

**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 :
H1340: Inland salt meadows**

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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H1340 Inland salt meadows

Audit trail compiled and edited by JNCC and the UK statutory nature conservation agencies Lowland Grassland 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 H1340 and its relations with UK classifications.

Inland salt meadows refer to non-coastal sites supporting saltmarsh vegetation. In the UK this vegetation corresponds to NVC types SM16 *Festuca rubra* salt-marsh community and SM23 *Spergularia marina* – *Puccinellia distans* salt-marsh community.

The Annex I type comprises only near-natural and not anthropogenic stands found, for example, in former salt-working sites and only natural examples of the habitat were considered for Special Area of Conservation (SAC) selection. This is based on guidance in the *EU Interpretation Manual* which states that artificial or partly artificial sites should only be considered where they harbour a species listed in Annex II of the Directive, or where there are no remaining natural (primary) examples of the the habitat at regional or national level.

Table 1.1.1 Summary description of habitat H1340 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
EU Interpretation Manual	Continental salt meadows (<i>Puccinellietalia distantis</i>) PAL. CLASS 15.4	
NVC	SM16 <i>Festuca rubra</i> salt-marsh community (Juncetum gerardi). SM23 <i>Spergularia marina</i> – <i>Puccinellia distans</i> salt marsh community.	In coastal situations, SM16 is widespread, particularly on western coasts, although rare in the south-east. There is only one confirmed inland locality for this salt-marsh community. Fragmentary stands occur on coastal marshes throughout the country and inland in both natural and anthropogenic situations, particularly in Cheshire and Staffordshire.
BAP priority habitat type	H1340 does not form part of a BAP priority habitat.	
CSM reporting categories	For SAC’s, the corresponding Annex I habitat is identified, i.e. 1340. For ASSI/SSSIs the closest corresponding feature categories as used for 2006 reporting in England are: Level 1 feature = H25 Inland salt marshes Main habitat category = Neutral grassland – lowland. Not present in Wales, Scotland or Northern Ireland.	

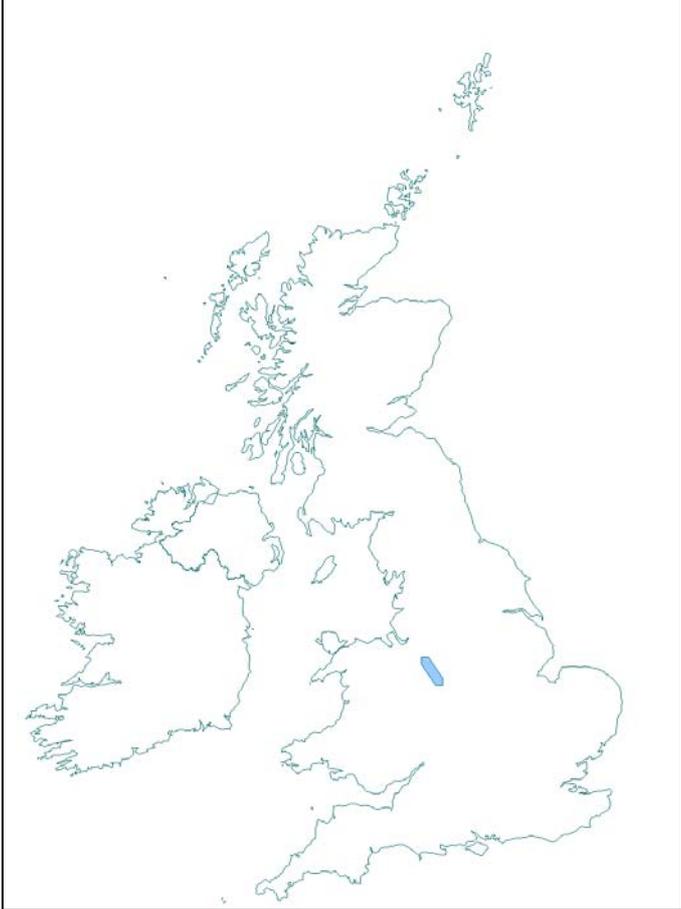
2. Range ^{2.3}

2.1 Current range

Range surface area ^{2.3.1}: 600km²
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 was clipped to include inland areas only.

Maps 2.1.1 and 2.1.2 show the range and distribution of H1340 in the UK.

