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 :

H1320: *Spartina* swards (*Spartinion maritimae*)

H1320 *Spartina* swards (*Spartinion maritimae*)

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 and correspondence with National Vegetation Classification (NVC) and other habitat types

Table 1.1.1 provides a summary description of H1320 and its relations with UK classifications.

Cord-grass *Spartina* spp. colonises a wide range of substrates, from very soft muds to shingle, in areas sheltered from strong wave action. It occurs on the seaward fringes of saltmarshes and creek-sides and may colonise old pans in the upper saltmarsh. The corresponding NVC types are:

SM4 *Spartina maritima* salt-marsh community
SM5 *Spartina alterniflora* salt-marsh community
SM13f *Puccinellia maritima* saltmarsh community, *Puccinellia maritima-Spartina maritima* sub-community

Four cord-grasses occur in the UK: small cord-grass *Spartina maritima*, smooth cord-grass *S. alterniflora*, Townsend's cord-grass *S.* x *townsendii* and common cord-grass *S. anglica.* The only native species is *S. maritima*. *S. alterniflora* is a naturalised non-native species that was accidentally introduced to the UK in the 1820s via ships' ballast from the eastern USA, where it is a major component of saltmarshes. The introduction of *S. alterniflora* and its subsequent crossing with *S. maritima* resulted in both a sterile hybrid *S.* x *townsendii* and later a fertile hybrid, *S. anglica.* Although a non-native, the surviving population of the parent *S. alterniflora* is of great scientific importance to evolutionary biologists. SM4, SM5 and SM13f are the only NVC communities that are referable to H1320 *Spartina* swards (*Spartinion maritimae*).

S. anglica was extensively planted in the past as an aid to stabilisation of intertidal mudflats and a stimulus to enclosure and land-claim. It also readily colonises open mudflats and consequently has spread rapidly around the coast. Monoculture swards of either *S. anglica* or *S.* x *townsendii* are of little intrinsic value to wildlife, and in many areas *S. anglica* is considered a threat to the intertidal mudflats used as feeding-grounds by large populations of waders and wildfowl. As a result, attempts have been made to control *S. anglica* at several sites over many years, but these have largely been unsuccessful in eliminating it. *S. anglica* is generally considered to be a negative conservation feature of the sites where it occurs, although in some areas, such as the Dee Estuary, it can act as a pioneer species for the formation of H1330 Atlantic salt meadow (Dargie 2001).

Spartina swards have a wide distribution in the EU, especially on Atlantic coasts. *S. maritima* is limited by climatic factors to a few localities in south-eastern England. Since the 1960s, *S. alterniflora* has declined, largely due to industrial and marine developments, and in the UK it is now restricted to a single site in Southampton Water (Maskell and Raybould 2001). *S. maritima* has also declined, but there are still

substantial populations on the Essex coast. *S.* x *townsendii* is present in quantity only in Southampton Water.

Table 1.1.1. Summary description of habitat H1320 and its relations with UK vegetation/habitat classifications.

Classification	Correspondence with Annex I type	Comments
NVC	The corresponding NVC types are: • SM4 *Spartina maritima* salt-marsh community. • SM5 *Spartina alterniflora* salt-marsh community. • SM13f *Puccinellia maritima* saltmarsh community, *Puccinellia maritima-Spartina maritima* sub-community.	Cordgrass swards dominated by *Spartina anglica* are classified as SM6 *Spartina anglica* salt-marsh community. Only SM4, SM5 and SM13f communities are considered to be part of the annex 1 habitat. SM13f is a rare sub-community in which *S. maritima* can be abundant.
BAP priority habitat type	Coastal saltmarsh. The BAP habitat action plan states "For the purposes of this action plan, the lower limit of saltmarsh is defined as the lower limit of pioneer saltmarsh vegetation (but excluding seagrass *Zostera* beds) and the upper limit as one metre above the level of highest astronomical tides to take in transitional zones."	*Spartina* swards are clearly only a small part of this BAP priority habitat.
EU Interpretation Manual	Perennial pioneer grasslands of coastal salt muds, formed by *Spartina* or similar grasses. When selecting sites, preference should be given to those areas supporting rare or local *Spartina*. Sub-types 15.21 - Flat-leaved cordgrass swards: perennial pioneer grasslands of coastal salt muds, dominated by flat-leaved *Spartina maritima, S.x townsendii, S. anglica, S. alterniflora.* 15.22 - Rush-leaved cordgrass swards: perennial pioneer grasslands of southern Iberian coastal salt muds, dominated by the junciform-leaved *Spartina densiflora*. Plants: 15.21 – *Spartina maritima, S. alterniflora;* 15.22 – *Spartina densiflora* Corresponding categories UK classification: "SM4 *Spartina maritima* saltmarsh" and "SM5 *Spartina alterniflora* saltmarsh".	Although *S. anglica* is included within the 15.21 sub-type definition, cordgrass swards dominated by *S. anglica* (SM6) are not considered to be part of the annex 1 habitat. Therefore they are not included in this H1320 assessment report.
CSM reporting categories	Saltmarsh. The CSM generic guidance covers all zones of saltmarsh – pioneer saltmarsh, low-mid marsh, mid-upper marsh, driftline, and transitions. JNCC's *CSM for designated sites: first 6 year report* uses this single all-encompassing category.	SM4, SM5 and SM6 are included within the pioneer saltmarsh zone. H1320 is therefore much more restricted than this CSM reporting category.

