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 :

H2110: Embryonic shifting dunes

H2110 Embryonic shifting 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 information and data used to complete the standard EC reporting form (Annex D), following the methodology outlined in the commission document "Assessment, monitoring and reporting under Article 17 of the Habitats Directive, Explanatory Notes and 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 H2110 and its relations with UK classifications.

Embryonic shifting dune vegetation exists in a highly dynamic state and is dependent on the continued operation of physical processes at the dune/beach interface. It is the first type of vegetation to colonise areas of incipient dune formation at the top of a beach. On a prograding dune system this vegetation may be the precursor to the main dune-building vegetation dominated by marram *Ammophila arenaria*. In most cases Embryonic shifting dunes are transient and will either be displaced by marram-dominated vegetation as the dunes develop (H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")) or will be washed away by storms. The continued supply of new sand from the beach plain into the dune system is therefore vital to the continued existence of this community, even if this sand is derived from within the same system. The habitat type is of exceptional importance as an indicator of the general structural and functional 'health' of a dune system. Creation of new dune habitat, and indeed the long-term survival of the dune system at which it occurs, is often dependent upon the survival of this habitat type.

Embryonic shifting dunes are inherently species-poor and have a limited range of floristic variation. The predominant plants are strandline species such as sea rocket *Cakile maritima* and the two salt-tolerant, sand-binding grasses: lyme-grass *Leymus arenarius* and sand couch *Elytrigia juncea*. These grasses generally occur slightly higher up the beach profile than the true strandline species. There is some geographical variation, even within this very simple vegetation type. While both dune-binding grasses have a wide geographical range, lyme-grass is more abundant in the north and east of Britain and sand couch is more abundant in the south and west. Marram *Ammophila arenaria* is a common constituent of the habitat type throughout its range.

In the UK the majority of vegetation which conforms to this type belongs to NVC type SD4 *Elymus farctus* ssp. *boreali-atlanticus* foredune community, but certain stands of SD2 *Honkenya peploides – Cakile maritima* strandline community (on sand) and SD5 *Leymus arenarius* mobile dune community may also be referable to this Annex I type when they occur in close association with the *Elymus* community.

By their very nature, Embryonic shifting dunes are restricted in the area they can occupy. They are made even scarcer by the fact that only a relatively small number of dunes are actively prograding, the condition under which this habitat type develops best. Embryonic shifting dunes are also particularly vulnerable to trampling by beach users and to mechanical cleaning of beaches, and this may well be a significant factor in limiting their extent.

This habitat type rarely occurs in isolation, because it may initiate dune succession, and it is invariably one of several Annex I habitat types to be found on a dune system.

This habitat type has a wide European distribution, and has been recorded from coasts in the Atlantic, Mediterranean, Continental and Boreal Regions. Embryonic shifting dunes are a rare habitat type in the UK, covering much less than 1,000 ha.

Table 1.1.1 Summary description of habitat H2110 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
NVC	In the UK the majority of vegetation which conforms to this type belongs to NVC type SD4 *Elymus farctus* ssp. *boreali-atlanticus* foredune community. Certain stands of SD2 *Honkenya peploides – Cakile maritima* strandline community (on sand) and SD5 *Leymus arenarius* mobile dune community may also be referable to this Annex I type when they occur in close association with the *Elymus* community.	In most cases, however, SD5 forms part of H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes); SD2 forms part of the H1210 Annual vegetation of drift lines.
BAP priority habitat type	Coastal sand dune.	Covers a much wider zone than H2110. Coastal sand dunes in the UK comprise the complete sand dune complex, including in addition white dunes, grey dunes, dune heath and dune slack communities.
EU Interpretation Manual	H2110 Embryonic shifting dunes.	Formations of the coast representing the first stages of dune construction constituted by ripples or raised sand surfaces of the upper beach, or by a seaward fringe at the foot of tall dunes.
CSM reporting categories	Supralittoral sediment.	Covers a much wider zone than H2110. Includes all zones of sand dune: embryo, white dune, grey dune, dune heath and dune slack.

