

**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 :  
H7140: Transition mires and quaking bogs**

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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# H7140 Transition mires and quaking bogs

*Audit trail compiled and edited by JNCC and the UK statutory nature conservation agencies Lowland Wetland Lead Co-ordination 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 H7140 and its relations with UK classifications.

**Table 1.1.1** Summary description of habitat H7140 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
<b>EU Interpretation Manual</b>	<p>Peat-forming communities developed at the surface of oligotrophic to mesotrophic waters, with characteristics intermediate between soligenous and ombrogenous types. They present a large and diverse range of plant communities. In large peaty systems, the most prominent communities are swaying swards, floating carpets or quaking mires formed by medium-sized or small sedges, associated with sphagnum or brown mosses. They are generally accompanied by aquatic and amphibious communities.</p> <p>In the Boreal region this habitat type includes minerotrophic fens that are not part of a larger mire complex, open swamps and small fens in the transition zone between water (lakes, ponds) and mineral soil.</p> <p>These mires and bogs belong to the <i>Scheuchzerietalia palustris</i> order (oligotrophic floating carpets among others) and to the <i>Caricetalia fuscae</i> order (quaking communities). Oligotrophic water-land interfaces with <i>Carex rostrata</i> are included.</p>	<p>The UK definition includes some examples of lagg zone habitat in this Annex I habitat.</p>

<p><b>NVC</b></p>	<p>M4 <i>Carex rostrata</i> – <i>Sphagnum recurvum</i> mire  M5 <i>Carex rostrata</i> – <i>Sphagnum Squarrosus</i> mire  M8 <i>Carex rostrata</i>- <i>Sphagnum warnstorffii</i> mire  M9 <i>Carex rostrata</i> – <i>Calliergon cuspidatum/giganteum</i> mire  S27 <i>Carex rostrata</i> – <i>Potentilla palustre</i> tall herb fen</p>	<p>This list is not exhaustive: forms of M2 <i>Sphagnum cuspidatum/recurvum</i> bog pool community, M14 <i>Schoenus nigricans</i> – <i>Narthecium ossifragum</i> mire and M29 <i>Hypericum elodes</i> – <i>Potamogeton polygonifolius</i> soakway are also important components on some sites. Forms (in predominantly topogenous contexts) of M15 are regarded as conforming to this habitat as many such examples appear developmentally and floristically intermediate between fen and bog.</p> <p>Not all examples of M9 <i>Carex</i> – <i>Calliergon</i> mire belong to this Annex I type; where it occurs in more base-rich conditions or in association with other rich fen communities, it may be referable to 7230 Alkaline fens, or, in stands where great fen-sedge <i>Cladium mariscus</i> is present, to 7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>.</p>
<p><b>BAP priority habitat type</b></p>	<p>Blanket bog (partial); fens (partial)</p>	<p>Overlaps with both types.</p>
<p><b>CSM reporting categories</b></p>	<p><u>England</u>  Fen, marsh and swamp (Lowland)</p> <ul style="list-style-type: none"> <li>• Bogs</li> <li>• Fen marsh and swamp</li> </ul> <p>Fen, marsh and swamp (upland)</p> <ul style="list-style-type: none"> <li>• Fen, marsh and swamp</li> </ul> <p><u>Scotland</u>  Fen, marsh and swamp (lowland)</p> <ul style="list-style-type: none"> <li>• Basin fen</li> <li>• Basin fen, schwing moor type</li> <li>• Flood plain fen</li> <li>• Hydromorphological mire range</li> <li>• Laggs of raised bog</li> <li>• Open water transition fen</li> <li>• Transition grassland</li> <li>• Valley fen</li> </ul> <p>Fen, marsh and swamp (upland)</p> <ul style="list-style-type: none"> <li>• Basin fen</li> <li>• Flood-plain fen</li> </ul> <p><u>Northern Ireland</u>  Fen, marsh and swamp (lowland)</p> <ul style="list-style-type: none"> <li>• Fens</li> <li>• Lowland fen</li> </ul>	

The term ‘transition mire’ relates to vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and 7230 Alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich. The vegetation normally has intimate mixtures of species considered to be acidophile and others thought of as calciphile or basophile. In some cases the mire occupies a physically transitional location between bog and fen vegetation, as for example on the marginal lagg of raised bog or associated with certain valley and basin mires. In other cases these

intermediate properties may reflect the actual process of succession, as peat accumulates in groundwater-fed fen or open water to produce rainwater-fed bog isolated from groundwater influence. Many of these systems are very unstable underfoot and can therefore also be described as ‘quaking bogs’.