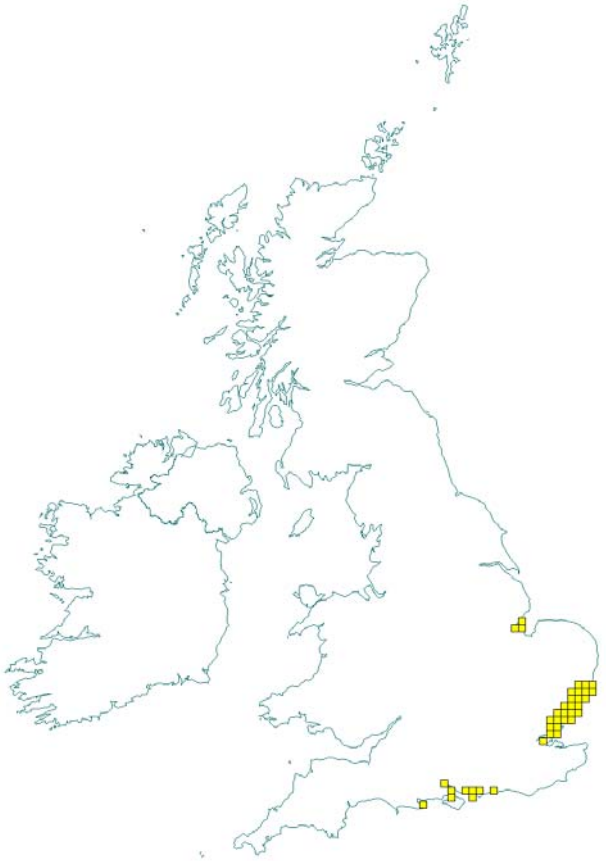
2. Range [2.3]

2.1 Current range

Range surface area [2.3.1]: **316 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 H1320 in the UK. The map shows areas where *S. maritima* or *S. alterniflora* are know to occur. The also occurs on the sites. Occurrences of the widely introduced invasive *Spartina anglica* and of rare and local hybrid *S.* x *townsendii*, which are not considered to be part of the annex 1 habitat, are not shown. The map does not show the occurrences in Scotland which are due to the introduction of *S. alterniflora*.

Map 2.1.1 Habitat range map [1.1] for H1320	**Map 2.1.2** Habitat distribution map [1.2] for H1320
	
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 10x10-km square of the National Grid and shows the known and/or predicted occurrence of this habitat. 10-km square count: 38

See Section 7.1 for map data sources

2.2 Trend in range since c.1994

Trend in range[2.3.4]: **Decreasing**
Trend magnitude[2.3.5]: **at least 1%**
Trend period[2.3.6]: **1987-1999**
Reasons for reported trend[2.3.7]: **3 – Direct human influence**
4 – Indirect anthropogenic or zoogenic influence
5 – Natural processes