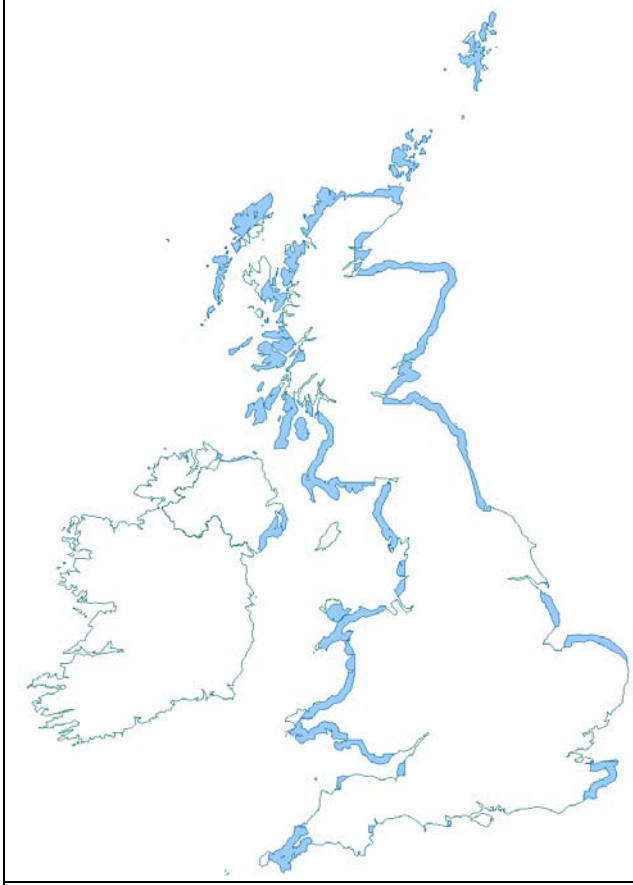
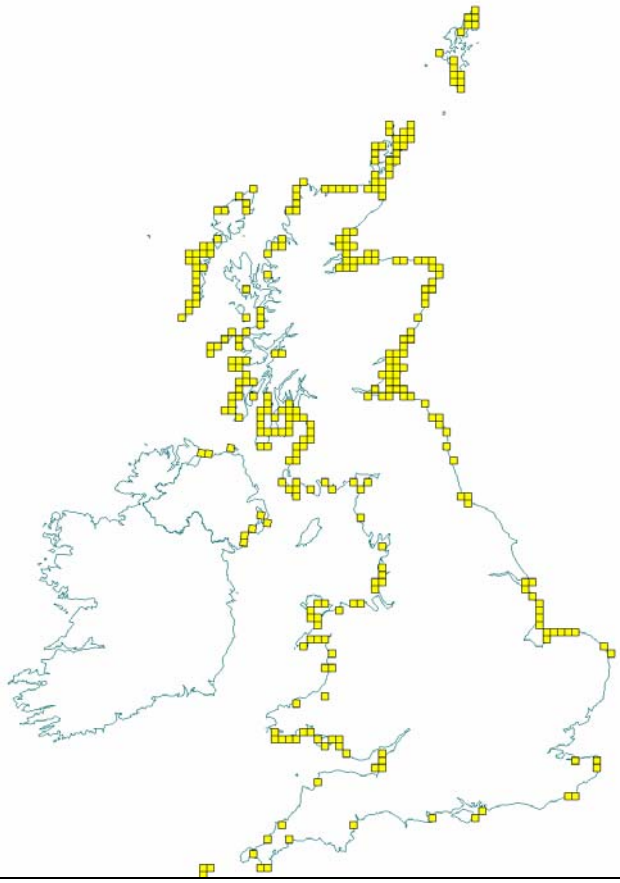
2. Range [2.3]

2.1 Current range

Range surface area [2.3.1]: 3,342 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 H2110 in the UK. These are based on fairly comprehensive records for NVC types SD2, SD4 and SD5, together with Special Areas of Conservation (SACs) supporting this Annex I type.

