

**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 :
H4030: European dry heaths**

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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H4030 European dry heaths

Audit trail compiled and edited by JNCC and the UK statutory nature conservation agencies Lowland Heathland and Upland Lead Co-ordination Networks.

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

1. National-biogeographic level information

1.1 General description and correspondance with National Vegetation Classification (NVC) and other habitat types

Table 1.1.1 provides a summary description of H4030 and its relations with UK classifications.

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex* spp., blaeberry/ blaeberry/bilberry *Vaccinium* spp. or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock and/or, in upland areas, for deer or as grouse moors.

Twelve NVC types in Britain meet the definition of this habitat type:

- H1 *Calluna vulgaris* – *Festuca ovina* heath
- H2 *Calluna vulgaris* – *Ulex minor* heath
- H3 *Ulex minor* – *Agrostis curtisii* heath (not H3a and H3b)
- H4 *Ulex gallii* – *Agrostis curtisii* heath (not H4c)
- H7 *Calluna vulgaris* – *Scilla verna* heath (partial)
- H8 *Calluna vulgaris* – *Ulex gallii* heath
- H9 *Calluna vulgaris* – *Deschampsia flexuosa* heath
- H10 *Calluna vulgaris* – *Erica cinerea* heath
- H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath
- H16 *Calluna vulgaris* – *Arctostaphylos uva-ursi* heath
- H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* heath
- H21 *Calluna vulgaris* – *Vaccinium myrtillus* – *Sphagnum capillifolium* heath

Not all forms of these communities are European dry heaths. For example, dry heath vegetation that has developed on deep peat is regarded as degraded bog created by a combination of drainage and burning management, while alpine forms of the last five types listed above (found at high elevations and in northern latitudes around and above the presumed natural tree-line) are referable to Annex I type 4060 Alpine and Boreal heaths. Most forms of H1 *Calluna* – *Festuca* heath belong within the European dry heaths category, including those rare occurrences of the *Carex arenaria* sub-community (H1d) on inland dune systems such as Breckland; but this sub-community is more usually found on the coast, when is referable to 2150 Atlantic decalcified fixed dunes. Stands of H7 *Calluna* – *Scilla* heath on moorland near the sea conform to European dry heaths, but most examples, together with stands of H8d *Calluna* – *Ulex* heath, *Scilla verna* sub-community on sea cliffs, are referable to 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts. Dry heaths vary in their flora and fauna according to climate, and are also influenced by

altitude, aspect, soil conditions (especially base-status and drainage), maritime influence, and grazing and burning intensity. There is a gradation from southerly to northerly kinds of dry heath, and there are also both western (oceanic) and eastern (more continental) forms.

On slightly damp soils in the mild, oceanic climate of south-west England and south and west Wales, there is the uncommon H4 *Ulex – Agrostis* heath, characterised by the frequency of bristle bent *Agrostis curtisii* and western gorse *Ulex gallii*, alongside *Calluna*, bell heather *Erica cinerea* and cross-leaved heath *E. tetralix*. The rare Dorset heath *E. ciliaris* and Cornish heath *E. vagans* are found locally in this community but most such examples would form part of H4020 or H4040. On similarly moist soils further east, in Dorset and the New Forest, *U. gallii* is replaced by dwarf gorse *U. minor* in H3 *Ulex – Agrostis* heath. H2 *Calluna – Ulex* heath occurs on dry acid soils in the lowlands of south-east and central southern England, and is typically dominated by mixtures of *Calluna*, *U. minor* and *E. cinerea*. The semi-continental H1 *Calluna – Festuca* heaths of Breckland on the western Norfolk-Suffolk border are generally overwhelmingly dominated by *Calluna*, with, sometimes, an abundance of lichens. Lowland heaths in southern Britain often support an important fauna, including birds (such as European nightjar *Caprimulgus europaeus* and Dartford warbler *Sylvia undata*), reptiles (such as sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) and invertebrates.

At low to moderate altitudes in warm oceanic parts of southern Britain, the typical form of the habitat is H8 *Calluna – Ulex* heath, characterised by abundant *Calluna*, *U. gallii* and *E. cinerea*. *U. gallii* becomes scarce in the cooler oceanic climate further north, where *E. cinerea* and *Calluna* are abundant together in H10 *Calluna – Erica* heath, especially on more southerly-facing slopes; *E. cinerea* becomes dominant in the hyper-oceanic fringes of the north-west. On more sheltered, humid slopes there are H21 *Calluna – Vaccinium – Sphagnum* heaths with a high cover of bog-mosses *Sphagnum* spp. and hypnaceous mosses, which are best-developed in Scotland but extend south into north-west England and Wales. In the hyper-oceanic far north-west Highlands and Islands these heaths are rich in Atlantic bryophytes, and especially liverworts such as *Bazzania tricrenata*, *Herbertus aduncus* ssp. *hutchinsiae*, *Mastigophora woodsii* and *Pleurozia purpurea*, which develop as luxuriant mats under the canopy of dwarf-shrubs. The UK is one of the most important parts of the world for Atlantic bryophytes, and this is the most important habitat for many of these oceanic species of restricted world distribution.

