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 :

H4010: Northern Atlantic wet heaths with *Erica tetralix*

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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H4010 Northern Atlantic Wet Heaths with *Erica tetralix*

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 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 H4010 and its relations with UK classifications. Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage. The vegetation is typically dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, grasses, sedges and *Sphagnum* bog-mosses.

In the UK this vegetation corresponds to the following NVC types:

H5 *Erica vagans – Schoenus nigricans* heath
M14 *Schoenus nigricans – Narthecium ossifragum* mire
M15 *Scirpus cespitosus – Erica tetralix* wet heath
M16 *Erica tetralix – Sphagnum compactum* wet heath

M15 *Scirpus – Erica* wet heath is found in areas with a moderate to high rainfall, and is the typical form of wet heath in the north and west of the UK. *E.tetralix* and *Calluna* are typically accompanied by abundant deergrass *Trichophorum cespitosum* and purple moor-grass *Molinia caerulea*. In the far north-west of Scotland, bell heather *Erica cinerea* and woolly fringe-moss *Racomitrium lanuginosum* are also characteristic, along with an abundance of Atlantic bryophytes. In the north, there may be a high cover of *Cladonia* lichens. At high altitude northern and montane species are represented. Where there is movement of mildly base-rich water through the peat, sedges *Carex* spp. and a wide range of species favoured by flushing occur. The latter includes distinctive variants that are often characterised by abundant bog-myrtle *Myrica gale*, or black bog-rush *Schoenus nigricans*.

M16 *Erica – Sphagnum* wet heath is characteristic of drier climates in the south and east, and is usually dominated by mixtures of *E. tetralix*, *Calluna* and *Molinia*. The bog-moss *Sphagnum compactum* is typically abundant, while on Orkney and at high altitude in the eastern Scottish Highlands, *Cladonia* lichens are abundant. In the south, species with a mainly southern distribution in Britain, such as marsh gentian *Gentiana pneumonanthe*, brown beak-sedge *Rhynchospora fusca* and meadow thistle *Cirsium dissectum*, enrich wet heaths. At high altitude in northern Scotland forms of the community rich in northern and montane species occur and often also have an abundance of *Cladonia* lichens.

On The Lizard in Cornwall, Cornish heath *Erica vagans* growing with *S. nigricans*, *E. tetralix* and *Molinia* forms a distinctive and unique form of wet heath (H5 *Erica – Schoenus* heath), found nowhere else in Europe. A further very local wet heath type is M14 *Schoenus – Narthecium* mire, which is mainly associated with transitions from heath to valley bog at a small number of lowland sites in southern Britain. Forms of *Schoenus – Narthecium* mire with *Cladium* are referable to Annex I type 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*.

The full range of variation within wet heath in the UK also includes types rich in lichens, *Racomitrium lanuginosum* or *S. nigricans* found in the Hebrides and Northern Isles of Scotland, which are not adequately described by the NVC.

Wet heaths occur in several types of ecological gradient. In the drier areas of the south and east, wet heaths are local and often restricted to the transition zone between 4030 European dry heaths and constantly wet valley mires. In the uplands they occur most frequently in gradients between dry heath or other dry, acid habitats and 7130 Blanket bogs. At high altitude in the Scottish Highlands wet heaths occur in mosaics with 4060 Alpine and Boreal heaths; in these situations lichens and northern or montane species may be well-represented. Flushed wet heaths are especially frequent in areas of high rainfall, and occur as topogenous fens, usually in channels within heath or grassland vegetation.

Wet heath is an important habitat for a range of vascular plant and bryophyte species of an oceanic or Atlantic distribution in Europe, several of which have an important part of their EU and world distribution in the UK.

Northern Atlantic wet heaths with *Erica tetralix* are restricted to the Atlantic fringe of Europe between Norway and Normandy. A high proportion of the EU resource occurs in the UK but are highly localised in parts of southern and central England. Wet heaths become increasingly extensive in the cool and wet north and west, especially in the Scottish Highlands. However, the area covered by wet heath is significantly smaller than that covered by 7130 Blanket bogs or dry heath.

Table 1.1.1 Summary description of habitat H4010 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
EU Interpretation Manual	PAL.CLASS: 31.11, Humid, peaty or semi-peaty heaths, other than blanket bogs, of the Atlantic and sub-Atlantic domains.	
NVC	• H5 *Erica vagans – Schoenus nigricans* heath • M14 *Schoenus nigricans – Narthecium ossifragum* mire • M15 *Scirpus cespitosus – Erica tetralix* wet heath • M16 *Erica tetralix – Sphagnum compactum* wet heath	
BAP priority habitat type	Lowland heathland; upland heathland.	Priority habitats include other Annex I heathland habitats.
BAP Broad habitat	Dwarf shrub heath.	Both CS2000 and LCM200 reports using BAP broad habitat types. However there are inaccuracies of categorisation within LCM 2000. Broad habitat includes other Annex I type heathland types.