Map 2.1.1 Habitat range map [1.1] for H2110	**Map 2.1.2** Habitat distribution map [1.2] for H2110
	
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: 308

See Section 7.1 for map data sources

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**

Despite some turnover in area (see Section 3.2), embryonic shifting dunes have been less affected by land reclamation during historical and recent times compared to other dune types. They benefit by forming the frontal part of dune systems and 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 H2110 (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 H2110 does not appear to have declined at either a UK or regional level.

2.3 Favourable reference range [2.5.1]

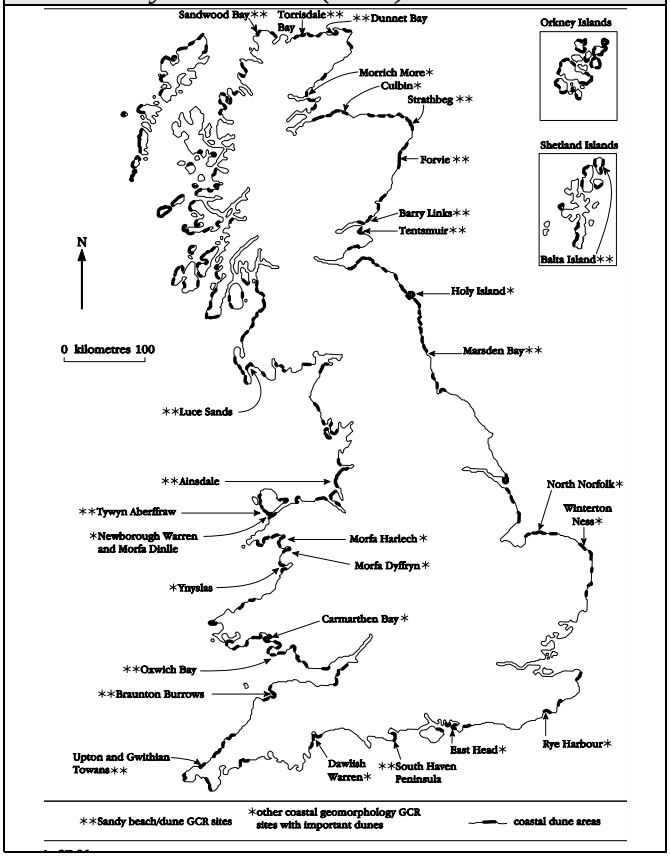
Favourable reference range: 3,342 km^2

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, 3,342 km^2, has been set as the favourable reference area. Reasons for this are discussed below.

Section 3.3 gives details about potentially suitable situations for H2110. The habitat has the potential to occur on most UK coastal areas that support sand dune systems and have sufficiently large amounts of mobile sand. Gaps occur primarily where physiographic features are unsuitable for sand dune formation.

The potential range of H2110 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, embryonic 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). The distribution within the range is even and there is sufficient regional representation of the habitat. The current range of H2110 is considered viable and equates 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 most or all 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]: **2.95km^2**
Date of estimation [2.4.2]: **May 2007**
Method [2.4.3]: **3 = ground based survey**
Quality of data [2.4.4] **Moderate**

Table 3.1.1 provides information on the area of H2110 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 (Dargie 2000). The Sand Dune Database and other survey reports provide information on NVC community SD4. However, this community is also characteristic of pioneer vegetation of gently-sloping beaches all around the coast, which were not covered by the sand dune survey. In terms of extent, embryonic dunes tend to represent a very small proportion of the total sand dune complex. The habitat invariably occurs as a linear feature, towards the seaward edge of more stable inland dune communities. This reflects the limiting physiographic factors. The most extensive areas of the habitat occur in England along the north Northumberland coast, in Scotland at Dornoch Firth and Morrich More, and in Wales at Aberfraw.