Transition mires and quaking bogs can occur in a variety of situations, related to different geomorphological processes: in flood plain mires, valley bogs, basin mires and the lagg zone of raised bogs, and as regeneration surfaces within mires that have been cut-over for peat or areas of mineral soil influence within 7130 Blanket bogs (e.g. ladder fens).

Transition mires and quaking bogs are a widespread but local habitat type in the UK. It has a predominantly northern and western distribution, but with important stronghold areas in the New Forest and East Anglia. This is an ecologically variable habitat that occurs in a wide range of hydro-morphological contexts.

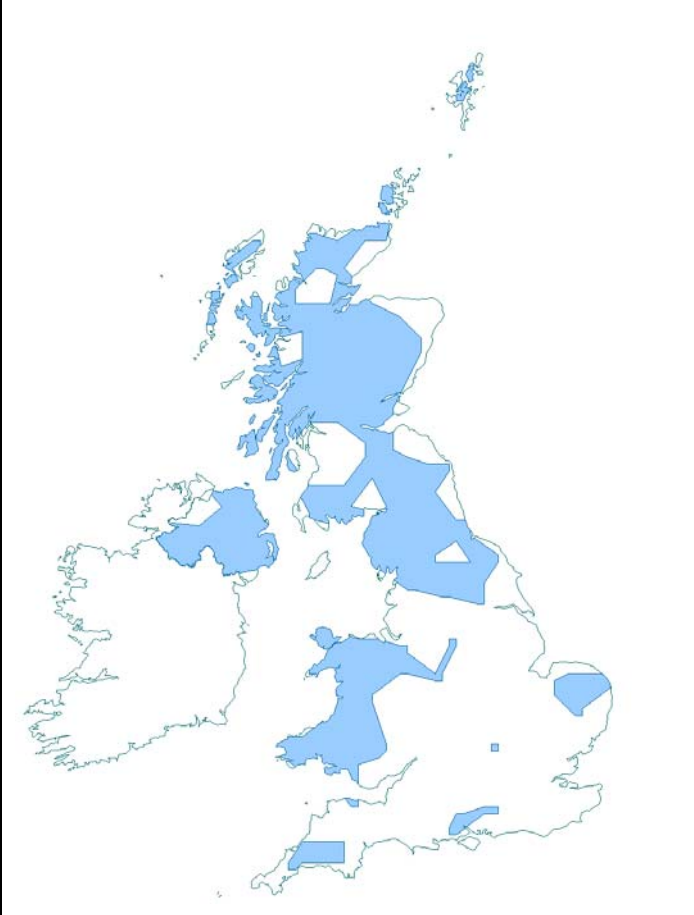
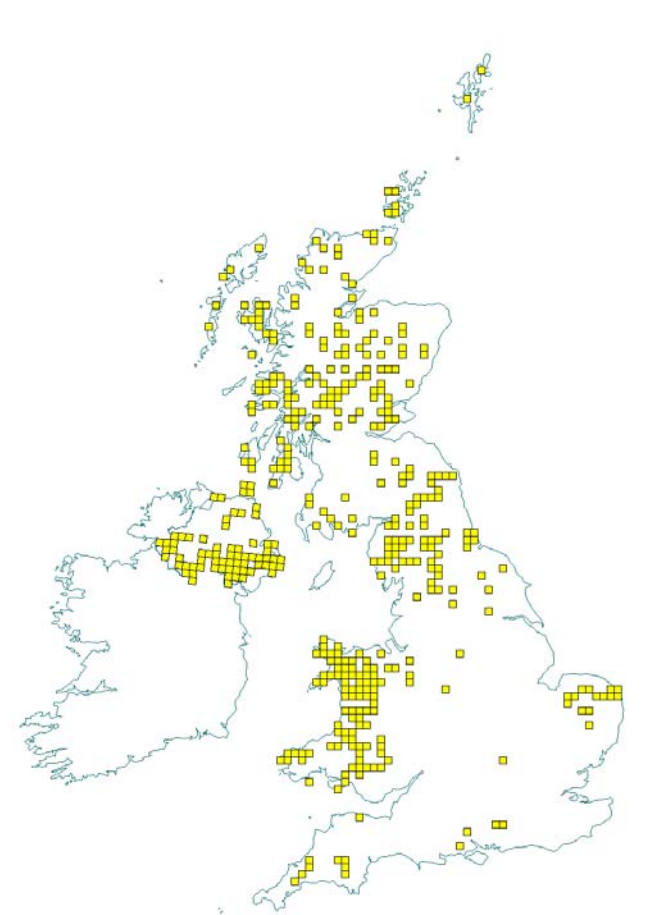
## 2. Range <sup>2.3</sup>

### 2.1 Current range

Range surface area <sup>2.3.1</sup>: **113,820 km<sup>2</sup>**

Date calculated <sup>2.3.2</sup>: **May 2007**

Quality of data <sup>2.3.3</sup>: **Moderate**

Map 2.1.1 Habitat range map <sup>1.1</sup> for H7140	Map 2.1.2 Habitat distribution map <sup>1.2</sup> for H7140
	
<p>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).</p>	<p>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: 413</p>

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 was clipped to include inland areas only. Maps 2.1.1 and 2.1.2 show the range and distribution of H7140 in the UK.