At low to moderate elevations in the less oceanic areas of north-east England and the Midlands there are often extensive species-poor heaths (H9 *Calluna – Deschampsia* heaths) with an overwhelming dominance of *Calluna* and frequent wavy hair-grass *Deschampsia flexuosa*. These are often the least diverse of all UK heaths. In upland regions further north, there are sub-montane *Calluna*-dominated heaths with abundant blaeberry/bilberry *Vaccinium myrtillus* and crowberry *Empetrum nigrum* ssp. *nigrum* (H12 *Calluna – Vaccinium*), and, in the eastern Scottish Highlands, bearberry *Arctostaphylos uva-ursi* (H16 *Calluna – Arctostaphylos*). *Calluna – Vaccinium* heaths occur throughout the British uplands, but are best-developed in the north Pennines and north-eastern Scotland. They often hold important populations of moorland birds. Red grouse *Lagopus lagopus scoticus*, hen harrier *Circus cyaneus* (heavily persecuted and almost absent from England), merlin *Falco columbarius*, twite *Carduelis flavirostris* (now very restricted), and short-eared owl *Asio flammeus* occur widely. Whimbrel *Numenius phaeopus* and great skua *Stercorarius skua* are especially associated with the northern maritime moors of Scotland. Increasing snow-lie at high altitude favours blaeberry/bilberry species in particular, and H18 *Vaccinium – Deschampsia* heaths are abundant in the central and eastern Scottish Highlands; the rare blue heath *Phyllodoce caerulea* occurs very locally in these snow-bed heaths which grade to 4060 Alpine and Boreal heaths. *Vaccinium*-dominated heaths also occur in more southerly upland areas where *Calluna* heaths have been subjected to heavy grazing and/or inappropriate burning; however many *Calluna* dominated heaths have been created and maintained by burning.

Species-rich forms of dry heath (so-called chalk heath and limestone heath) occur where acid surface deposits overlie calcareous materials. Such heaths contain unusual combinations of heath and calcareous

grassland species, such as common rock-rose *Helianthemum nummularium*, salad burnet *Sanguisorba minor* ssp. *minor*, and the scarce subspecies of hoary rockrose *Helianthemum oelandicum* ssp. *incanum* are very rare in the UK. Other unusual forms of species-rich heath occur in Scotland on base-rich glacial drift or on moderately base-rich rocks, such as those on Rhum in the Inner Hebrides. These support rare or local species, including northern bedstraw *Galium boreale*, intermediate wintergreen *Pyrola media*, stone bramble *Rubus saxatilis*, alpine bistort *Persicaria vivipara* and thyme broomrape *Orobanche alba*. On coastal cliffs and slopes there are maritime H7 *Calluna – Scilla* heaths with spring squill *Scilla verna*, including an unusual lichen-rich waved form in the far north on Orkney and Shetland which has also been recorded in north-west Wales.

Table 1.1.1 Summary description of habitat H4030 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
NVC	<p>In the UK the to the following NVC types form the core of this vegetation:</p> <p>H1 <i>Calluna vulgaris – Festuca ovina</i> heath; H2 <i>Calluna vulgaris – Ulex minor</i> heath; H3 <i>Ulex minor – Agrostis curtisii</i> heath ; H4 <i>Ulex gallii – Agrostis curtisii</i> heath; H7 <i>Calluna vulgaris – Scilla verna</i> heath H8 <i>Calluna vulgaris – Ulex gallii</i> heath; H9 <i>Calluna vulgaris – Deschampsia flexuosa</i> heath.</p> <p>Non-Alpine stands of:</p> <p>H10 <i>Calluna vulgaris – Erica cinerea</i> heath; H12 <i>Calluna vulgaris – Vaccinium myrtillus</i> heath; H16 <i>Calluna vulgaris – Arctostaphylos uva-ursi</i> heath; H18 <i>Vaccinium myrtillus – Deschampsia flexuosa</i> heath; H21 <i>Calluna vulgaris – Vaccinium myrtillus – Sphagnum capillifolium</i> heath.</p> <p>are also be referable to this Annex I type.</p>	<p>Stands of H1-4, and H7-9 occurring on deep peat are excluded from this Annex I type. H4c is excluded from the Annex I definition in the UK. Coastal forms of H1d are referable to H2150 Atlantic decalcified fixed dunes. Most coastal stands of H7 are referable to H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts.</p>
BAP priority habitat type	Upland heathland; lowland heathland	Both priority habitats include other Annex I heathland habitats.
BAP Broad habitat type	Dwarf shrub heath	Both CS2000 and LCM2000 reports using BAP broad habitat types. However there are inaccuracies of categorisation within LCM2000. Broad habitat includes other Annex I type heathland types.
EU Interpretation Manual	31.21 - Sub-montane <i>Vaccinium-Calluna</i> heaths; 31.22 - Sub-Atlantic <i>Calluna-Genista</i> heaths; 31.23 - Atlantic <i>Erica-Ulex Erica cinerea</i> heaths.	