Table 3.1.1 Area of H2110 in the UK.

	Area (ha)	Method [2.4.3]	Quality of data [2.4.4]
England	100	3	Moderate
Scotland	90	3	Moderate
Wales	100	3	Moderate
Northern Ireland	5	3	Moderate
Total UK extent [2.4.1]	295	3	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]: **Stable**
Trend magnitude[2.4.6]: **Not applicable**
Trend period[2.4.7]: **1994-2006**
Reasons for reported trend[2.4.8]: **Not applicable**

There has not been a UK-wide assessment of change in area of this habitat. Loss in habitat area of coastal sand dunes has occurred as a result of such factors as past reclamation and development. Between 1800 and 1950 there were significant changes as large areas of sand dune were reclaimed for agriculture or developed on. For example, about 40% of the original Sefton coast dune area has been lost to development, mostly since the mid-1800s (Smith 1999).

The overall consequence of these changes for embryo dunes is difficult to assess. Development, recreational pressures and coastal defences all clearly have the potential to impact upon the habitat. In addition, there are inevitable, but not quantified, changes as a result of sea-level changes. 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. Furthermore, the habitat is naturally dynamic and capable of maintaining itself in some areas on an annual basis, with a seasonal cycle of sand accretion during summer and erosion during winter. Embryonic dunes have been less affected by land reclamation compared to other dune types, as they benefit from forming the frontal part of dune systems. In some areas, the habitat has been encouraged from bare sand using a variety of sediment trapping techniques.

However, such treatment has generally been aimed at restoring or stabilising other dune habitats, in particular grey dune. Overall, it seems that despite some turnover, the area of H2110 has been relatively stable since 1994.

3.3 Favourable reference area

Favourable reference area[2.5.2]: 2.95 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, 2.95 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. Embryonic 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 eroding, the habitat can still maintain itself in some locations on an annual basis, going through a seasonal cycle of development during the calmer conditions of summer, followed by winter erosion.

H2110 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 resulted in some contraction in area. However, embryonic 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. In addition, the habitat area has remained broadly stable since 1994. The current range is considered to be viable.

3.4 Conclusions on area covered by habitat

Conclusion[2.6.ii]: Favourable

The area of H2110 has remained stable since 1994 and the current area is considered viable, with sufficient regional representation of the habitat. The current area therefore equates 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 for Coastal sand dunes* (UKBAP website). The factors affecting H2110 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 (**690 Other leisure and tourism impacts not referred to above**)

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 III), air pollution is not considered to be a potentially significant pressure to the structure and function of this habitat. However, the Habitat Action Pan (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 H2110 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.

SACs condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H2110. 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.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H2110. 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	29	2
	No change	09	3
	Unclassified		
	Recovering	124	3
	Total	162	8
	% of all assessments	***51%***	***40%***
	% of total UK resource	***51%***	***Unknown***
Favourable	Maintained	109	8
	Recovered		
	Unclassified	46	4
	Total	155	12
	% of all assessments	***49%***	***60%***
	% of total UK resource	***49%***	***unknown***

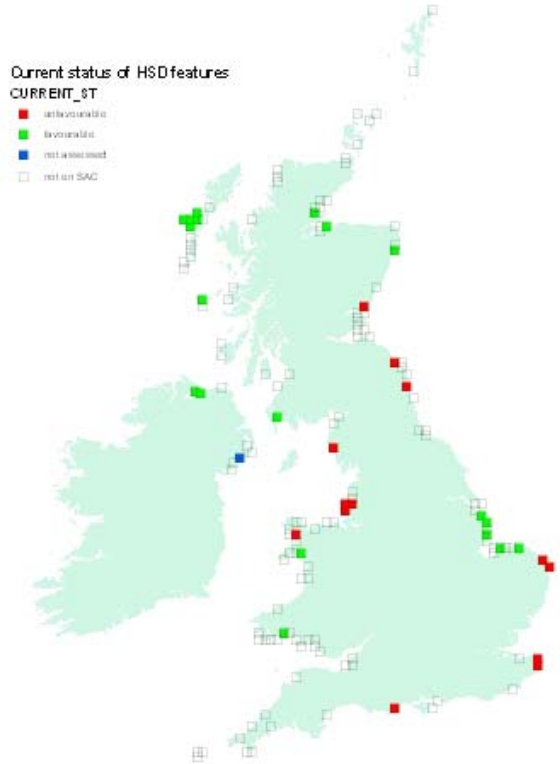
Notes

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.