2. Range [2.3]

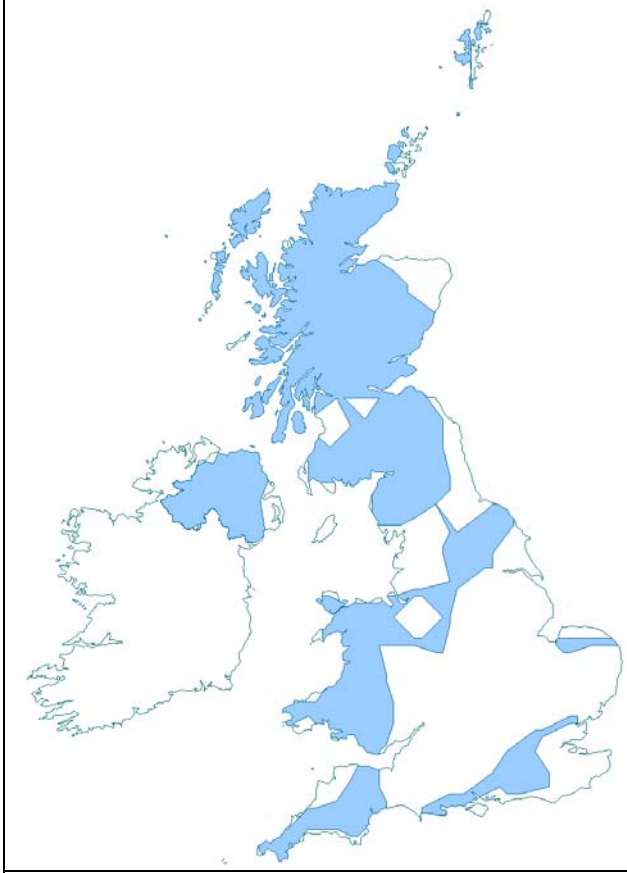
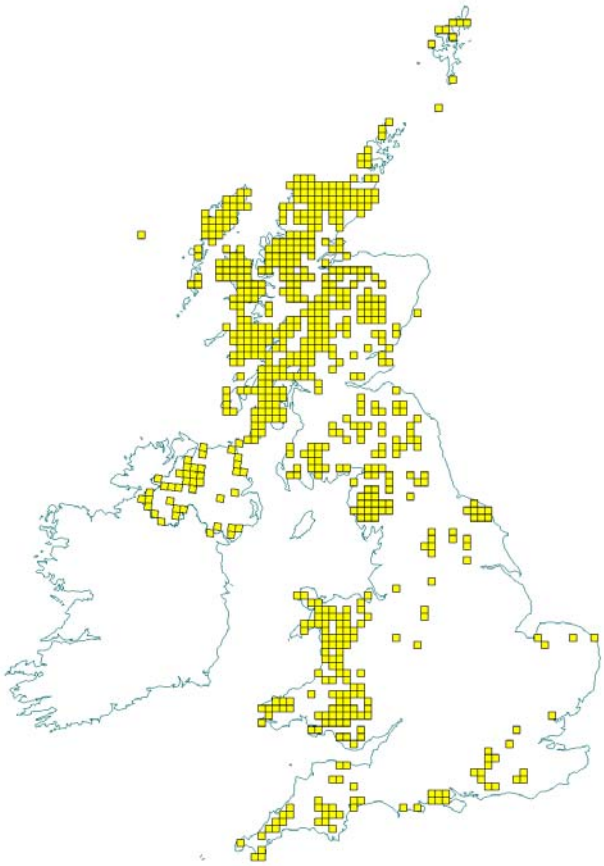
2.1 Current range

Range surface area [2.3.1]: 135,387 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 H4010 in the UK. H4010 is not evenly distributed along with dry heath. The habitat is more extensive in the west of the UK, especially in Wales, and in Scotland in the north-west Highlands and on the western and northern Isles (except for communities corresponding to M16 in the NVC, which have a more easterly distribution.