Transition mires and quaking bogs are a widespread but local habitat type in the UK that is ecologically variable and occurs in a wide range of geomorphological contexts. Map 2.1.1 gives a good outline of the overall UK distribution of this habitat, but probably under-records density in its northern and western strongholds. Some over-recording of the habitat is also possible because the map is based on the component NVC communities judged to conform to this habitat, rather than confirmed examples of the habitat itself. The predominantly NW distribution of this habitat reflects (i) the main concentrations of base-poor rocks, (ii) areas of moderate – high rainfall and (iii) extensive areas of undulating upland fringe landscape: the frequent interaction between these three attributes gives rise to the largest number of potential niches for this habitat. Important examples or concentrations of this habitat occur outside this broad zone, chiefly as a result of favourable combinations of local superficial geology and water supply mechanism.

## 2.2 Trend in range since c.1994

<b>Trend in range<sup>2.3.4</sup>:</b>	<b>Unknown</b>
<b>Trend magnitude<sup>2.3.5</sup>:</b>	<b>Not applicable</b>
<b>Trend period<sup>2.3.6</sup>:</b>	<b>1994-2006</b>
<b>Reasons for reported trend<sup>2.3.7</sup>:</b>	<b>Not applicable</b>

There is no readily available evidence or information on trends in range for H7140 since 1994.

## 2.3 Favourable reference range

**Favourable reference range<sup>2.5.1</sup>:** **113,800km<sup>2</sup>**

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, 113,800km<sup>2</sup>, has been set as the favourable reference area. Reasons for this are discussed below.

In spite of the obvious NW bias in its distribution, the potential range of this habitat probably extends across the majority of the UK land-mass, although the number of potential sites suitable for it become progressively less frequent south-east of the Severn-Humber line. These districts lack the generally humid climate and base-poor geology of the NW, and in this area the habitat becomes progressively more dependent on generally infrequent local combinations of suitable geology and hydrology, notably base desaturated fluvio-glacial sands and gravels.

There is no information on the historic range of this habitat.

The current distribution of H7140 appears to occupy most of the potential range. The current range as shown on Map 2.1.1 is quite extensive but naturally limited by climatic, geomorphological and hydrological conditions. These requirements also mean that, when combined with past human impacts, the resource has a fragmented distribution within its range, particularly in the lowlands.

Overall the current range is thought to be close to the favourable reference range.

## 2.4 Conclusions on range

**Conclusion<sup>2.6.i</sup>:** **Favourable**

There is no information on any changes in range for H7140 since 1994, nor any previous historical data on extent or changes. However, the current range is considered to be close to potential range for the habitats and hence to its favourable reference range; and so the judgement on range for H7140 is Favourable.

### 3. Area <sup>2.4</sup>

#### 3.1 Current area

<b>Total UK extent <sup>2.4.1</sup>:</b>	<b>&gt;29.07km<sup>2</sup></b>
<b>Date of estimation <sup>2.4.2</sup>:</b>	<b>May 2007</b>
<b>Method <sup>2.4.3</sup>:</b>	<b>1 = only or mostly based on expert opinion</b>
<b>Quality of data <sup>2.4.4</sup>:</b>	<b>Poor</b>

Table 3.1.1 provides information on the area of H7140 in the UK.

Although regarded as widespread, there is no comprehensive data available for the extent of this habitat type in the UK outside of Special Areas of Conservation (SACs), largely due to difficulties in accurate definition and delineation of this transitional habitat. However the known area of H7140 on UK SACs has been estimated at 2,907 ha. In the absence of any other figures this figure has been used as a minimum value for the total extent of H7140 in the UK; expert opinion is that the actual UK total of the resource will exceed this figure.