The range of *S. maritima* has declined over the last 100 years (Preston *et al.* 2002, Rodwell 2000) and is still doing so (Stewart *et al.* 1994). *S. alterniflora* has always been mainly found in the Solent although it was planted in Devon, Essex and Scotland. Apart form the Solent, these occurrences are very limited. *S. maritima* was more widely distributed on the south coast, where it is now restricted to small areas in The Solent. Even within The Solent the populations are still declining. The situation on the east coast is less clear. The isolated Lincolnshire population is still present, but its abundance is unknown, and its isolation makes it vulnerable to catastrophic events. There has been a total loss of the Norfolk population as well as losses on the southern coast of England. According to the *New atlas of the British and Irish flora* (Preston *et al.* 2002) the Cord grass (*S. maritima*) has declined over the last 30 years. It was recorded in 35 locations between 1970 and 1986 and only in 28 10 km squares between 1987 and 1999. Taking the mid-point of each time frame – respectively 1978 and 1993 – to calculate the period of decline, one obtains a decline of 20% (seven squares out of 35) over 15 years, which yields a decline rate of decline of about 1.3% per annum. This scenario seems plausible given the existing ongoing pressures on the habitat (see 4.1). On this basis, it is considered that the range is likely to have declined by at least 1% per annum since 1994.

2.3 Favourable reference range

Favourable reference range[2.5.1]: **Unknown**

S. maritima is the dominant native species of the NVC community SM4. It is typically found in middle and upper saltmarshes, only occasionally as a pioneer species on intertidal mud. It is considered to be at the climatic limit of its range in the UK (Stewart *et al.* 1994). However there is evidence that its range was more extensive in the past, reaching south Devon in the west and including stretches of the Sussex and Kent coasts from which it is currently completely absent (Preston *et al.* 2002, Clapham *et al.* 1962). It is not clear why it has declined so much in the last century. It has been observed that it sets little viable seed at present (Marchant and Goodman 1969) and it is reported as only persisting as a perennial. However, the current period of climate warming should be benefiting this southern European species. Furthermore, Raybould *et al.* (1991) suggest that a range of other factors are affecting its distribution, including land claim and erosion. Preston *et al.* (2002) suggest competition from of *S. anglica* is important, contradicting Stewart *et al.* (1994).

The naturalised alien, *S. alterniflora*, (which defines SM5) used to have a wider distribution within The Solent. It is thought to have declined due to land claim and possibly from competion from *S. anglica* (Rodwell 2000), as well as coastal erosion (Gray *et al.* 1999), pollution and changes in coastal dynamics (Maskell and Raybould 2001). Its potential range could, therefore, be greater than its current range.

The range consists of three isolated zones, all of which suffer from adverse effects such as the competition with *S. anglica*. The population in The Wash seems very limited, with very small habitat patches (given the area estimate of less than 100 ha in the UK), and isolated from the two other locations where H1320 is found. Given the declines since 1994, this suggests that it is extremely vulnerable to extinction in this particular location, especially as *S. maritima* mainly has a vegetative reproduction, making it more sensitive to catastrophic events and less likely to recover from pressures such as coastal squeeze or competition with *S. anglica*.

H1320 occupied a relatively large range, including a portion of the Lincolnshire coast, the Norfolk coast, the Essex coast and the south coast of England, where it was found in Devon, Sussex and Kent. Due to

past losses, the current range only includes Lincolnshire, Essex and The Solent. These losses in range, especially with the rate of decline established in 2.2 are a concern for the long term maintenance of the habitat.

2.4 Conclusions on range

Conclusion[2.6.i]: Unfavourable – Bad and deteriorating

The range of H1320 is believed to have declined by at least 1% per annum between 1987 and 1999. This has induced a loss of ecological variation and the isolation of the remaining populations, one of which, in The Wash, seems in danger of disappearing, which could lead to a major contraction in range. The characteristic species, *S. maritima*, is out competed by an invasive hybrid, *S. anglica*, which threaten the remaining areas where H1320 is found. The present range is not considered viable in the long term and is considered to be more than 10% below the favourable reference range.

3. Area [2.4]

3.1 Current area

Total UK extent [2.4.1]: <1km^2
Date of estimation [2.4.2]: May 2007
Method [2.4.3]: 1 = only or mostly based on expert opinion
Quality of data [2.4.4]: Poor

Table 3.1.1 provides information on the area of H1320 in the UK. There are no comprehensive data available for the UK but there are only two sites where *S. maritima* or *S. alterniflora* are known to occur in any quantity, and the hybrid *S.* x *townsendii* is also restricted. The extent figure provided is an estimate based on expert opinion and is probably an over estimate of the actual figure. The Essex Estuaries Special Area of Conservation (SAC) is thought to support about 17 ha of the habitat, believed to be the largest stand in Europe (Posford Haskoning 2002). Stands of the widely introduced invasive *S. anglica* are not included in the figure.

