate
Wales	480	2	Moderate
Northern Ireland	10	1	Poor
Total UK extent [2.4.1]	2,220	2	Moderate

Method used to estimate the habitat surface area: 1 = only or mostly based on expert opinion; 2 = based on remote sensing data; 3 = ground based survey. Only the most relevant class is given if more than one applies.
Quality of habitat surface area data: 'Good' e.g. based on extensive surveys; 'Moderate' e.g. based on partial data with some extrapolation; 'Poor' e.g. based on very incomplete data or on expert judgement

3.2 Trend in area since c.1994

Trend in area[2.4.5]: **Decreasing**
Trend magnitude[2.4.6]: **Unknown**
Trend period[2.4.7]: **1950 to present**
Reasons for reported trend[2.4.8]: **3 – Direct human influence**
4 – Indirect anthropogenic or zoogenic influence
5 – Natural processes

There is little doubt that some losses of H2120 have occurred due to development, recreational pressures and coastal defences. This habitat has, however, been less affected by land reclamation compared to fixed dune types that occur further inland, and it has been encouraged in places using a variety of sediment trapping techniques.

There have also been some changes due to sea-level rise. For example, 67 of the 121 (55%) sites surveyed in England were affected by net marine erosion, compared to only 21 (17%) with net progradation (Radley 1994). However, erosion in some locations may be – at least partially – offset by accretion in other areas.

More importantly, however, is the degree to which mobile dunes have stabilised over the last half century or so, developing widely into fixed 'grey' dunes. Newborough Warren in Wales, for example, was much more mobile in the 1950s with mobile dunes occupying over 70% of the site as opposed to just 6% in 2000 (Rhind *et al.* 2001). There is good evidence that this stabilisation was typical for many other dune systems (e.g. Carter and Wilson 1990, Pye 1990). This suggests there have been very substantial losses in area of H2120: at Newborough Warren mobile dunes have declined by 90% overall and by 5% averaged

per year over the last 50 years. Even though this trend may not be representative of global UK trends, it provides evidence that there have been recent declines in H2120.

3.3 Favourable reference area

Favourable reference area[2.5.2]: 22.2 km^2

Section 3.2.2.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference area estimates have been determined in the UK. Based on this approach, the current extent, 22.2 km^2, has been set as the favourable reference area. Reasons for this are discussed below.

H2110 has the potential to occur on most UK coastal areas that support sand dune systems and have sufficiently large amounts of mobile sand. Shifting dunes depend upon a supply of mobile sediment. Although a small amount of this material comes from eroding coastlines such as cliffs, the majority is derived from the seabed, through reworking of glacial deposits. Therefore, in the UK, the supply of sand should be regarded as a finite resource. Material that has been washed up on the shore is redistributed by the wind when the surface dries out between tides. A breeze of just over 4.5m/s will start moving dry sand.

Shifting dunes generally occur out of the reach of the highest tide – in contrast to H2110 Embryonic shifting dunes – but where there is still active sand movement. In some areas where the cover of more stable communities has been damaged, natural processes or wind erosion can lead to blow-outs. Shifting white dunes may colonise these areas as sand grains are re-mobilised. Cycles of erosion followed by stability are part of the natural development of dunes and are essential to the maintenance of diversity.

H2120 shifting white dunes are still widely distributed along suitable stretches of coast (see Section 2.2), sufficient to judge that ecological variation in the habitat is adequately accounted for. Nonetheless, their extent has declined drastically during the last 50 years. This has been due partly to development, but much of the contraction has been due to the stabilisation of more mobile dunes (see Section 3.2).

3.4 Conclusions on area covered by habitat

Conclusion[2.6.ii]: Unfavourable – Inadequate

It is believed that the area of this habitat has declined mainly due to dune stabilisation and habitat loss and that this decline is still occurring. The dynamic nature of the habitat means that it has been capable of responding – but only partly – to losses of sand dune habitat. The current area is likely to be less than the favourable reference area.