**Table 3.1.1** Area of H7140 in the UK

	<b>Area (ha)</b>	<b>Method <sup>2.4.3</sup></b>	<b>Quality of data <sup>2.4.4</sup></b>
<b>England</b>	Unknown	1	Poor
<b>Scotland</b>	Unknown	1	Poor
<b>Wales</b>	Unknown	1	Poor
<b>Northern Ireland</b>	Unknown	1	Poor
<b>Total UK extent <sup>2.4.1</sup></b>	> 2907 ha	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

<b>Trend in area <sup>2.4.5</sup>:</b>	<b>Unknown</b>
<b>Trend magnitude <sup>2.4.6</sup>:</b>	<b>Not applicable</b>
<b>Trend period <sup>2.4.7</sup>:</b>	<b>1994-2006</b>
<b>Reasons for reported trend <sup>2.4.8</sup>:</b>	<b>Not applicable</b>

There is no information on UK trends for H7140 since 1994.

#### 3.3 Favourable reference area

<b>Favourable reference area <sup>2.5.2</sup>:</b>	<b>Unknown</b>
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There is no information on the historic area or trends in area for H7140, in part due to the difficulties of defining this habitat accurately.

Historically the overall trend in area for H7140 is thought to be one of contraction because of (i) direct habitat destruction, (ii) successional loss to woodland, and (iii) various forms of habitat degradation resulting from cultural enrichment, habitat neglect, drainage and (locally) abstraction. However, there is no quantitative information available to confirm this trend nor, particularly given the absence of any data on current or 1994 extent of H7140, to suggest how this might relate to favourable reference area.

#### 3.4 Conclusions on area covered by habitat

<b>Conclusion <sup>2.6.ii</sup>:</b>	<b>Unknown</b>
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Outside of SACs, the current area of H7140 is not known in the UK. There is no information on any trends in area (including since 1994), or on the historic area of the habitat. In the absence of this information, the conclusion for the area parameter for H7140 is Unknown.

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

### **4.1 Main pressures** <sup>2.4.10</sup>

The following list has been derived from the six year Common Standards Monitoring (CSM) results for SACs designated for their representation of H7140 and results from the 2005 UK Biodiversity Action Plan (BAP) reporting (see <http://www.ukbap.org.uk/GenPageText.aspx?id=104> for further details):

- **Water abstraction (810 Drainage, 890 Other human induced changes in hydraulic conditions)**  
Past and continuing loss of area by drainage and conversion to intensive agriculture has led to past losses of H7140. Excessive water abstraction from aquifers has dried up or reduced spring line flows, and generally lowered water tables. Abstractions also have affected the natural balance between the differing water qualities of ground water and surface water.

- **Grazing (140 Grazing)**  
Both under and over-grazing have been recorded as reasons for adverse condition of H7140 in the SAC series.

- **Fragmentation (990 Other natural processes)**  
Small total area of habitat and critically small population sizes of several key species dependent on H7140 are also major pressures on the habitat.

- **Absence of or inappropriate management (141 Abandonment of pastoral systems)**  
Lack of or inappropriate management of existing fens leads to drying, scrub encroachment and succession to woodland.

- **Pollution (701 Water pollution)**  
Valley fens are particularly susceptible to agricultural run-off within the catchment. Enrichment or hypertrophication can result in substantial adverse changes to key plant communities.

- **Air pollution (702 Air pollution)**  
Based on an assessment of the exceedence of relevant critical loads (see Technical Note III), air pollution is considered to be a potentially significant pressure to the structure and function of this habitat.

## **4.2 Current condition**

### **4.2.1 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 H7140 in the UK. The following attributes were examined for all CSM assessments relevant to the habitat:

- Extent.
- Composition (habitat and vegetation).
- Structure.
- Positive and negative indicator species.
- 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 H7140. 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:

- 42% of the area and 62% of the number of assessments was unfavourable; and
- an unknown amount of the total UK habitat area was in unfavourable condition.

**Table 4.2.1** CSM condition assessment results for UK SACs supporting H7140. 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	543	7
	No change	335	5
	Unclassified	31	4
	Recovering	275	8
	Total	1,184	24
	<i>% of all assessments</i>	<b>42%</b>	<b>62%</b>
	<i>% of total UK resource</i>	<b>unknown%</b>	<b>unknown</b>
Favourable	Maintained	1,266	10
	Recovered		
	Unclassified	388	5
	Total	1,654	15
	<i>% of all assessments</i>	<b>58%</b>	<b>38%</b>
	<i>% of total UK resource</i>	<b>unknown%</b>	<b>unknown</b>

#### 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 March 2005, as used for the JNCC Common Standards Monitoring Report 2006.

### Site of Special Scientific Interest (SSSI)/Area 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:

- 64% of strongly indicative assessments and 43% weakly indicative assessments were unfavourable.