Table 3.1.1 Area of H1320 in the UK

	Area (ha)	Method [2.4.3]	Quality of data [2.4.4]
England	<100	1	Poor
Scotland	Not present	-	-
Wales	Not present	-	-
Northern Ireland	Not present	-	-
Total UK extent [2.4.1]	<100	1	Poor

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]: 1987-1999
Reasons for reported trend[2.4.8]: 3 – Direct human influence
4 – Indirect anthropogenic or zoogenic influence
5 – Natural processes

S. alterniflora has always been limited to The Solent, but within this area it has declined significantlty and is now restricted to one small site. It was first recorded in Britain in 1829 in the river Itchen on the edge of The Solent. By the early 1900s it had spread more widely in The Solent (Marchant and Goodman

1969), but is now confined to only one location in The Solent (Southampton Water), where it is still receding due to coastal erosion (Gray *et al.* 1999).

Surveys were carried out in The Solent in the late 1990s (Gray *et al.* 1999) for *S. maritima* which was only found in two of the previously recorded locations. Only one of these appeared to be thriving. This habitat appears to have been disproportionately affected by the adverse pressures affecting saltmarshes on the south and east coasts of England over the last 100 years – land claim, coastal squeeze and in some places lack of sediment. It is likely that *S. anglica* has had, and continues to have, a competitive advantage over *S. maritima*, leading to further losses of the latter species at some sites.

3.3 Favourable reference area

Favourable reference area[2.5.2]: Unknown

Within their respective ranges (see section 2.3), the relevant *Spartina* species have the potential to occur widely on saltmarshes; they are not limited to narrow tidal ranges. Around 1900 this appears to have been the case – they occurred on saltmarshes on stretches of the coast from which they are now absent and, in areas where they still occur, they were present on more sites and were more abundant on sites where they still occur.

The pattern of changes in area mirrors that for range described in section 2.2. Between 1987 and 1999 not only has there been a reduction in range leading to a complete loss of area on a number of sites but, even on sites where it still occurs, there have been a major loss of area. Most of the relevant recent survey and monitoring work has been focused on The Solent (Gray *et al.* 1999, Maskell and Raybould 2000, Maskell *et al.* 2002, Ager *et al.* 1999). There is some suggestion from these reports that the pace of loss has increased in recent decades. Less information is available for the east coast populations, but it appears that the populations may not have suffered so severely up to now as those in The Solent which are still declining. Despite the fact that most studies focus on The Solent, the total losses of the Norfolk, Kent, Sussex and Devon populations are a clear indication that there has been a major loss of area. The current area for H1320 spans over 44 10-km squares, for an area of less than a 100 ha. On average, this represents less than 2.3 ha for each square, making it a potentially very fragmented habitat.

These past losses of range and area have left a fragmented, isolated, and vulnerable resource of H1320 habitat. It is not clear what area, configuration and connectivity the habitat needs to be considered viable. However, the current area is much less than the historic area and it continues to decline. The remaining population are isolated from one another and vulnerable to catastrophic events or pressures.

3.4 Conclusions on area covered by habitat

Conclusion[2.6.ii]: Unfavourable – Bad and deteriorating

There has been a major contraction in the area of *S. maritima*, and it is now restricted to The Solent, Essex and Lincolnshire. Even within The Solent the populations are still declining. The status of the isolated Lincolnshire population remains uncertain. *S. alterniflora* has always been limited to The Solent, but within this area it has declined significantly and is now restricted to one small area on one site. The remaining H1320 area is still decreasing and is considered to be more than 10% below the favourable reference area.

4. Specific structures and functions (including typical species)

4.1 Main pressures [2.4.10]

The H1320 habitat occurs on the south and east coasts of England, stretches of coast that are under severe pressure from sea level rise (both isostatic and eustatic), lack of sediment, and development. Individually and in combination these adversely affect the structure and function of saltmarsh in general (including

H1330 Atlantic salt meadows and H1310 Salicornia and other annuals colonising mud and sand), and this habitat in particular.

These and other adverse factors affecting the H1320 habitat are covered in the *Habitat Action Plan for Coastal Saltmarsh* (UKBAP website). The main pressures affecting H1320 are listed below. The related EC codes are shown in brackets.