Map 2.1.1 Habitat range map ^{1.1} for H1340	Map 2.1.2 Habitat distribution map ^{1.2} for H1340
	
<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: 2</p>

See Section 7.1 for map data sources

The natural range of this habitat in the UK is in central and north-west England and is determined primarily by geology and topography which give rise to natural brine springs. It is conceivable, but probably unlikely, that there are extant sites which are not known about. Inland salt meadows are a very rare habitat type in the UK: only two surviving natural inland salt meadows are known, one in Staffordshire the other in Cheshire.

The habitat was probably always rather rare depending as it does on the occurrence of natural brine springs. The latter are restricted as they depend on the occurrence of evaporite Saliferous beds of Triassic and Permian age near the surface. The former fall within the Mercia Mudstone group. Some older County

floras (Cheshire, Staffordshire, Gloucestershire, Worcestershire, North Yorkshire, West Yorkshire) record the occurrence of halophytes in inland situations suggesting the presence of the habitat. However, all natural localities outside Cheshire and Staffordshire appear to have been lost.

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 trend ^{2.3.7} :	Not applicable

The range for this habitat appears to have been stable since 1994. There are likely to have been substantial but unquantified losses of this habitat in the last two centuries causing a concurrent contraction in range (Lee 1975). The potential for expansion of this habitat would depend on the existence of suitable habitat conditions which for H1340 are rather specialised and now absent or very rare.

2.3 Favourable reference range

Favourable reference range^{2.5.1}: **600 km²**

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, 600 km², has been set as the favourable reference area. Reasons for this are discussed below.

The range has been stable since 1994 and the fact that the habitat has persisted as such isolated fragments for so long demonstrates that the existing populations are, in a reductive sense, viable. The current range is therefore the same as the favourable reference range and is set at 600 km².

2.4 Conclusions on range

Conclusion^{2.6.i}: **Favourable**

There has been no recorded decline since 1994 and the current range is equal to the favourable reference range. Therefore, the range is judged to be favourable. However, the habitat's range has declined over the last two centuries to the concern of experts. The significance of the contraction of range in terms of representation of ecological variation is not known at present.

3. Area^{2.4}

3.1 Current area

Total UK extent ^{2.4.1} :	0.005km²
Date of estimation ^{2.4.2} :	May 2007
Method ^{2.4.3} :	3 = ground based survey
Quality of data ^{2.4.4} :	Good

Source: Natural England's designated site files and Phase II survey maps.

Apart from the single SAC for this type, there is only one other confirmed site which is very small in extent (64 m²). Due to the likely very restricted occurrence of suitable habitat conditions and the difficulty of restoring these it is suggested that any expansion targets should be modest and subject to review following further investigations. This would include a field audit of natural brine springs.

The restricted definition of this annex I type, to near-natural sites imposes an anomalous constraint on any expansion targets because it is not clear how the area could be expanded, given that no new inland salt sites can be expected to occur naturally within the next few centuries. It is recommended that this issue, which affects other habitats, should be addressed, if necessary by amending the habitat definition.

Table 3.1.1. provides information on the area of H1340 in the UK.

Table 3.1.1 Area of H1340 in the UK

	Area (ha)	Method ^{2.4.3}	Quality of data ^{2.4.4.}
England	0.5	3	Good
Scotland	Not present	1	
Wales	Not present	1	
Northern Ireland	Not present	1	
Total UK extent ^{2.4.1.}	0.5	3	Good

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 trend ^{2.4.8.}: **Not applicable**

3.3 Favourable reference area

Favourable reference area: **0.005 km²**

Section 3.2.2.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference area estimates have been determined in the UK. Based on this approach, the current extent, 0.005 km², has been set as the favourable reference area. Reasons for this are discussed below.

The habitat's area has declined over the last two centuries to the concern of experts. The significance of this contraction in terms of representation of ecological variation is not known. However, the area has been stable since 1994 and the fact that fragments of the habitat have persisted for so long demonstrates that the existing populations are, in a reductive sense, viable. The current estimated area has, therefore, been set as the favourable reference area.

3.4 Conclusions on area covered by habitat

Conclusion ^{2.6.ii.}: **Favourable**

The area of the habitat has remained stable since 1994 and is equal to the favourable reference area. The conclusion is, therefore, Favourable.