4. Specific structures and functions **(including typical species)**

4.1 Main pressures [2.4.10]

The factors affecting coastal sand dunes are covered in the Habitat Action Plan (HAP) coastal sand dunes (UKBAP website). The factors affecting H2120 are listed below. The related EC codes are shown in brackets.

- Erosion and progradation (**900 erosion**)

Unless artificially constrained, the seaward edges of sand dunes can be a highly mobile feature, though there is a natural trend to greater stability further inland. Very few dune systems are in overall equilibrium, and a majority of those in the UK demonstrate net erosion rather than net progradation; insufficient sand supply is frequently the underlying cause. There is no particular geographical distribution of either trend, both normally being present along any one stretch of coastline, and often within individual sites. Changes may be cyclical, both seasonally and over longer periods of time. Landward movement of mobile dunes often entails loss of fixed dune and dune heath habitat, as the latter are usually stable, or retreat may be impeded by development; in a few cases dune systems may move

inland where not artificially constrained. The net loss of dune habitat in England to erosion has been estimated as not more than 2% of the resource over the next 20 years.

- Recreation (**622 walking, horse riding and non-motorised vehicles, 623 motorised vehicles**)

Recreation is a major land use on sand dunes. Many dune systems are used extensively by holiday-makers, mostly on foot but also for parking cars and in some cases for driving four-wheel-drive vehicles or motorcycles. Moderate pressure by pedestrians may cause little damage, and may even help to counteract the effects of abandonment of grazing. However, excessive pedestrian use, as on routes between car parks and beaches, and vehicular use in particular, have caused unacceptable erosion on many dune sites. Recreational pressures can also prevent vegetation colonisation.

- Sea defence and stabilisation (**871 sea defence or coast protection works**)

Many dune systems are affected by sea defence works or artificial stabilisation measures such as sand fencing and marram planting. These practices are particularly prevalent on the more developed coastlines where drifting sand may be perceived as a threat to urban or holiday developments. While carefully applied dune management measures can help to counteract severe erosion which may threaten the existence of a dune, engineered defence systems usually reduce the biodiversity inherent in the natural dynamism of dune systems, and may cause sediment starvation down-drift – e.g. the construction of sea defences can affect sediment supply, cliff defences will halt cliff erosion, and groynes can interrupt longshore drift that transports sediment in a prevailing direction. UK dunes as a whole suffer from over-stabilisation and poor representation of the mobile phases.

- Beach management (**302 removal of beach material, 622 walking, horse riding and non-motorised vehicles, 623 motorised vehicles**)

The seaward accretion of dune systems takes place through the accumulation of wind-blown sand caught by plants or debris along the driftline; the initial accumulations are colonised by pioneer plant species and form embryo dunes. On some heavily used beaches this process is inhibited by pressure of pedestrian or vehicular traffic, or by beach cleaning using mechanical methods, where the organic nuclei for sand deposition may be removed. These factors may remove the minor obstacles which would catch the sand initially, or destroy the embryo dunes at an early stage in their formation. In either case a dune system in a location where the physical conditions exist for accretion may actually be static or eroding.

- Other human influences (**302 removal of beach material, 400 Urbanised areas, human habitation, 410 Industrial or commercial areas, 422 disposal of industrial waste, 421 disposal of household waste**)

Sand dunes have also been affected in the past by housing developments, industrial development, waste tips on or adjacent to them, fly tipping and sand extraction. Sand removal is clearly a direct impact on the habitat, while offshore dredging can also affect sediment supply.

- Air pollution (**702 air pollution**)

Based on an assessment of the exceedence of relevant critical loads (see technical note 3), air pollution is not considered to be a potentially significant pressure to the structure and function of this habitat. However, the Habitat Action Plan (HAP) for Coastal sand dunes considers atmospheric nutrient deposition as a factor affecting the habitat.