- Erosion and 'coastal squeeze' (**900 erosion, 930 submersion**)

Erosion of the seaward edge of saltmarshes occurs widely in the high energy locations of the larger estuaries as a result of coastal processes. There is evidence that this process is exacerbated both by the isostatic tilting of Britain towards the south-east, and by climatic change leading to a relative rise in sea level and to increased storminess. Many saltmarshes are being 'squeezed' between an eroding seaward edge and fixed flood defence walls. The erosional process is exacerbated in some locations by a reduced supply of sediment. 'Coastal squeeze' is most pronounced in south-east England, where, for example, it is estimated that 20% of the saltmarsh resource in Kent and Essex was lost between 1973 and 1988. The best available information suggests that saltmarshes in the UK are being lost to erosion at a rate of 100 ha a year. In more western and northern regions, there is recent evidence of a trend towards net sea level rise which may be causing saltmarsh erosion, although the rates of loss are not known.

- Sediment dynamics (**851 modification of marine currents, 871 sea defence or coast protection works**)

Local sediment budgets may be affected by coast protection works, or by changes in estuary morphology caused by land claim, dredging of shipping channels and the impacts of flood defence works over the years.

- Land claim (**802 reclamation of land from sea, estuary or marsh**)

Large scale saltmarsh land claim schemes for agriculture are now rare. Piecemeal smaller scale land claim for industry, port facilities, transport infrastructure and waste disposal is still comparatively common, and marina development on saltmarsh sites occurs occasionally. Such developments usually affect the more botanically diverse upper marsh and landward transition zones.

- Other human influences (**420 Discharges, 701 water pollution, 703 soil pollution, 730 Military manoeuvres, 810 Drainage, 840 Flooding**)

Saltmarshes are affected by a range of other human influences including waste tipping, pollution, drowning by barrage construction, and military activity. Turf cutting is a traditional activity in some areas. Oil pollution can potentially destroy saltmarsh vegetation and whilst it usually recovers, sediment may be lost during the period of die-back. The effects of recreational pressure are not well understood but may be locally significant. Agricultural improvement (re-seeding and draining) has affected the upper edge and transition zones of some saltmarshes in the past and may still occur on a small scale. Eutrophication due to sewage effluent and agricultural fertiliser run-off has caused local problems of algal growth on saltmarshes.

- Cord grass *S. anglica* (**954 invasion by a species, 971 competition**)

The small cordgrass, *S. maritima*, is the only species of cordgrass native to Great Britain. The smooth cordgrass, *S. alterniflora*, is a naturalised alien that was introduced to the UK in the 1820s. This introduction led to its subsequent crossing with *S. maritima* resulting in both a sterile hybrid, Townsend's cordgrass *S.* x *townsendii*, and a fertile hybrid, common cordgrass *S. anglica*. The latter readily colonises mudflats and has spread around the coast. It has also been extensively planted to aid stabilisation of mudflats and as a prelude to land-claim. Common cordgrass often produces extensive monoculture swards of much less intrinsic value to wildlife, and in many areas is considered to be a threat to bird feeding grounds on mudflats. As a result, attempts have been made to control it at several locations, although in some areas it is undergoing dieback for reasons not fully understood.

- 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.

4.2 Current condition

4.2.1 Common Standards Monitoring (CSM) condition assessments

Condition assessments based on CSM (see www.jncc.gov.uk/page-2199) provide a means to assess the structure and functioning of H1320 in the UK. The following attributes were examined for all CSM assessments relevant to the habitat:

- Habitat extent.
- Physical structure: creeks and pans.
- Vegetation structure: zonation, sward structure.
- Vegetation composition: characteristic species; indicator of negative trend (*S. anglica*).
- Other negative indicators.

S. maritima is at the northern limit of its range in Britain, and is climatically restricted to the south and east coasts of England. Past losses of range and area have left a fragmented and isolated resource.

S. maritima is not limited to any one saltmarsh zone. In the UK it is currently more typical of the higher levels of saltmarshes (Stewart *et al.* 1994), although it is more characteristic of the pioneer zone on mainland European coasts (Rodwell 2000). There is some suggestion that its current distribution within British saltmarshes might be a result of being out-competed by *S. anglica* in the pioneer zone, but the relationship between these two species is still not fully clear. More directly, although a fairly robust perennial, its structure and function is under great pressure from a range of factors affecting all saltmarshes on the south and east coasts, in particular coastal squeeze (from sea level rise and changes in estuarine dynamics).