2. Range^{2.3}

2.1 Current range

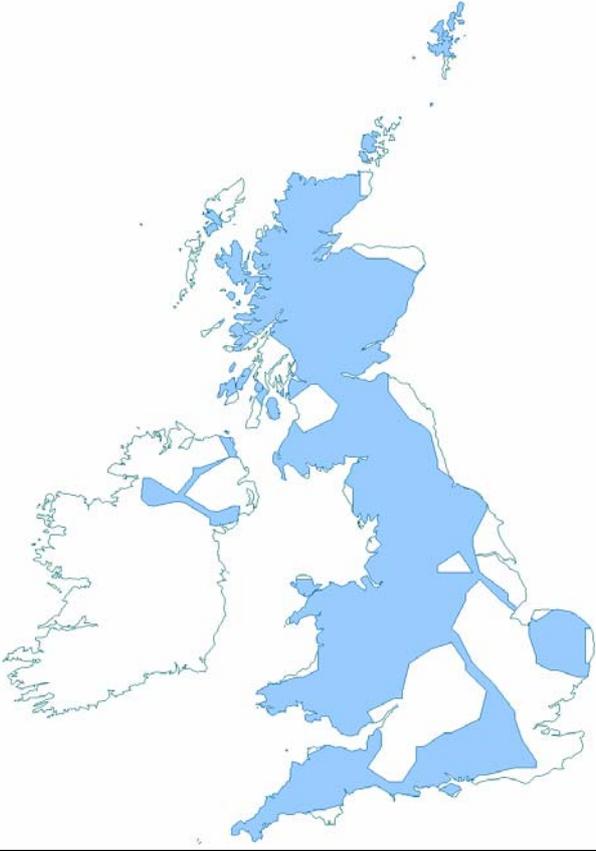
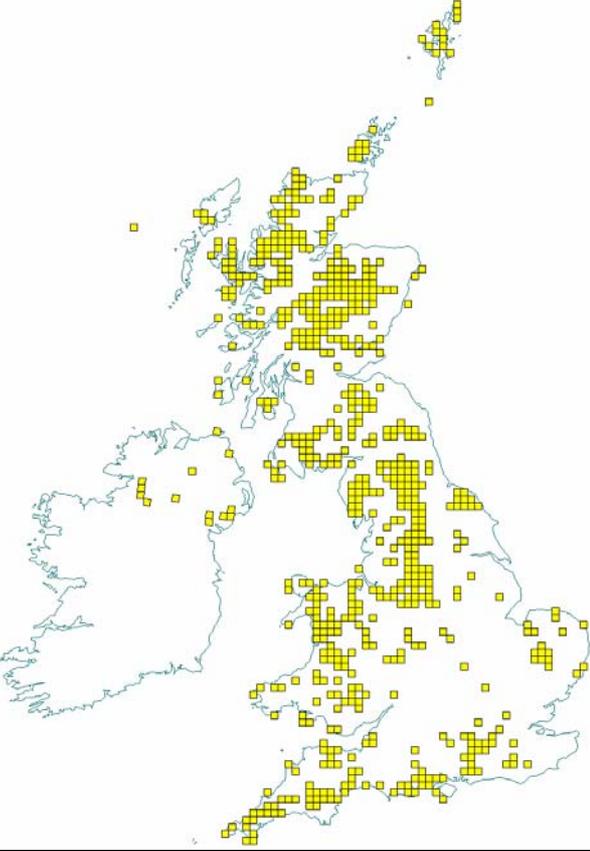
Range surface area^{2.3.1}: **168,266 km²**

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 was clipped to include inland areas only.

Maps 2.1.1 and 2.1.2 show the range and distribution of H4030 in the UK.

Map 2.1.1 Habitat range map ^{1.1} for H4030	Map 2.1.2 Habitat distribution map ^{1.2} for H4030
	
<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: 650</p>

2.2 Trend in range since c.1994

Trend in range^{2.3.4}: **Stable**

Trend magnitude^{2.3.5}: **Not applicable**

Trend period^{2.3.6}: **1994-2006**

Reasons for reported trend^{2.3.7}: **Not applicable**

There is no quantitative information on recent trends in range for H4030. However, expert judgement suggests that there has been no substantial change in range since 1994.

2.3 Favourable reference range^{2.5.1}

Favourable reference range: 168,266 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, 168,266 km², has been set as the favourable reference area. Reasons for this are discussed below.

There are no studies to provide clear evidence of gross change in range and the Annex I type is widespread within the range envelope in Map 2.3.1, and frequent in a significant part of that range. In some areas, however, its occurrences are fragmented (and in the case of lowland locations, usually small). Conservation programmes and agri-environment measures focused on habitat creation measures over the last 10-15 years have helped to begin filling some of the gaps in this range to a limited degree.

In conclusion there are no sources that allow accurate identification of either potential or historic range for H4030 as distinct from other forms of heathland. Expert judgement suggests that the current range has altered little from the historic range. The total current range area, particularly the dominant upland component, is relatively large and reasonably continuous, and is viable. Hence it is suggested that favourable reference range is equal to current range at a UK level.