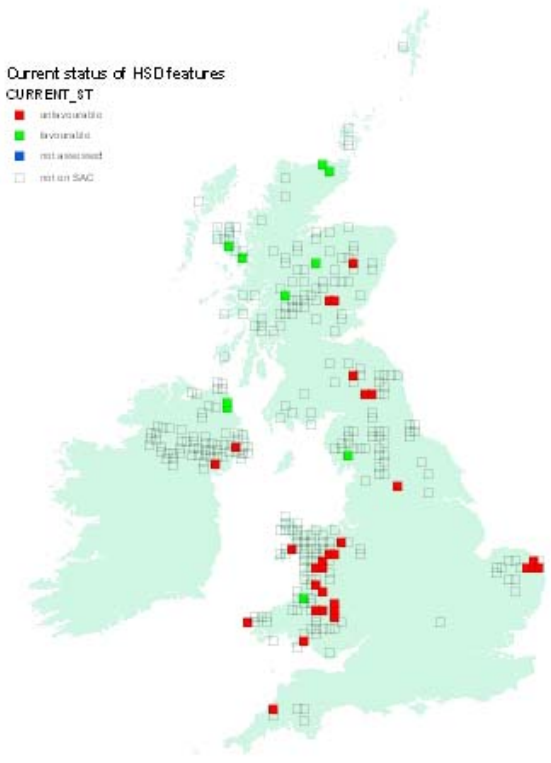
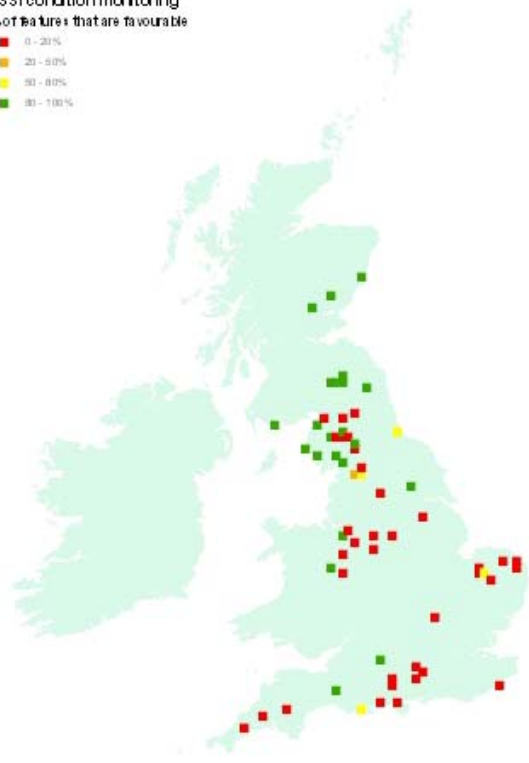
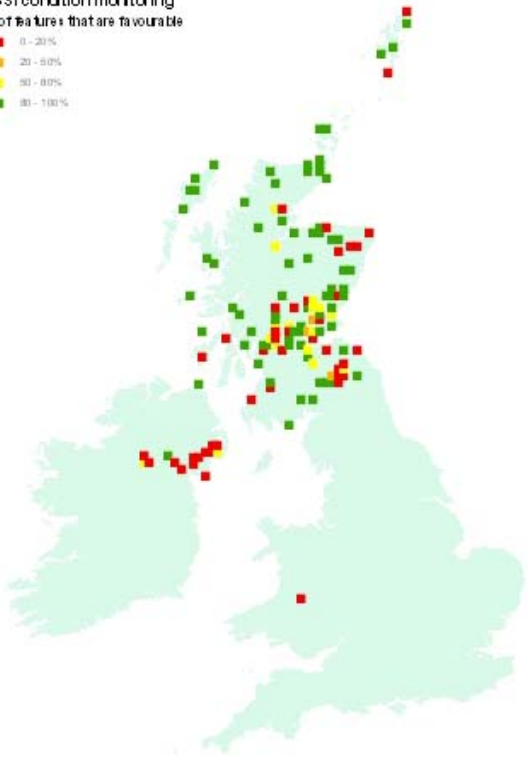
**Table 4.2.2** CSM condition assessment results for UK SSSI/ASSIs that were judged to be either strongly or weakly indicative of the condition of H7140 on SSSI/ASSIs. See notes below table and Technical Note II for further details

Condition	Condition sub-categories	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
<b>Unfavourable</b>	Declining	11	23
	No change	21	21
	Unclassified		18
	Recovering	22	2
	Total	54	64
	<i>% of all assessments</i>	<b>64%</b>	<b>43%</b>
<b>Favourable</b>	Maintained	8	79
	Recovered		
	Unclassified	23	5
	Total	31	84
	<i>% of all assessments</i>	<b>36%</b>	<b>57%</b>