4.2 Current condition

4.2.1 Common Standards Monitoring (CSM) condition assessments

Condition assessments based on CSM (see http://www.jncc.gov.uk/page-2199) provide a means to assess the structure and functioning of H2120 in the UK. The following attributes were examined for all CSM assessments relevant to the habitat:

- Physical structure: functionality and sediment supply.
- Vegetation structure: range of zones.
- Vegetation composition: typical species.
- Vegetation composition: condition and flowering/fruiting of foredune grasses.
- Vegetation composition: negative indicator species.
- Other negative indicators.
- Indicators of local distinctiveness.

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H2120. These data were collated in January 2007. The maps give an impression of the overall spread of where unfavourable and favourable sites exist (summary statistics for the map are given in Section 7.2). The combined assessments show that of the SACs assessed:

- 51% of the area and 40% of the number of assessments was unfavourable; and
- at least 51% of the total UK habitat area was in unfavourable condition.

Sites of Special Scientific Interest (SSSI)/Areas of Special Scientific Interest (ASSI) condition assessments

Table 4.2.2 and Maps 4.2.2 and 4.2.3 summarise the CSM condition assessments that were judged to be either strongly or weakly indicative of the condition of the Annex I habitat on SSSI/ASSIs (see Technical note II for details of methodology behind this). These data were collated in January 2007. The maps give an impression of the overall spread of where unfavourable and favourable sites exist (summary statistics for the maps are given in Section 7.2). The combined condition assessments show that of the SSSI/ASSI assessments considered:

- 65% of strongly indicative assessments and 48% weakly indicative assessments were unfavourable.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H2120. See notes below table for details. Information on the coverage of these results is given in Section 7.2

Condition	Condition sub-categories	Area (ha)	Number of site features
Unfavourable	Declining	278	4
	No change	09	1
	Unclassified		
	Recovering	284	4
	Total	571	9
	% of all assessments	***39%***	***30%***
	% of total UK resource	***26%***	***Unknown***
Favourable	Maintained	587	13
	Recovered		
	Unclassified	305	8
	Total	892	21
	% of all assessments	***61%***	***70%***
	% of total UK resource	***40%***	***unknown***

Notes

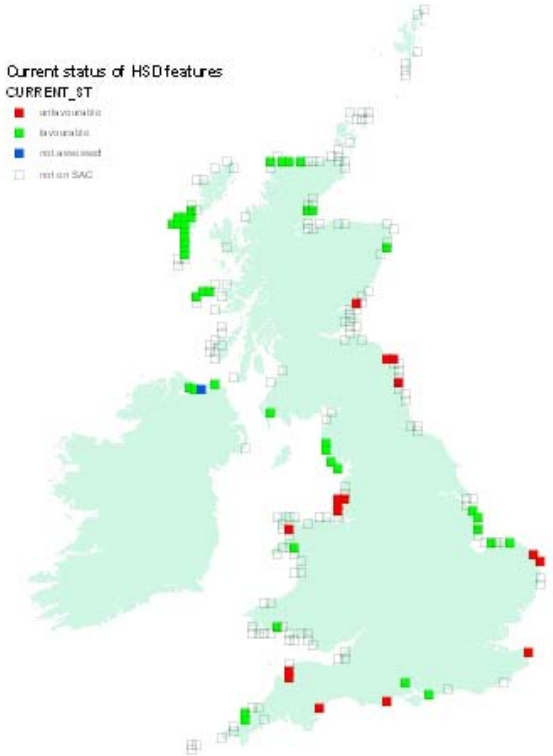
1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC. (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).
3. Only assessments made for qualifying interest features on SAC have been included in this analysis.
4. Area figures for CSM assessments have been calculated using the data presented on the standard Natura 2000 data forms submitted to the EU.