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

SSSI/ASSIs CSM condition assessments are not relevant as most or all the resource is on SACs.

Current Condition of H2110 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
	Not applicable	Not applicable
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]: ***Polygonum oxyspermum, Atriplex laciniata, Cakile maritima***

Typical species assessment[2.5.4]: Change in 10 km square occupancy across UK over last 25 years

Several species show a medium to high degree of faithfulness to this habitat or at least to the three main related sand dune community types (SD2, SD4 and SD5) 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. All showed significant increases, mostly of less than 25%. These data suggest that at least some species associated with H2110 have increased in occurrence, though not necessarily within this sand dune type.

Table 4.3.1 Trends and faithfulness of selected typical species for H2110

Typical species	Faithfulness to habitat H2110 (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)
Polygonum oxyspermum	High	Significant increase, but <25% in 25 years
Atriplex laciniata	Medium	Significant increase, but <25% in 25 years
Cakile maritima	Medium	Significant increase, but <25% in 25 years
Eryngium maritimum	Low	Significant decline, but <25% in 25 years
Atriplex glabriuscula	Low	Significant decline, but <25% in 25 years
Leymus arenarius	Low	Significant increase, but <25% in 25 years
Euphorbia paralias	Low	No significant change

Some seeds can germinate and grow on the strandline. Such species include *Atriplex* spp. (on detritus deposited at the tidal limit) or, beyond the reach of all but the most extreme tide, *Honckenya peploides* and *Cakile maritima*. Around these strandline plants and detritus, small patches of sand can accumulate, forming a narrow band between the tidal limit and the stable or accreting hinterland of the shore. This is prone to colonisation by *Elytrigia juncea*, *Leymus arenarius* or *Ammophila arenaria*, thereby initiating foredune formation, including both embryonic shifting dunes and shifting white dunes. *Eryngium maritimum* and *Euphorbia paralias* may come to colonise with *Elytrigia juncea*, and will subsist along with other survivors of the strandline assemblages, such as *Honckenya peploides*, *Salsola kali*, *Cakile maritima* and *Atriplex* spp.

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

Conclusion[2.6.iii]: Unfavourable – Bad but improving

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 (51%) 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 and pressures exist. However, nearly 40% of the UK resource in considered to be recovering.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

- Protection within designated sites

All the resource of H2110 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.

- UK Biodiversity Action Plan (BAP)

The habitat is covered by the *Coastal sand dunes* action plan under the UK BAP (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 H2110 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 III), 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 IV) 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 H2110 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 H2110 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:

- 88% of the area and 75% of the number of assessments fall within the future-favourable category; and
- at least 87% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H2110 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	29	2
	Unfavourable no change	09	3
	Unfavourable unclassified		
	Total	38	5
	% of assessments	***12%***	***25%***
	% of total UK extent	***12%***	***Unknown***
Future-favourable	Favourable maintained	109	8
	Favourable recovered		
	Unfavourable recovering	124	3
	Favourable unclassified	46	4
	Total	280	15
	% of assessments	***88%***	***75%***
	% of total extent	***87%***	***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;