2.4 Conclusions on range

Conclusion^{2.6.i}: Favourable

The habitat is still widely distributed (but fragmented in the lowlands) within the current range. Although there are known historic losses of area of particular ecotypes within this range (e.g. calcareous heath in southern and eastern England), there is no evidence of any substantial change in range for H4010 since 1994, nor that the 1994 or current ranges are not viable.

Overall the judgement for the UK range for H4030 is Favourable.

3. Area^{2.4}

3.1 Current area

Total UK extent^{2.4.1}: 6,080.22 km²

Date of estimation^{2.4.2}: May 2007

Method^{2.4.3}: 3 = ground based survey

Quality of data^{2.4.4}: Moderate

Table 3.1.1 provides information on the area of H4030 in the UK. This has been based upon those given in 2005 as national Biodiversity Action Plan (BAP) targets for lowland and upland dwarf shrub heath (see <http://www.ukbap-reporting.org.uk/plans/national.asp?S=heathland&L=&O=&SAP=&HAP=&submitted=1&txtLogout=>).

These figures are themselves based on a number of information sources:

- For England the figure for lowland dwarf shrub heath has been based upon records in the Lowland Heathland Inventory (Natural England) and Royal Society for the Protection of Birds (RSPB) Heathland Extent and Potential project carried out in 2005 and for upland heath has been derived from the Natural England Upland habitat Inventory developed in 2005.
- For Scotland the figure for lowland wet heath is taken from Farrell (1993), whilst the upland component is based upon a re-analysis of Countryside Survey 2000 data gathered in 1998-9 (MacGowan and others 2002).
- For Wales the figure for dwarf shrub heath was calculated in 2002-3 and is based upon Phase I survey undertaken during the 1980s and 1990s.
- For Northern Ireland the figure for dwarf shrub heath is an estimate based upon Countryside Survey 2000 data gathered in 1998-9.

Table 3.1.1 Area of H4030 in the UK

	Area (ha)	Method ^{2.4.3}	Quality of data ^{2.4.4}
England	245334	3	Moderate
Scotland	271888	3	Moderate
Wales	80500	3	Moderate
Northern Ireland	10300	3	Moderate
Total UK extent ^{2.4.1}	608,022	3	Moderate

Method used to estimate the habitat surface area: 1 = only or mostly based on expert opinion; 2 = based on remote sensing data; 3 = ground based survey. Only the most relevant class is given if more than one applies.

Quality of habitat surface area data: 'Good' e.g. based on extensive surveys; 'Moderate' e.g. based on partial data with some extrapolation; 'Poor' e.g. based on very incomplete data or on expert judgement.

NOTE: The figures given in Table 3.1.1 are for all dwarf shrub heath, which includes H4010 North Atlantic wet heaths with *Erica tetralix*; H4020 temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*; and H4040 Dry Atlantic coastal heaths with *Erica vagans*. There are no separate figures for the other Annex I types

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}: 1990-1998
Reasons for reported trend ^{2.4.8}: Not applicable

At the UK level, figures from Countryside Survey 2000 suggested a decrease in the dwarf shrub heath Broad Habitat by 59,000 ha (or loss of 3.9% of 1990 stock) between 1990-1998, equivalent to 0.58% per year. However a subsequent study into some of the reported results (Barr *et al.* 2003) suggested that almost all the change recorded came from relatively small changes in overall vegetation character moving monitored vegetation out of the broad habitat in the uplands, and hence could be considered part of the normal fluctuations expected within the upland component of the habitat. The trend figure for the broad habitat of dwarf shrub heath is considered to be representative of the UK trend for H4030, and hence the trend in extent is 'stable'.

3.3 Favourable reference area

Favourable reference area ^{2.5.2}: 6,080 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, 6,080 km², has been set as the favourable reference area. Reasons for this are discussed below.

Past studies (e.g. Farrell 1993; Stevens 1992; Rees 1928; Pembrokeshire Coast National Park 1982) provide clear evidence of large declines in total habitat area particularly for the lowland part of the UK resource of H4030. There is also evidence (e.g. Rose and others 2000) that this lowland part of the resource is fragmented into small areas – a sample survey of lowland heathlands in England (Hewins and others 2007) found that of the 95 samples surveyed only 14 were more than 8 ha in size and the mean stand size was 4.3 ha.

However only around 10% of the UK resource of H4030 is in the lowlands and there is no evidence that the overall area of H4030 in the UK is not viable, but lowland fragmentation does suggest that this part of the resource is at risk. Although the case has been made in the UK BAP for increasing the lowland part of the resource of UK heathland (including H4010) substantially, the balance between the lowland and upland (where no increase in area has been proposed) would still mean that the current total UK area would need to increase by much less than 10% of the current area. Consequently at a UK scale the favourable reference area is likely to equate to the current area.

3.4 Conclusions on area covered by habitat

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

Despite difficulties in mapping the habitat (principally in uplands), available data suggests that the extent of H4030 has decreased historically but evidence for the overall resource suggests that the extent has been stable since 1994.

Whilst fragmentation and patch size are particular issues in the lowlands, the lowland resource of H4030 only accounts for c.10% of the UK extent. For this reason, the favourable reference area is judged to be close to the current extent at a UK scale.