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

4.1 Main pressures ^{2.4.10}

810 Drainage

890 Other human induced changes in hydraulic conditions

140 Grazing

702 air pollution

- Inappropriate Grazing: This has recently been corrected at the Natura 2000 site.
- Nutrient enrichment from flooding/atmospheric deposition: Investigations are underway through the Review of Consents process to see if this is a major issue contributing to unfavourable condition. This habitat was omitted from JNCC's overall assessment of air pollution impacts for FCS reporting, because it is not equivalent to the more widespread habitats which were considered.
- Drainage and water abstraction: It is unclear if these have a current impact on the 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 H1340 in the UK. The guidance for coastal salt marshes is being adapted to assess the site of H1340. The following attributes will be recommended:

- Extent.
- Sward composition: positive indicator species.
- Sward composition: negative indicator species.
- Sward composition: zonation.
- Sward structure: average height.
- Sward structure: bare ground.
- Possibly also Salinity.

It is not clear which of these attributes were used for the existing assessment, which will have included some subjective opinion (R. Jefferson *pers. com.*).

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H1340. 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
- effectively, 100% of the total UK habitat area was in unfavourable condition (only c 0.01% of the UK area is outside an SAC; its condition is unknown).

Table 4.2.1 CSM condition assessment results for UK SACs supporting H1340. 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		
	No change	01	1
	Unclassified		
	Recovering		
	Total	01	1
	% of all assessments	100%	100%
	% of total UK resource	100%	unknown
Favourable	Maintained		
	Recovered		
	Unclassified		
	Total		0
	% of all assessments	0%	00%
	% of total UK resource	0%	unknown

Notes:

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.

The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data from 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)

Only assessments made for qualifying interest features on SAC have been included in this analysis.

Area figures for CSM assessments have been calculated using the data presented on the standard Natura 2000 data forms submitted to the EU. However, the total extent of this habitat is known to be only about 0.5 ha (see section 3.1).

Site of Special Scientific Interest (SSSI)/Area of Special Scientific Interest (ASSI) condition assessments

There are no known occurrences of this habitat on SSSI other than the SAC reported on above in Table 4.2.1.

4.3 Typical species

Typical species^{2.5.3}: **None**

Typical species assessment^{2.5.4}: **Not applicable**

The characteristic species listed below are all much more commonly found in other, less rare, habitats. Therefore, information about typical species has not contributed to the judgement.

The characteristic plants listed in the EU interpretation manual are: *Aster tripolium*, *Atriplex pedunculata* (extinct UK), *A. prostrata*, *Elytrigia atherica* (coastal), *E. pungens* (not UK), *Juncus gerardii*, *Plantago maritima*, *Puccinellia distans*, *Salicornia* spp (coastal), *Spergularia marina*, *Suaeda maritima* (coastal), *Triglochin maritimum*.

Table 4.3.1 Trends of a selection of characteristic plant species

	Trend	Method(s) used to assess typical species^{2.5.4}:
<i>Aster tripolium</i>	Stable	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Atriplex prostrata</i>	Increase*	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Juncus gerardii</i>	Stable	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Plantago maritima</i>	Stable	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Puccinellia distans</i>	Increase*	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Spergularia marina</i>	Increase	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006
<i>Triglochin maritimum</i>	Stable	Preston <i>et al.</i> 2002; Braithwaite <i>et al.</i> 2006

Notes: * increase mainly attributable to spread on roadsides

At the individual species level, all component species are stable or increasing. However, the data do not distinguish between inland and coastal populations and for certain species, increase is due to expansion along the road verges network as a result of the use of de-icing salt. Therefore, typical species have not been used to form this FCS judgement.

Second Report by the United Kingdom under Article 17 on the implementation of the Directive from
January 2001 to December 2006

Current Condition of H1340 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
	None	None
<p>Key <u>Red</u> = unfavourable, i.e. the square contains at least one SAC where this habitat feature is present and has been judged to be unfavourable <u>Green</u> = 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 <u>Blue</u> = 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</p>	<p>Key* <u>Green</u> - 80 – 100% of assessed features on 10km square are favourable <u>Yellow</u> - 50 – 80% of assessed features on 10km square are favourable <u>Orange</u> - 20 – 50% of assessed features on 10km square are favourable <u>Red</u> - 0 – 20% of assessed features on 10km square are favourable *This is the same key as was used for JNCC CSM Report 2006</p>	

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 is in unfavourable condition.