Table 4.2.2 CSM condition assessment results for UK SSSI/ASSIs that were judged to be either strongly or weakly indicative of the condition of H2120 on SSSI/ASSIs. See notes below table and Technical note II for further details

Condition	Condition sub-categories	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Unfavourable	Declining	5	10
	No change	5	15
	Unclassified		1
	Recovering	30	3
	Total	40	29
	% of all assessments	***65%***	***48%***
Favourable	Maintained		31
	Recovered		
	Unclassified	22	
	Total	22	31
	% of all assessments	***35%***	***52%***

Notes
1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
2. The data included are from CSM assessments carried out between April 1998 and December 2006.

Current Condition of H2120 based on CSM condition assessments (See Sections 4.2 and 7.2 for further information)

Map 4.2.1 SAC assessments	**Map 4.2.2** Assessments strongly indicative of the condition on SSSI/ASSIs	**Map 4.2.3** Assessments weakly indicative of the condition on SSSI/ASSIs
		
Key Red = unfavourable, i.e. the square contains at least one SAC where this habitat feature is present and has been judged to be unfavourable Green = favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been assessed as favourable but there are no unfavourable SAC features Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported Transparent = SAC feature not present, i.e. the square does not contain any SAC features of this habitat type	Key* Green – 80 – 100% of assessed features on 10km square are favourable Yellow - 50 – 80% of assessed features on 10km square are favourable Orange - 20 – 50% of assessed features on 10km square are favourable Red - 0 – 20% of assessed features on 10km square are favourable *This is the same key as was used for JNCC CSM Report 2006	

4.3 Typical species

Typical species[2.5.3]: None used

Typical species assessment[2.5.4]: Not applicable

Several species show a medium to very high degree of faithfulness to this habitat or at least to the related sand dune community types (SD5 and SD6) within the NVC. Trends in the occurrence of these species across the UK during the last 25 years are set out in the table below. Unfortunately there are no available trend data at the UK-level for these species. The other species are not particularly faithful to the habitat or to the main related sand dune community type (SD16) within the NVC, so available trend data at the UK-level is not particularly meaningful and has not been utilised here.

Table 4.3.1 Trends and faithfulness of selected typical species for H2120

Typical species	Faithfulness to habitat H2120 (based on analysis of NVC synoptic tables)	Trend over last 25 years from BSBI atlas – based on change in 10 km square occupancy across UK (see http://www.jncc.gov.uk/page-3254)
Lupinus arboreus	Very high	No data
Bryum algovicum	Medium	No data
Calystegia soldanella	Low	Significant decline, but <25% in 25yrs
Leymus arenarius	Low	Significant increase, but <25% in 25yrs
Cynoglossum officinale	Low	Significant decline, but <25% in 25yrs
Eryngium maritimum	Low	Significant decline, but <25% in 25yrs
Euphorbia paralias	Low	No significant change
Atriplex laciniata	Low	Significant increase, but <25% in 25yrs
Ammophila arenaria	Very low	Significant increase, but <25% in 25yrs

4.4 Conclusions on specific structures and functions (including typical species)

Conclulsion[2.6.iii]: Unfavourable – Bad

The EC Guidance states that where "more than 25% of the area of the habitat is unfavourable as regards its specific structures and functions", the conclusion should be Unfavourable – Bad. In the UK this was generally taken to mean that more than 25% of the habitat area in unfavourable condition.

CSM site condition assessments show that a large (39% of SAC, 26% of total UK resource) part of this habitat is classed as in unfavourable condition in terms of UK resource. The data shows that more than 25% of the habitat is unfavourable, that the necessary structures and functions for the habitat are not in place and that significant deteriorations/pressures exist. Although CSM SAC data clearly demonstrates that nearly 13% of the UK resource in considered to be recovering, this is counterbalanced by the same proportion being classed as declining.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

- Protection within designated sites

Around 66% of the resource of H2120 lies within SACs with management measures specifically aimed at maintaining and enhancing the features for which they are designated, and to address some of the pressures listed within Section 4.1 and the future threats listed in Section 5.1.2. A significant proportion of the resource of this habitat also lies within the SSSI/ ASSI series where similar management measures are in place.