Hence the conclusion for area for H4030 is Favourable.

4. Specific structures and functions (including typical species)

4.1 Main pressures ^{2.4.10}

The following list has been derived from the six year Common Standards Monitoring (CSM) results for Special Areas of Conservation (SACs) designated for their representation of H4030 and results from the 2005 UK BAP reporting (see <http://www.ukbap.org.uk/GenPageText.aspx?id=104> for further details):

- **Over-grazing (140 Grazing; 141 Abandonment of pastoral systems)**

Over-grazing is a particular issue for the upland component of this habitat.

- **Under-grazing (140 Grazing; 141 Abandonment of pastoral systems)**

Lack of grazing is a particular issue for the lowland component of H4030.

- **Invasive species (954 Invasion by a species)**

The impacts of heather beetle (particularly on the upland component of this habitat) appear to be increasing and may become a bigger problem (possibly linked to climate).

- **Development (400 Urbanised areas, human habitation; 401 Continuous urbanisation; 402 Discontinuous urbanisation; 500 Communications networks; 510 Energy transport; 590 Other forms of transportation and communication)**

Development pressures – both direct loss to development and secondary effects such as increased recreation, fragmentation and isolation and associated pressures from development close to the habitat – are a particular issue for the lowland component of this habitat. Renewable energy and other developments such as wind-farms and telecommunications masts are an increasing pressure on the upland part of the resource of H4030.

- **Burning (180 Burning)**

Burning is traditionally used for game and agricultural management of the upland component (moorland) of H4030, but inappropriate burning regimes can lead to loss of interest.

- **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 H4030 in the UK.

The following attributes were examined for all CSM assessments relevant to the lowland component of the habitat:

- Habitat extent.
- Bare ground.
- Vegetation structure: cover of characteristic woody species, and cover of ericaceous species in different growth stages.
- Vegetation composition: frequency of characteristic species (dwarf shrubs, graminoids, forbs), and cover of bryophytes and lichens.
- Indicators of negative trends (percentage of alien or invasive species which may reduce the diversity of the habitat and affect its integrity; presence of artificial drains, soil erosion, trampling; uncontrolled burning; eutrophication).

The following attributes were examined for all CSM assessments relevant to the upland component of the habitat:

- Feature (habitat) extent.
- Vegetation composition: frequency of taxa which are indicators of favourable condition; cover of taxa which are indicators of favourable condition, and others which are indicators of unfavourable condition.
- Vegetation structure: growth stages, burning, grazing, and disturbance.
- Physical structure: ground disturbance.

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H4030. 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:

- 94% of the area and 78% of the number of assessments was unfavourable; and
- at least 30% of the total UK habitat area was in unfavourable condition.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H4030. 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	8,565	17
	No change	101,225	18
	Unclassified	15,971	10
	Recovering	54,676	38
	Total	180,437	83
	<i>% of all assessments</i>	94%	78%
	<i>% of total UK resource</i>	30%	unknown
Favourable	Maintained	11,721	18
	Recovered		
	Unclassified	551	6
	Total	12,272	24
	<i>% of all assessments</i>	6%	22%
	<i>% of total UK resource</i>	2%	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 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)
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.

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:

- 82% of strongly 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 H4030 on SSSI/ASSIs. See notes below table and Technical Note II for further details

Condition	Condition sub-categories	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Unfavourable	Declining	44	
	No change	67	
	Unclassified	4	
	Recovering	161	
	Total	276	
	<i>% of all assessments</i>	82%	<i>%</i>
Favourable	Maintained	18	
	Recovered		
	Unclassified	41	
	Total	59	
	<i>% of all assessments</i>	18%	<i>%</i>

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.