Accretion and development of saltmarsh is occurring on some parts of the British coastline, notably in north-west England where isostatic uplift largely negates sea level rise. However, this is outside the native range of *S. maritima* and, where sediments are appropriate, it is *S. anglica* that is taking advantage of the conditions.

S. alterniflora is characteristic of pioneer/low saltmarsh, but does not occur as low in the tidal frame as *S. anglica* can. In Southampton Water, now its only known locality, it is under great pressure, its extent having been reduced to a critically small area. This can be partly explained by past land claim. It has also been suggested that it has also lost out in competition with *S. anglica* (Rodwell 2000). However, although a robust perennial, its structure and function is also under great pressure from a range of factors affecting all saltmarsh in The Solent, in particular coastal squeeze (from sea level rise and changes in estuarine dynamics), and possibly pollution (Maskell and Raybould 2001).

It is probable that *S. x townsendii* fills the same niche as *S. anglica* that is primarily as a pioneer saltmarsh species thriving lower down the tidal frame than other species. However it appears to be at a competitive disadvantage with *S. anglica* – it is the latter that takes advantage of suitable conditions where they occur around the English and Welsh coasts. *S.* x *townsendii* may only be abundant locally in The Solent where it is experiencing the same adverse pressures on its structure and function as are *S. maritima* and *S. alterniflora*.

All these problems are reflected in 100% of SAC assessments for H1320 being classed as unfavourable declining.

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H1320. 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:

- 100% of the area and 100% of the number of assessments was unfavourable; and
- 100% of the total UK habitat area was in unfavourable condition.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H1320. 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	113	2
	No change		
	Unclassified		
	Recovering		
	Total	113	2
	% of all assessments	***100%***	***100%***
	% of total UK resource	***100%***	***unknown***
Favourable	Maintained		
	Recovered		
	Unclassified		
	Total		0
	% of all assessments	***0%***	***0%***
	% of total UK resource	***0%***	***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)/Area of Special Scientific Interest (ASSI) condition assessments

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

<table>
<tr><th colspan="3">Current Condition of H1320 based on CSM condition assessments (See Sections 4.2 and 7.2 for further information)</th></tr>
<tr><td>Map 4.2.1 SAC assessments</td><td>Map 4.2.2 Assessments strongly indicative of the condition on SSSI/ASSIs</td><td>Map 4.2.3 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 = 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</td><td colspan="2">Key*
Green – 80 – 100% of assessed features on 10-km square are favourable
Yellow - 50 – 80% of assessed features on 10-km square are favourable
Orange - 20 – 50% of assessed features on 10-km square are favourable
Red - 0 – 20% of assessed features on 10-km square are favourable
*This is the same key as was used for JNCC CSM Report 2006</td></tr>
</table>

4.3 Typical species

Typical species[2.5.3]: ***Spartina maritima***

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

In the UK the H1320 habitat is defined by the presence of large amounts of *S. maritima*, and *S. alterniflora*. The equivalent NVC communities have few other constituent species; and these few are typical saltmarsh plants, mainly of pioneer/low marsh.

S. maritima is classified as a 'Nationally scarce' plant in Britain (Stewart *et al.* 1994) and *S. alterniflora*, although not considered in national status reviews, is nationally rare. *S. maritima* showed a decline in occurrence across the UK during the last 25 years, but of less than 25% (see table below). The invasive and non-native competitor, *S. anglica*, showed an increase in occurrence across the UK during the last 25 years, but of less than 25%. Although *S. anglica* shows poor faithfulness to H1320 it has been included in this section as a negative indicator.

Table 4.3.1 Trends and faithfulness of selected typical species for H1320

Typical species	Faithfulness to habitat H1320 (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)
Spartina maritima	Very high	Significant decline, but <25% in 25 years
Spartina anglica	Low	Significant increase, but <25% in 25 years

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

Conclusion[2.6.iii]: **Unfavourable – Bad and deteriorating**

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 is in unfavourable condition.

Past losses of range and area have left current resource highly fragmented and isolated, and suffering from considerable adverse pressures – notably coastal squeeze, erosion, sediment dynamics, etc. The SACs supporting H1320, representing nearly all the habitat resource, are in unfavourable declining condition and typical species (i.e. *S. maritima*) are continuing to decline.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

- Protection within designated sites

All the resource of H1320 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 BAP

The habitat is covered by the *Coastal saltmarsh action plan* under the UK Biodiversity Action Plan (see 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 H1320 are listed below, several of which are referred to in Section 4.1. The related EC codes are shown in brackets.