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 H7140 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
 <p>Current status of HSD features CURRENT_ST</p> <ul style="list-style-type: none"> <li>■ unfavourable</li> <li>■ favourable</li> <li>■ not assessed</li> <li>□ not on SAC</li> </ul>	 <p>SSSI condition monitoring % of features that are favourable</p> <ul style="list-style-type: none"> <li>■ 0 - 20%</li> <li>■ 20 - 50%</li> <li>■ 50 - 80%</li> <li>■ 80 - 100%</li> </ul>	 <p>SSSI condition monitoring % of features that are favourable</p> <ul style="list-style-type: none"> <li>■ 0 - 20%</li> <li>■ 20 - 50%</li> <li>■ 50 - 80%</li> <li>■ 80 - 100%</li> </ul>
<p>Key</p> <p><b>Red</b> = unfavourable, i.e. the square contains at least one SAC where this habitat feature is present and has been judged to be unfavourable</p> <p><b>Green</b> = 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</p> <p><b>Blue</b> = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported</p> <p><b>Transparent</b> = SAC feature not present, i.e. the square does not contain any SAC features of this habitat type</p>	<p>Key*</p> <p><b>Green</b> – 80 – 100% of assessed features on 10km square are favourable</p> <p><b>Yellow</b> - 50 – 80% of assessed features on 10km square are favourable</p> <p><b>Orange</b> - 20 – 50% of assessed features on 10km square are favourable</p> <p><b>Red</b> - 0 – 20% of assessed features on 10km square are favourable</p> <p>*This is the same key as was used for JNCC CSM Report 2006</p>	

### 4.3 Typical species

Typical species<sup>2.5.3</sup>: *Lysimachia thyrsoiflora*

Typical species assessment<sup>2.5.4</sup>: **Change in 10 km square occupancy across UK over last 25 years**

The trends of the following typical species are considered to indicative or informative on the structure and function of the UK resource of H7140.

**Table 4.3.1** Trends and faithfulness of selected typical species for H7140

Typical species considered:	Faithfulness to habitat H7140 (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 <a href="http://www.jncc.gov.uk/page-3254">http://www.jncc.gov.uk/page-3254</a> )
<i>Lysimachia thyrsoiflora</i>	Medium	Significant increase, but less than 25% in 25yrs

None of the other species listed as characteristic of this habitat in the EU Interpretation Manual are particularly faithful to this habitat so available trend data at the UK-level is not particularly meaningful and has not been utilised here. Overall the trend for this species suggests an improvement in the condition of the wider resource of H7140; however there are no trends for the species since 1994 and limitations to deducing a trend for a habitat from a single species.

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

Conclusion<sup>2.6.iii</sup>: **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.

CSM data for 2000-2006 for SACs and particularly SSSIs suggest high proportions (at least 42%) of statutory sites supporting H7140 are unfavourable. Around 10% of the assessed SAC area is recovering but around 21% is declining, suggesting a net decline in the condition of H7140 in these sites. In the absence of any estimate of the total area of the habitat in the UK, this figure has been extrapolated as being representative of the UK resource overall and this suggests that much more than 25% of the UK area for H7140 is in unfavourable condition. Furthermore with almost twice as much of the assessed resource declining as recovering, this suggests a judgement of Unfavourable – Bad and deteriorating for the structure and function parameter for H7140.

## 5. Future prospects

### 5.1 Main factors affecting the habitat

#### 5.1.1 Conservation measures

- Protection within SACs

A significant proportion of the current resource 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. An unknown but significant proportion of the resource of H7140 also lies within the SSSI/ ASSI series where similar management measures are in place.

- Agri-environment measures

A suite of agri-environment measures are now in place in both the uplands and lowlands which are addressing more appropriate management, particularly grazing levels, for an unknown proportion of the resource of H7140 outside the statutory site series.

- Water Framework Directive (WFD)

In addition to the drive for improvement generated by the SAC and SSSI network, the WFD is adding considerable impetus for widespread action issues such as abstraction licences, and pollution.

- UK Biodiversity Action Plan (BAP)

The habitat is covered by both the blanket bog and fens action plans 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 corresponding to H7140.

### 5.1.2 Main future threats<sup>2.4.11</sup>

The most obvious major future threats to H7140 are listed below, several of which are referred to in Section 4.1. The measures identified in Section 5.1.1 are addressing some of these factors, with a greater proportion being addressed within the statutory site series:

- Water abstraction (**810 Drainage, 890 Other human induced changes in hydraulic conditions**)
- Grazing (**140 Grazing**)
- Fragmentation (**990 Other natural processes**)
- Absence of or inappropriate management (**141 Abandonment of pastoral systems**)
- Pollution (**701 Water pollution**)

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

Based on an assessment of the exceedence of relevant critical loads (see Technical Note III), air pollution is considered to be a potentially significant threat to the future condition of this habitat.