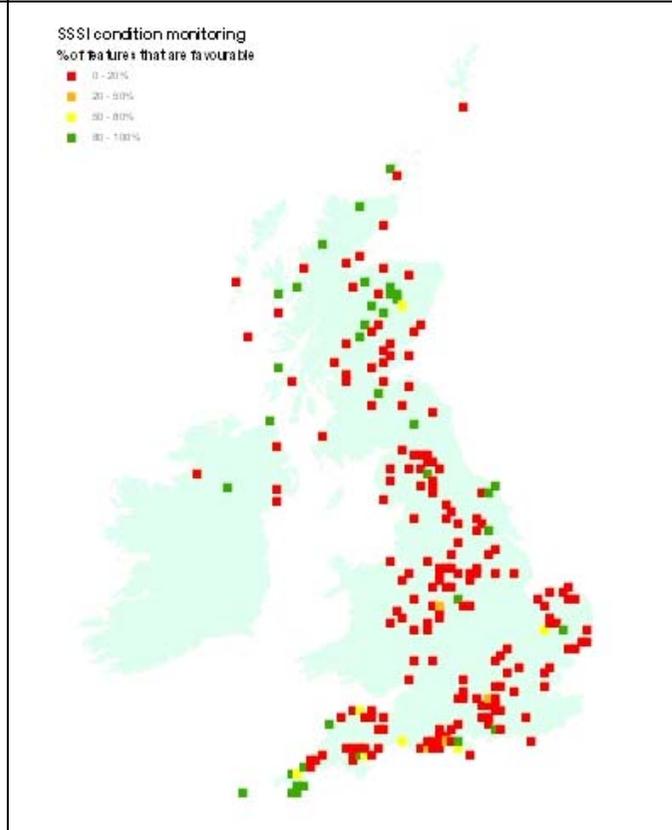
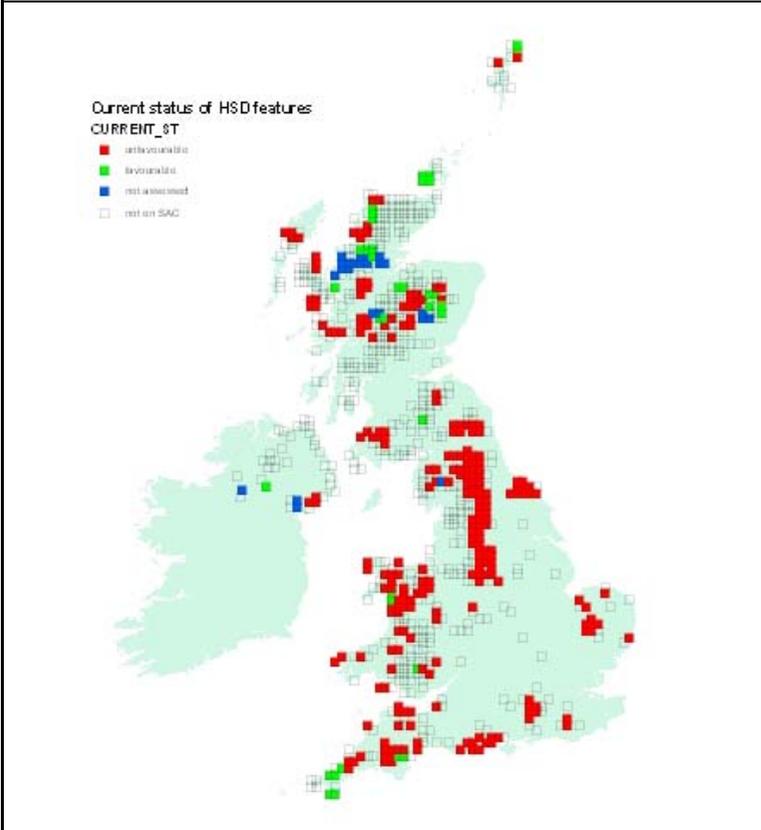
Condition of H4030 beyond the statutory site series

In 2005-6 a sample survey (using the CSM methodology) was carried out of 104 heathland stands in England with roughly equal numbers within and without agri-environment schemes. The survey found that of the 95 dry heath stands surveyed, no stand passed all the attributes and hence none could be considered as in favourable condition (Hewins and others 2007).

Furthermore the results from Countryside Survey 2000 suggested that for the broader dwarf shrub heath broad habitat there was a statistically significant increase in mean fertility, suggesting an overall degradation in habitat quality.

Current Condition of H4030 based on CSM condition assessments (See Sections 4.2 and 7.2 for further information)

Map 4.2.1 SAC assessments **Map 4.2.2** Assessments strongly indicative of the condition on SSSI/ASSIs **Map 4.2.3** Assessments weakly indicative of the condition on SSSI/ASSIs



Not applicable

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

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

4.3 Typical species

Typical species^{2.5.3}: *Cuscuta epithymum*, *Carex montana*, *Lycopodium clavatum*, *Viola lactea*, *Ulex minor*

Typical species assessment^{2.5.4}: **Change in 10 km square occupancy across UK over last 25 years**

The trends of the following typical species are considered to be indicative or informative on the structure and function of the UK resource of H4030.

Table 4.3.1 Trends and faithfulness of selected typical species for H4030

Typical species considered:	Faithfulness to habitat H4030 (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)
<i>Cuscuta epithymum</i>	High	Significant decline, but <25% in 25yrs
<i>Carex montana</i>	Medium	Significant decline, but <25% in 25yrs
<i>Lycopodium clavatum</i>	Medium	No data
<i>Viola lactea</i>	Medium	Significant decline, but <25% in 25yrs
<i>Ulex minor</i>	Medium	Significant decline, but <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 trends for these species suggest a decline in the condition of the wider resource of H4030; however there are no trends for the species since 1994.

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.

Around 32% of the UK resource found in SACs has been assessed and of that 30% of the UK resource is currently judged as unfavourable using CSM. Extrapolating this trend as a sample for the wider resource of H4030 suggests that at least 94% of the resource is unfavourable. For SSSI/ASSIs 82% of all strongly indicative CSM assessments are currently judged as unfavourable. Degradation in functionality for the wider resource is reported under CS 2000, principally through increases in fertility score (Haines-Young *et al.* 2000). Sample data from the survey of non-statutory heathlands in England using the same CSM methodology suggests that most of this resource is in unfavourable condition. Overall this suggests that much more than the 25% area threshold is unfavourable for the structure and function parameter.