- Erosion and 'coastal squeeze' (**900 erosion, 930 submersion**)

- Sediment dynamics (**851 modification of marine currents, 871 sea defence or coast protection works**)
- Land claim (**802 reclamation of land from sea, estuary or marsh**)
- Cord grass *Spartina anglica* (**954 invasion by a species, 971 competition**)
- Other human influences (**420 Discharges, 701 water pollution, 703 soil pollution, 730 Military manoeuvres, 810 Drainage, 840 Flooding**)
- Climate change (**900 erosion, 930 submersion, 950 Biocenotic evolution**)

Based on the literature review (see Technical note IV) climate change is considered a potentially significant threat to the future condition of this habitat especially in the long term. The main foreseen effect will be its contribution to erosion and coastal squeeze through increased sea-level rise and storminess.

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.

- 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 threat to the future condition of this habitat.

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 H1320 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 H1320 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:

- 0% of the area and 0% of the number of assessments fall within the future-favourable category; and
- 0% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H1320 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	113	2
	Unfavourable no change		
	Unfavourable unclassified		
	Total	113	2
	% of assessments	***100%***	***100%***
	% of total UK extent	***100%***	***Unknown***
Future-favourable	Favourable maintained		
	Favourable recovered		
	Unfavourable recovering		
	Favourable unclassified		
	Total		
	% of assessments	***00%***	***00%***
	% of total extent	***0%***	***Unknown***

Note that the scenario presented above is based on the same information as used to construct the Table in section 4.1. 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 H1320 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 10-km square are favourable
Yellow - 50 – 80% of assessed features on 10-km square are favourable
Orange - 20 – 50% of assessed features on 10-km square are favourable
Red - 0 – 20% of assessed features on 10-km 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 – Bad and deteriorating

The EC Guidance states that where "habitat prospects are bad, with severe impacts from threats expected and long-term viability not assured", the judgement should be Unfavourable – Bad. In the UK, this was generally taken to mean that habitat range and/or area are in decline, and/or less than 75% of the habitat area is likely to be in favourable condition in 12-15 years.

The analysis of data from SACs shows that 100% of the total UK habitat area will still remain unfavourable in future and that all of the resource is expected to be declining. The adverse pressures that have reduced the *Spartina* swards to their current parlous state will continue to threaten this habitat into the future. There is no indication that range, area and condition of H1320 will improve. The SACs supporting H1320, representing nearly all the habitat resource, are predicted to remain in unfavourable declining condition. However, it should be noted that a number of positive conservation measures – notably the agreed BAP target for creating of 350 ha of saltmarsh per annum – have been put into place to improve the status of this habitat, although the BAP habitat also includes H1310, H1330 and H1420. However, it is considered that recreation will take time for the new intertidal habitat to be colonised and for the habitat to reach maturity. Furthermore, *S. maritima* is a southern species and northerly realignments will be outside its natural range. Its lack of seeding and the competition with *S. anglica* means that it may have to be planted so that it is able to take adequate advantage of future managed realignments, and natural breaches, of coastal flood defences. Despite progress already made and some additional recovery once further conservation measures are put into place, the expectation is that more 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 and deteriorating

All parameter conclusions are Unfavourable – Bad and deteriorating.

Table 6.1 Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Unfavourable – Bad and deteriorating	Range has declined by at least 1% per annum between 1987 and 1999.	1
Area covered by habitat type within range	Unfavourable – Bad and deteriorating	Current extent is decreasing, is considered to be more than 10% below the favourable reference area.	2
Specific structures and functions (including typical species)	Unfavourable – Bad and deteriorating	More than 25% of the habitat area is considered to be unfavourable as regards its specific structures and functions. Significantly more of the resource in unfavourable condition is declining than improving.	1
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Bad and deteriorating	Habitat prospects over next 12-15 years considered to be bad, with severe impact from threats expected and long term viability not assured. Further measures are required to address threats to future range, extent and structure and function for the overall UK resource.	1
Overall assessment of	Unfavourable – Bad and deteriorating	All parameter conclusions are Unfavourable – Bad and deteriorating.	1

conservation status			

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

7. Annexed material **(including information sources used 2.2)**

7.1 References

AGER, J., HERBERT, R., POPE, C. & RILEY, A. 1999. *Spartina maritima in the Solent: current status and distribution with special reference to the population at Newtown Harbour, Isle of White.* Medina Valley Centre report to English Nature.