- Climate change (**750 Other pollution or human impacts/ activities**)

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<sub>2</sub> 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.

Although the potential range of this habitat is presently wide, climate change is expected to cause a northern migration of its bioclimatic envelope in the longer term (i.e. beyond 15-20 years hence).

## 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 H7140 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 H7140 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:

- 68% of the area and 59% of the number of assessments fall within the future-favourable category; and
- An unknown proportion of the total UK habitat area falls within the future-favourable category.

### SSSI/ASSI condition assessments

Table 5.2.2 and Maps 5.2.2 and 5.2.3 summarise the predicted potential future condition of H7140 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:

- 62% of strongly indicative assessments and 58% weakly indicative assessments fall within the future-favourable category.

**Table 5.2.1** Predicted future condition of UK SACs supporting H7140 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
<b>Future-unfavourable</b>	Unfavourable declining	543	7
	Unfavourable no change	335	5
	Unfavourable unclassified	31	4
	Total	909	16
	<i>% of assessments</i>	<b>32%</b>	<b>41%</b>
	<i>% of total UK extent</i>	<b>unknown%</b>	<b>Unknown</b>
<b>Future-favourable</b>	Favourable maintained	1,266	10
	Favourable recovered		
	Unfavourable recovering	275	8
	Favourable unclassified	388	5
	Total	1,929	23
	<i>% of assessments</i>	<b>68%</b>	<b>59%</b>
	<i>% of total extent</i>	<b>unknown%</b>	<b>Unknown</b>

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:

- the unfavourable-recovering condition assessments will at some point in the future become favourable;
- all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
- 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 H7140 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

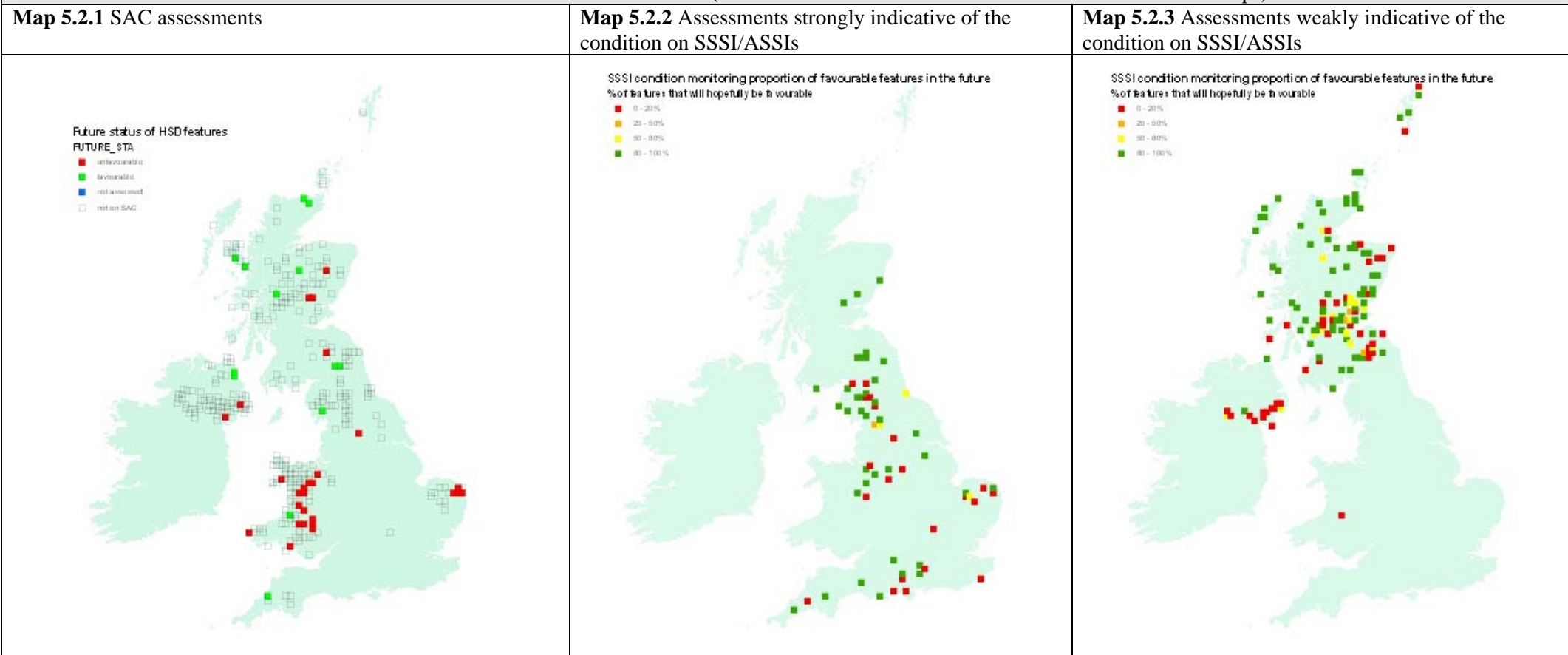
Future condition	Present condition	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
<b>Future-unfavourable</b>	Unfavourable declining	11	23
	Unfavourable no change	21	21
	Unfavourable unclassified		18
	Total	<b>32</b>	<b>62</b>
	<i>% of assessments</i>	<b>38%</b>	<b>42%</b>
<b>Future-favourable</b>	Favourable maintained	8	79
	Favourable recovered		
	Unfavourable recovering	22	2
	Favourable unclassified	23	5
	Total	53	86
	<i>% of assessments</i>	<b>62%</b>	<b>58%</b>