The greatest part of the resource of H4030 lies in the uplands and overall this area is at greatest risk from poor grazing, inappropriate burning and air pollution impacting on structure and function. Overall this evidence and expert inference suggests that the conclusion for this parameter is Unfavourable – Bad and deteriorating.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

- Protection within SACs

Almost 19% 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 H4030 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 H4030 outside the statutory site series.

- UK Biodiversity Action Report

The habitat is covered by both the upland and lowland heathland action plans under the UK Biodiversity Action plan (see <http://www.ukbap.org.uk>), as well as under country and local biodiversity action plans and strategies, with targets to maintain, improve, restore and expand the resource. The UK BAP targets proposed in 2006 for upland heathland aim to stop further loss of the heathland resource and bring the present habitat into favourable condition. The UK BAP targets for lowland heathland suggest that there should be a total lowland heathland resource of 106,000 ha by 2030.

In support of the lowland heathland Habitat Action Plan (HAP), the RSPB Heathland Extent and Potential Project (HEAPP) has developed a methodology for identifying the potential for heathland expansion. Although only operating in England so far, the approach uses a heathland 'mask' which identifies where soils and other conditions are suitable for heathland, whilst removing areas where this potential is unlikely to be realised (e.g., high value farmland, development). Preliminary results suggest that there is opportunity for increasing the resource in England by c. 57,000 ha (from c. 58,000 ha), as well as allowing fragmentation to be reduced and patch size increased.

- Tomorrow's Heathland Heritage initiative

This initiative (see <http://www.english-nature.org.uk/thh/>) was established to restore and recreate lowland heathland across the UK. There are local projects in many parts of the UK which are addressing the restoration and appropriate management of a range of heathland types including an unknown proportion of H4030.

5.1.2 Main future threats^{2.4.11}

The most obvious major future threats to H4010 are listed below, several of which are referred to in Section 4.1.

- Over-grazing(**140 Grazing; 141 Abandonment of pastoral systems**)
- Under-grazing(**140 Grazing; 141 Abandonment of pastoral systems**)
- Invasive species (**954 Invasion by a species**)
- Burning (**180 Burning**)

- Air pollution (**402 Air pollution**)

Based on an assessment of the exceedence of relevant critical loads (see Technical Note 3), 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 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 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 H4030 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 5.2.1.1. 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 H4030 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:

- 35% of the area and 58% of the number of assessments fall within the future-favourable category; and
- at least 11% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H4030 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	8,565	17
	Unfavourable no change	101,225	18
	Unfavourable unclassified	15,971	10
	Total	125,761	45
	<i>% of assessments</i>	65%	42%
	<i>% of total UK extent</i>	21%	Unknown
Future-favourable	Favourable maintained	11,721	18
	Favourable recovered		
	Unfavourable recovering	54,676	38
	Favourable unclassified	551	6
	Total	66,948	62
	<i>% of assessments</i>	35%	58%
	<i>% of total UK extent</i>	11%	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.

5.2.2 SSSI/ASSI condition assessments

Table 5.2.2 and Maps 5.2.2 and 5.2.3 summarise the predicted potential future condition of H4030 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:

- 66% of strongly indicative assessments fall within the future-favourable category.

Table 5.2.2 Predicted future condition of H4030 on SSSI/ASSIs based on CSM assessments that were judged to be either strongly or weakly indicative of the condition. See notes below table and Technical Note II for further details

Future condition	Present condition	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Future-unfavourable	Unfavourable declining	44	
	Unfavourable no change	67	
	Unfavourable unclassified	4	
	Total	115	
	<i>% of assessments</i>	34%	<i>%</i>
Future-favourable	Favourable maintained	18	
	Favourable recovered		
	Unfavourable recovering	161	
	Favourable unclassified	41	
	Total	220	
	<i>% of assessments</i>	66%	<i>%</i>