AIR POLLUTION INFORMATION SYSTEM. 2004. www.apis.ceh.ac.uk

CLAPHAM, A.R., TUTIN, T.G. & WARBURG, E.F. 1962. *Flora of the British Isles.* Cambridge University Press. Cambridge.

GRAY, A.J., RAYBOULD, A.F. & HORNBY, D. 1999. *Solent Spartina survey. A survey of the non-Spartina anglica species in the Solent.* CEH report to English Nature, EN/NERC contract FIN/T98/05.

HAINES-YOUNG, R.H. *et al.* 2000. *Accounting for nature: assessing habitats in the UK countryside.* DETR, Rotherham.

HUBBARD, J.C.E. & STEBBINGS, R.E. 1967. Distribution, dates of origin and acreage of Spartina townsendii (s. l.) marshes in Great Britain. *Proceedings of the Botanical Society of the British Isles* **7**: 1-7.

JACKSON, D.L. & MCLEOD, C.R. (eds.) 2002. Handbook on the UK status of EC Habitats Directive interest features: provisional data on the UK distribution and extent of Annex I habitats and the UK distribution and population size of Annex II species. *JNCC Report* No. 312. Version 2. www.jncc.gov.uk/page-2447

JOINT NATURE CONSERVATION COMMITTEE. 2005. *Common Standards Monitoring (CSM).* Joint Nature Conservation Committee, Peterborough www.jncc.gov.uk/page-2217

MARCHANT, C.J. & GOODMAN, P.J. 1969. Spartina alterniflora Loisel. Biological Flora of the British Isles. *Journal of Ecology* **57**: 291-295.

MASKELL, L., ALEXANDER, M. & BOND, J. 2002. *The distribution of Spartina spp between Hythe and Calshot.* CEH report to English Nature.

MASKELL, L.C. & RAYBOULD, A.F. 2000. *The status of Spartina alterniflora in Southampton Water.* CEH report to English Nature, EN/NERC contract VK5119/522/UG0914.

MASKELL, L.C. & RAYBOULD, A.F. 2001. The decline of Spartina alterniflora (Poaceae) in the British Isles. *Watsonia* **23**: 391-400.

MCLEOD, C.R., YEO, M., BROWN, A.E., BURN, A.J., HOPKINS, J.J. & WAY, S.F. (eds.) 2007. *The Habitats Directive: selection of Special Areas of Conservation in the UK.* 2nd edn. Joint Nature Conservation Committee, Peterborough www.jncc.gov.uk/SACselection

POSFORD HASKONING. 2002. Essex Coast and Estuaries Coastal Habitat Management Plan (CHaMP). Final Report to English Nature.

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. (eds.) 2002. *New Atlas of the British & Irish Flora*. Oxford University Press.

RAYBOULD, A.F., GRAY, A.J., LAWRENCE, M.J. & MARSHALL, D.F. 1991. The evolution of Spartina anglica C. E. Hubbard (Gramineae): variation and status of the parental species in Britain. *Biological Journal of the Linnean Society* **44**: 369-380.

RODWELL, J.S. (ed.) 2000. *British Plant Communities. Volume 5 Maritime communities and vegetation of open habitats*. Cambridge University Press.

STEWART, A., PEARMAN, D.A. & PRESTON, C.D. 1994. *Scarce Plants in Britain*. Peterborough, Joint Nature Conservation Committee.

UKBAP website; www.ukbap.org.uk

Map data sources

JNCC International Designations Database. Joint Nature Conservation Committee.

New atlas of the British and Irish flora. Oxford University Press, Oxford.

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)	2
Number of SACs with CSM assessments (b)	2
% of SACs assessed (b/a)	100
Extent of feature in the UK – hectares (c)	113
Extent of feature on SACs – hectares (d)	113
Extent of features assessed – hectares (e)	113
% of total UK hectarage on SACs (d/c)	100
% of SAC total hectarage that has been assessed (e/d)	100
% of total UK hectarage that has been assessed (e/c)	100

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)	2	100%
Current – Favourable (green)		%
On SAC but not assessed (blue)		%
Not on SAC (transparent)		%
Total Number of 10-km squares (any colour)	2	
Future – Unfavourable (red)	2	100%
Future – Favourable (green)		%