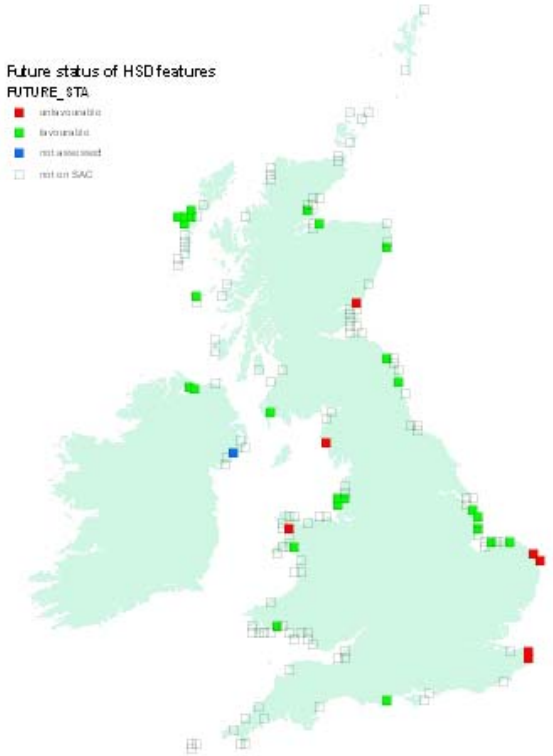
(ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;

(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.

SSSI/ASSI condition assessments

SSSI/ASSIs CSM condition assessments are not relevant as most or all the resource is on SACs.

<table>
<tr><td colspan="3">Predicted Future Condition of H2110 based on CSM condition assessments (See Sections 5.2 and 7.2 for further information on these maps)</td></tr>
<tr><td>Map 5.2.1 SAC assessments</td><td>Map 5.2.2 Assessments strongly indicative of the condition on SSSI/ASSIs</td><td>Map 5.2.3 Assessments weakly indicative of the condition on SSSI/ASSIs</td></tr>
<tr><td> 
</td><td>Not applicable</td><td>Not applicable</td></tr>
<tr><td>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</td><td colspan="2">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</td></tr>
</table>

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

Conclusion[2.6.iv]: Unfavourable – Inadequate but improving

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.

CSM site assessment data predict that 12% by area (25% by number) of the UK SACs supporting habitat H2110 will remain unfavourable in future (12% of total UK resource). A substantial area (40%) is considered to be 'unfavourable recovering' compared to that considered to be 'unfavourable declining' (10%). 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 or there may be losses in area and range for this habitat as result of coastal squeeze. However, 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. Despite progress already made and some additional recovery once further conservation measures are put into place, the expectation is that less than 25% of the habitat will be in unfavourable condition in the next 10-15 years.

6. Overall conclusions and judgements on conservation status

Conclusion[2.6]: Unfavourable – Bad but improving

On the basis of the structure and function judgement, the overall assessment is Unfavourable – Bad but improving.

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	Favourable	Current area is stable and not less than the favourable reference area.	2
Specific structures and functions (including typical species)	Unfavourable – Bad but improving	More than 25% of the area of the habitat is unfavourable as regards its specific structures and functions. Significantly more of the resource in unfavourable condition is improving than declining.	1
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Inadequate but improving	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. Measures are in place and planned to address threats to future structure and function for the overall UK resource.	2
Overall assessment of conservation status	Unfavourable – Bad but improving	On the basis of the structure and function judgement, the overall assessment is Unfavourable – Bad but improving.	1

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

7. Annexed material (including information sources used 2.2)

7.1 References

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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)	22
Number of SACs with CSM assessments (b)	20
% of SACs assessed (b/a)	91
Extent of feature in the UK – hectares (c)	320
Extent of feature on SACs – hectares (d)	320
Extent of features assessed – hectares (e)	317
% of total UK hectarage on SACs (d/c)	100
% of SAC total hectarage that has been assessed (e/d)	99
% of total UK hectarage that has been assessed (e/c)	99

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)	13	9%
Current – Favourable (green)	19	13%
On SAC but not assessed (blue)	1	1%
Not on SAC (transparent)	115	78%
Total Number of 10km squares (any colour)	148	100%
Future – Unfavourable (red)	7	5%
Future – Favourable (green)	25	17%