- UK BAP

The habitat is covered by the Coastal sand dunes action plan under the UK Biodiversity Action Plan (see http://www.ukbap.org.uk), as well as under country and local biodiversity action plans and strategies, with targets to maintain, improve, restore and expand the resource.

5.1.2 Main future threats[2.4.11]

The most obvious major future threats to H2120 are listed below, several of which are referred to in Section 4.1. The related EC codes are shown in brackets.

- Recreation (**622 walking, horse riding and non-motorised vehicles, 623 motorised vehicles**)
- Sea defences and stabilisation (**871 sea defence or coast protection works**)
- Beach management (**302 removal of beach material, 622 walking, horse riding and non-motorised vehicles, 623 motorised vehicles**)
- Erosion and progradation (**900 erosion**)
- Other human influences (**302 removal of beach material, 400 Urbanised areas, human habitation, 410 Industrial or commercial areas, 422 disposal of industrial waste, 421 disposal of household waste**)

These will continue to be threats to the long-term future of the habitat.

- Air pollution (**702 air pollution**)

Based on an assessment of the exceedence of relevant critical loads (see technical note 3), air pollution is not considered to be a potentially significant pressure to the structure and function of this habitat. However, the HAP for Coastal sand dunes considers atmospheric nutrient deposition as a factor affecting the habitat.

- Climate change (**900 erosion, 930 submersion**)

Based on the literature review (technical note 4) climate change is considered a major threat to the future condition of this habitat especially in the long term. However, there is a high degree of uncertainty in defining future climate threats on habitats and species due to uncertainty in: future greenhouse gas emissions; the consequential changes in climatic features (for instance temperature, precipitation CO_2 concentrations); the responses of habitats and species to these changes (for instance location, phenology, community structure) and the role of other socio-economic drivers of environmental change. The scale of change in habitats and species as a result of climate change will vary across ecosystems. Small changes in the climate are more likely to have a substantial impact on habitats and species which exist within a narrow range of environmental conditions. The future impacts of climate change on UK biodiversity will be exacerbated when coupled with other drivers of environmental change.

5.2 Future condition **(as regards range, area covered and specific structures and functions)**

5.2.1 CSM condition assessments

The CSM condition assessments reported in Sections 4.2.1-2 provide a basis to predict the potential future condition of H2120 in the UK. This involved treating all assessments currently identified as either favourable or unfavourable recovering as future-favourable: remaining categories were treated as future-unfavourable – see Table 5.2.1. There are a number of caveats to this approach, which are set out beneath this table.

SAC condition assessments

Table 5.2.1 and Map 5.2.1 summarise the predicted potential future condition of H2120 on UK SACs. This is based on the approach described above. The maps give an impression of the overall spread of where future-unfavourable and future-favourable sites are predicted to occur (summary statistics for the map are given in Section 7.2). The combined assessments show that of the SACs assessed:

- 80% of the area and 83% of the number of assessments fall within the future-favourable category; and
- at least 53% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H2120 based on current CSM condition assessments. See notes below table for details. Information on the coverage of these results is given in Section 7.2.

Future condition	Present condition	Area (ha)	Number of site features
Future-unfavourable	Unfavourable declining	278	4
	Unfavourable no change	09	1
	Unfavourable unclassified		
	Total	288	5
	% of assessments	***20%***	***17%***
	% of total UK extent	***13%***	***Unknown***
Future-favourable	Favourable maintained	587	13
	Favourable recovered		
	Unfavourable recovering	284	4
	Favourable unclassified	305	8
	Total	1,176	25
	% of assessments	***80%***	***83%***
	% of total extent	***53%***	***Unknown***

Note that the scenario presented above is based on the same information as used to construct the Table 4.2.1. It is based on the following premises:
(i) the unfavourable-recovering condition assessments will at some point in the future become favourable;
(ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
(iii) sympathetic management will be sustained on sites already classified as favourable and these will not be seriously damaged by any unforeseen events.
IMPORTANT NOTE: We do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'favourable' condition being attained.