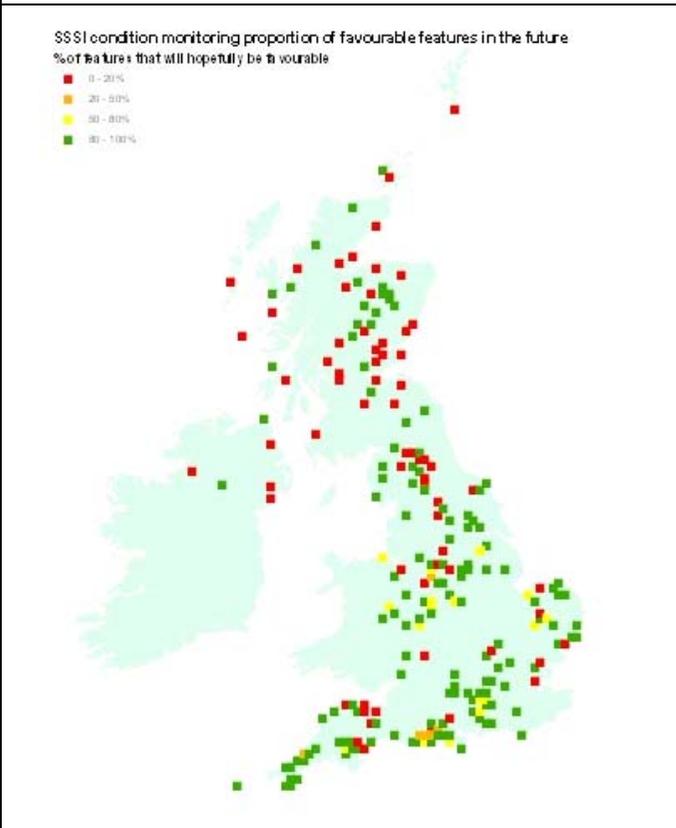
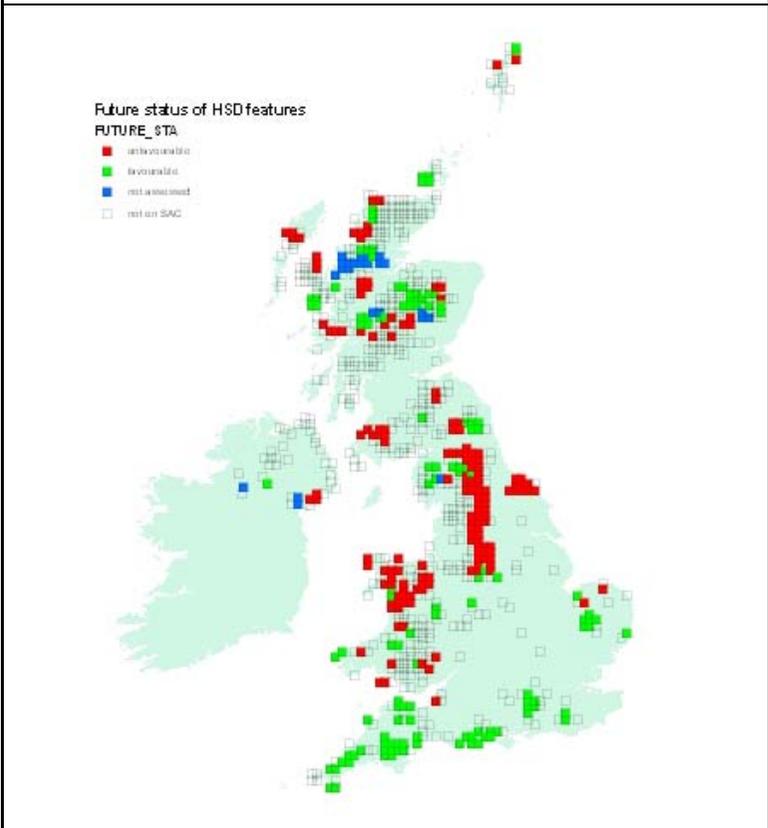
Note that the scenario presented above is based on the same information as used to construct the Table in section 4.1. It is based on the following premises:

- 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.

Predicted Future Condition of H4030 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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Not applicable

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

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

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

Conclusion^{2.6.iv}: Unfavourable – Bad but improving

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 pressure (uplands); lack of management (lowlands); inappropriate burning (uplands); agricultural improvement; fragmentation and disturbance) on the overall resource of H4030 are being addressed for the small proportion of the resource within the statutory site series; and (through agri-environment measures and similar positive management) for an unknown proportion of the resource lying outside H4030. However, even within the SAC series 65% (equivalent to 21% of the overall UK resource of H4030) and 35% of the SSSI/ ASSI series supporting H4030 is likely to remain unfavourable.

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 the area of H4030 in the UK by more than 1% p.a., the evidence from sample surveys such as Countryside Survey 2000 when combined with the future favourability from CSM suggest that more than 25% of the area of the habitat will remain unfavourable through these factors into the foreseeable future. Hence the conclusion for this parameter has to be Unfavourable – Bad but improving.

6. Overall conclusions and judgements on conservation status^{2.6}

Conclusion^{2.6}: Unfavourable – Bad and deteriorating

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

Table 6.1 Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Favourable	Current range is stable and not less than the favourable reference range.	2
Area covered by habitat type within range	Favourable	Current area is stable and not less than the favourable reference area.	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.	2
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Bad but improving	Habitat prospects over the next 12-15 years is 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 Unfavourable – Bad judgements. No overall trend to parameters.	3
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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

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

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

Data	Value
Number of SACs supporting feature (a)	117
Number of SACs with CSM assessments (b)	107
% of SACs assessed (b/a)	91
Extent of feature in the UK – hectares (c)	608,022
Extent of feature on SACs – hectares (d)	199,717
Extent of features assessed – hectares (e)	192,709
% of total UK hectarage on SACs (d/c)	33
% of SAC total hectarage that has been assessed (e/d)	96
% of total UK hectarage that has been assessed (e/c)	32

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)	248	32%
Current – Favourable (green)	35	4%
On SAC but not assessed (blue)	23	3%
Not on SAC (transparent)	481	61%
Total Number of 10km squares (any colour)	787	
Future – Unfavourable (red)	159	20%
Future – Favourable (green)	124	16%