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.

**Predicted Future Condition of H7140 based on CSM condition assessments** (See Sections 5.2 and 7.2 for further information on these maps)



**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<sup>2.6.iv</sup>: Unfavourable – Bad**

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.

Many of the future threats and pressures (particularly grazing; lack of or inappropriate management; over-abstraction; and aquatic pollution) on H7140 are being addressed for the unknown proportion of the resource within the statutory site series; and (through WFD, agri-environment measures and similar positive management) for an unknown proportion of the resource of H7140 lying outside the statutory site series. However, even within the SAC series 32% of the area or 41% of assessed features (and in SSSIs/ASSIs, between 38% and 42 % of assessed features) of H7140 is likely to remain unfavourable. Extrapolating beyond the statutory site series this suggest that more than 25% of the overall UK resource will be in unfavourable condition in the immediate future (the next 15-20 years).

Whilst there are prospects for further control of some of the future threats through extension of existing mechanisms, others (particularly pollution and – to a lesser extent given the focus on the next 10-15 years – climate change) are less readily addressed. Although there is no evidence to suggest a future decline in either the range or area of H7140 in the UK by more than 1% p.a., the evidence from future favourability from CSM suggest that a substantial but unknown proportion of the total resource of H7140 is likely to remain in poor condition.

Although there are positive measures proposed for H7140, the conclusion reached is Unfavourable – Bad.

### **6. Overall conclusions and judgements on conservation status<sup>2.6</sup>**

#### **Conclusion<sup>2.6</sup>: Unfavourable – Bad and deteriorating**

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

**Table 6.1** Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Favourable	Range is stable and not less than the favourable reference range.	3
Area covered by habitat type within range	Unknown	Insufficient information to make a judgement.	3
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.	3
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Bad	Habitat prospects over next 12-15 years considered to be bad, with severe impact from threats expected and long term viability not assured. Measures are in place and planned to address threats to future range, extent and structure and function for the overall UK resource.	3
Overall assessment of conservation status	Unfavourable – Bad and deteriorating	Two parameters judged as Unfavourable – Bad, one trend as deteriorating.	3

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

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

### 7.1 References

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](http://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](http://www.jncc.gov.uk/page-2217)

#### Map data sources

Coastal vegetation survey of Northern Ireland. 1992. University of Lancaster, Unit of Vegetation Science.

JNCC International Designations Database. Joint Nature Conservation Committee.

Peatland Survey. 1988. Environmental Heritage Service & Queens University Belfast.

SNH Uplands Database, (18-12-98) 10KMVEG.XLS. Scottish Natural Heritage.

## 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

<b>Data</b>	<b>Value</b>
Number of SACs supporting feature (a)	41
Number of SACs with CSM assessments (b)	39
% of SACs assessed (b/a)	95
Extent of feature in the UK – hectares (c)	
Extent of feature on SACs – hectares (d)	2,907
Extent of features assessed – hectares (e)	2,838
% of total UK hectareage on SACs (d/c)	
% of SAC total hectareage that has been assessed (e/d)	98
% of total UK hectareage that has been assessed (e/c)	

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

<b>Status</b>	<b>Number of squares</b>	<b>Proportion of all squares</b>
Current – Unfavourable (red)	30	9%
Current – Favourable (green)	10	3%
On SAC but not assessed (blue)		%
Not on SAC (transparent)	278	87%
Total Number of 10km squares (any colour)	318	
Future – Unfavourable (red)	27	8%
Future – Favourable (green)	13	4%