Table 5.2.2 Predicted future condition of H2120 on SSSI/ASSIs based on CSM assessments that were judged to be either strongly or weakly indicative of the condition. See notes below table and Technical note II for further details.

Future condition	Present condition	Number of assessments	
		Strongly indicative assessments (Category 1)	**Weakly indicative assessments (Category 2)**
Future-unfavourable	Unfavourable declining	5	10
	Unfavourable no change	5	15
	Unfavourable unclassified		1
	Total	10	26
	% of assessments	***16%***	***43%***
Future-favourable	Favourable maintained		31
	Favourable recovered		
	Unfavourable recovering	30	3
	Favourable unclassified	22	
	Total	52	34
	% of assessments	***84%***	***57%***

Note that the scenario presented above is based on the same information as used to construct the Table 4.2.2. It is based on the following premises:
(i) the unfavourable-recovering condition assessments will at some point in the future become favourable;
(ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
(iii) sympathetic management will be sustained on sites already classified as favourable and these will not be seriously damaged by any unforeseen events.

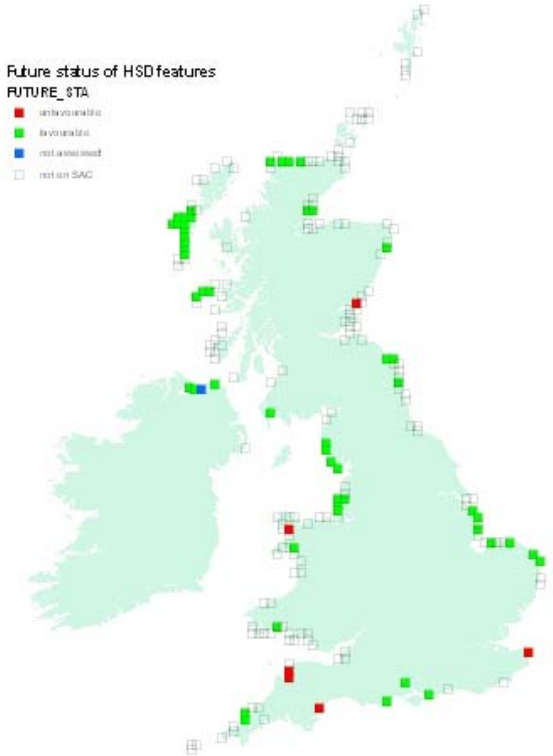
IMPORTANT NOTE: We do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'favourable' condition being attained.

SSSI/ASSI condition assessments

Table 5.2.2, and Maps 5.2.2 and 5.2.3 summarise the predicted potential future condition of H2120 on UK SSSI/ASSIs. This is based on the approach described above and utilises condition assessments that were judged to be either strongly or weakly indicative of the condition of the Annex I habitat on SSSI/ASSIs (see Technical note II for details of methodology behind this). The maps give an impression of the overall spread of where unfavourable and favourable sites exist (summary statistics for the maps are given in Section 7.2). The combined condition assessments show that of the SSSI/ASSI assessments considered:

- 84% of strongly indicative assessments and 57% weakly indicative assessments fall within the future-favourable category.