The CSM site condition assessment for the single SAC/SSSI show that this habitat is classed as in unfavourable condition. Thus, the conservation status of the habitat for structure and function has been classified as Unfavourable-Bad. One factor thought to be causing the unfavourable condition, unsuitable grazing, has been addressed. However, nutrient enrichment has yet to be fully assessed; it is expected that direct enrichment can be addressed as an outcome of a review of consents, but diffuse aerial nitrogen deposition may also threaten the habitat, to an unknown extent. On balance, the trend of the habitat’s condition is assessed as improving. The conclusion for this parameter is, therefore, Unfavourable – Bad but improving.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

Almost 100% of the habitat is protected within an SAC and is subject to conservation grazing.

5.1.2 Main future threats^{2.4.11}

810 Drainage

890 Other human induced changes in hydraulic conditions

702 air pollution

The most obvious major future threats to H1340 are listed below, several of which are referred to in Section 4.1.

- Nutrient enrichment from flooding/atmospheric deposition: Investigations are underway through the Review of Consents process to see if this is a major issue contributing to unfavourable condition at Pasturefield Salt marsh SAC/SSSI, where it is probable that favourable condition could be achieved within a ten year timeframe. This habitat was omitted from JNCC’s overall assessment of air pollution impacts for FCS reporting, because it is not equivalent to the more widespread habitats which were considered.
- Climate change: 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 CO₂ 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 H1340 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 H1340 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
- at least 0% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H1340 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		
	Unfavourable no change	01	1
	Unfavourable unclassified		
	Total	01	1
	% 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:

- 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.

SSSI/ASSI condition assessments

There are no known occurrences of this habitat on SSSI other than the SAC reported on above in Table 5.2.1.

Predicted Future Condition of H1340 based on CSM condition assessments (See Sections 5.2 and 7.2 for further information on these maps)

Map 5.2.1 SAC assessments	Map 5.2.2 Assessments strongly indicative of the condition on SSSI/ASSIs	Map 5.2.3 Assessments weakly indicative of the condition on SSSI/ASSIs
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None

None

Key
Red = future-unfavourable, i.e. the square contains one or more SACs where this habitat feature is present and has been predicted to be future-unfavourable
Green = future-favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been predicted to be future-favourable
Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported
Transparent = SAC feature not present, i.e. the square does not contain any SAC features of this habitat type

Key*
Green - 80 – 100% of assessed features on 10km square are favourable
Yellow - 50 – 80% of assessed features on 10km square are favourable
Orange - 20 – 50% of assessed features on 10km square are favourable
Red - 0 – 20% of assessed features on 10km square are favourable
 *This is the same key as was used for JNCC CSM Report 2006

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

Conclusion^{2.6.iv}: **Unknown**

At present it is unclear whether the current conservation actions for this site will bring the site into favourable condition within the specified timeframe (10-15 years). The conclusion is, therefore, Unknown at present.

6. Overall conclusions and judgements on conservation status

Conclusion^{2.6}: **Unfavourable – Bad but improving**

Range and area are Favourable, structure and function is considered Unfavourable – Bad but improving, and future prospects Unknown. The overall conclusion is, therefore, 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.	1
Area covered by habitat type within range	Favourable	Current extent is stable and not less than the favourable reference area.	1
Specific structures and functions (including typical species)	Unfavourable – Bad but improving	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 improving than declining.	1
Future prospects (as regards range, area covered and specific structures and functions)	Unknown	Insufficient information to make a judgement.	3
Overall assessment of conservation status	Unfavourable – Bad but improving	One or more Unfavourable – Bad.	3

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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Map data sources

Inland salt meadows: Congleton/Middlewich. Nature Conservancy Council.

JNCC International Designations Database. Joint Nature Conservation Committee.

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)	1
Number of SACs with CSM assessments (b)	1
% of SACs assessed (b/a)	100
Extent of feature in the UK – hectares (c)	01
Extent of feature on SACs – hectares (d)	01
Extent of features assessed – hectares (e)	01
% 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

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)	1	100%
Current – Favourable (green)		0
On SAC but not assessed (blue)		0
Not on SAC (transparent)		0
Total Number of 10km squares (any colour)	1	
Future – Unfavourable (red)	1	100%
Future – Favourable (green)		0