Predicted Future Condition of H2120 based on CSM condition assessments (See Sections 5.2 and 7.2 for further information on these maps)

Map 5.2.1 SAC assessments	**Map 5.2.2** Assessments strongly indicative of the condition on SSSI/ASSIs	**Map 5.2.3** Assessments weakly indicative of the condition on SSSI/ASSIs
		
Key Red = future-unfavourable, i.e. the square contains one or more SACs where this habitat feature is present and has been predicted to be future-unfavourable Green = future-favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been predicted to be future-favourable Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported Transparent = SAC feature not present, i.e. the square does not contain any SAC features of this habitat type	Key* Green – 80 – 100% of assessed features on 10km square are favourable Yellow - 50 – 80% of assessed features on 10km square are favourable Orange - 20 – 50% of assessed features on 10km square are favourable Red - 0 – 20% of assessed features on 10km square are favourable *This is the same key as was used for JNCC CSM Report 2006	

5.3 Conclusions on future prospects (as regards range, area covered and specific structures and functions)

Conclusion[2.6.iv]: Unfavourable – Inadequate

The EC Guidance states that where habitat prospects are intermediate between "good with no significant impacts from threats expected and long-term viability assured" and "bad with severe impacts from threats expected and long-term viability not assured", the judgement should be Unfavourable – Inadequate. In the UK, this was generally taken to mean that range and/or area are stable or decreasing, and between 75-95% of the habitat area is likely to be in favourable condition in 12-15 years.

Furthermore, the assumptions made in this analysis may not reflect the actual position, as there are a number of factors – in particular, climate change and sea level rise – that may be beyond the ability to influence directly by management. The key issue is to ensure that the habitat maintains its ability to adapt to these changes. The UK BAP, working towards enhancing future viability, has targets to bring the dune systems into favourable or recovering condition by 2010 while maintaining the current extent. Given progress already made and some additional recovery once further conservation measures are put into place, the expectation is that circa 13% of the habitat will be in unfavourable condition in the next 10-15 years.

6. Overall conclusions and judgements on conservation status [2.6]

Conclusion[2.6]: Unfavourable – Bad

On the basis of Structure and Function, the overall conclusion for this habitat feature is Unfavourable – Bad.

Table 6.1 Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Favourable	Current range is stable and not less than the favourable reference range.	2
Area covered by habitat type within range	Unfavourable – Inadequate	Current extent is below the favourable reference area, but not by more than 10%.	2
Specific structures and functions (including typical species)	Unfavourable – Bad	More than 25% of the habitat area is considered to be unfavourable as regards its specific structures and functions.	2
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Inadequate	Habitat prospects considered to be intermediate between "good with no significant impacts from threats expected and long-term viability assured" and "bad with severe impacts from threats expected and long-term viability not assured.	2
Overall assessment of conservation status	Unfavourable – Bad	On the basis of Structure and Function, the overall conclusion for this habitat feature is Unfavourable – Bad.	2

Key to confidence in judgement: 1 = High; 2 = Medium; 3 = Low

7. Annexed material (including information sources used 2.2)

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7.2 Further information on CSM data as presented in Sections 4.2 and 5.2

Table 7.2.1 Summary of the coverage of the data shown in Tables 4.2.1 and 5.2.1

Data	Value
Number of SACs supporting feature (a)	32
Number of SACs with CSM assessments (b)	30
% of SACs assessed (b/a)	94
Extent of feature in the UK – hectares (c)	2,220
Extent of feature on SACs – hectares (d)	1,471
Extent of features assessed – hectares (e)	1,463
% of total UK hectarage on SACs (d/c)	66
% of SAC total hectarage that has been assessed (e/d)	99
% of total UK hectarage that has been assessed (e/c)	66

Notes

1. Extent of features on SACs (d) includes only those features that have been submitted on the official Natura 2000 data form as qualifying features. This figure is based on the habitat extent figures presented on standard Natura 2000 data forms.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).

Table 7.2.2 Summary of grid square map data shown in Maps 4.2.1-3 and 5.2.1-3

Status	Number of squares	Proportion of all squares
Current – Unfavourable (red)	16	8%
Current – Favourable (green)	41	20%
On SAC but not assessed (blue)	1	0%
Not on SAC (transparent)	150	72%
Total Number of 10km squares (any colour)	208	100%
Future – Unfavourable (red)	6	3%
Future – Favourable (green)	51	25%