Map 2.1.1 Habitat range map [1.1] for H4010	**Map 2.1.2** Habitat distribution map [1.2] for H4010
	
Range envelope shown in blue/grey shade in above map is a minimum convex polygon constructed using JNCC Alpha Shapes tool (see Technical Note I for details of methodology).	Each yellow square represents a 10x10-km square of the National Grid and shows the known and/or predicted occurrence of this habitat. 10-km square count: 707

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**

2.3 Favourable reference range

Favourable reference range[2.5.1]: **135,387 km^2**

Section 3.2.1.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference range estimates for habitats have been determined in the UK. Based on this approach, the current surface area, 135,387 km^2, has been set as the favourable reference area. Reasons for this are discussed below.

Sources of UK evidence and expertise on range and changes in range concentrate on either upland vs. lowland heath (and within these distinctions, wet or dry); or on the Broad Habitat of dwarf shrub heath rather than any specific Annex I type.

There are many studies (e.g. Farrell 1993; Rose and others 2000) to suggest substantial contractions in the extent of the heathland resource overall over the past 200 years following afforestation and agricultural intensification in the uplands; and agricultural improvement, afforestation and development in the lowlands (see references and discussions in area, structure and function and future prospects sections). Whilst providing clear evidence for a contraction in area (extent), many of these studies do not in themselves provide clear evidence for a contraction in range.

The major cause of loss of wet heath in the Scottish uplands where much of the resource of H4010 is concentrated is to afforestation, mainly occurring in the SW Highlands and Islands and in Dumfries and Galloway. However, in the heartlands for wet heath (north-west Highlands, Outer Hebrides, Jura, Rum, Skye and Northern Isles) there has been little afforestation. This suggests that proportional losses of wet heath due to afforestation are likely to be less than dry heath because of extensive afforestation further south and east in Scotland, with minimal impacts on habitat range.

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 in some areas frequent, while in others it occurs as scattered, fragmented (and in the case of lowland locations, usually small) areas. 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 some degree.

In conclusion there are no sources that allow accurate identification of either potential or historic range for H4010. Expert judgement suggests that the current range has altered little from the historic range. The total current range area, particularly the 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. In the Scottish uplands where most of the resource is concentrated there is unlikely to have been any contractions in range at the 10 km square level caused by afforestation or overgrazing. There is unlikely to have been a significant loss of any variants in the types of wet heath in the uplands or lowlands which lie outside the current range envelope.

Overall there is no evidence of any substantial change in range since 1994, nor that the 1994 or current ranges are not viable. Hence the the judgement for the UK range for H4010 is 'favourable.'

3. Area [2.4]

3.1 Current area

Total UK extent [2.4.1]: 4,620 km^2
Date of estimation [2.4.2]: May 2007
Method [2.4.3]: 1 = only or mostly based on expert opinion
Quality of data [2.4.4]: Poor

Table 3.1.1 provides information on the area of H4010 in the UK. 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.

The estimates in Table 3.1.1 are based on a number of information sources.

- For England the figure for lowland wet heath has been based upon the Lowland heathland inventory (Natural England /RSPB) and for upland wet heath an estimate has been provided.
- For Scotland the estimate is calculated from a number of information sources, including the Land Cover Survey for Scotland (LCS88), and site-based information.
- For Wales the figure is based upon survey undertaken during the 1980s and 1990s.
- The figure for Northern Ireland is an estimate based upon Countryside Survey data, but this is likely to be an over-estimate as it may include some areas of **7130 Blanket bogs**. The figures include degraded or poor quality examples of this habitat type.

Table 3.1.1 Area of H4010 in the UK

	Area (ha)	Method [2.4.3]	Quality of data [2.4.4]
England	25,000	1	Poor
Scotland	340,000-400,000	1	Poor
Wales	12,000	1	Poor
Northern Ireland	<55,000	1	Poor
Total UK extent [2.4.1]	432,000-492,000 (median value 462,000ha)	1	Poor

Method used to estimate the habitat surface area: 1 = only or mostly based on expert opinion; 2 = based on remote sensing data; 3 = ground based survey. Only the most relevant class is given if more than one applies.
Quality of habitat surface area data: 'Good' e.g. based on extensive surveys; 'Moderate' e.g. based on partial data with some extrapolation; 'Poor' e.g. based on very incomplete data or on expert judgement

3.2 Trend in area since c.1994

Trend in area[2.4.5]: Stable
Trend magnitude[2.4.6]: Not applicable
Trend period[2.4.7]: 1990-2000
Reasons for reported trend[2.4.8]: Not applicable

There are no reliable specific sources for identifying changes to H4010 as distinct from H4030, which is equally widespread.

At the UK level, figures from Countryside Survey 2000 suggest 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.

This figure masks a gain of c. 9% of the 1990 area from acid grassland, bog and bracken Broad Habitat coupled with a loss of c. 13% of the 1990 area to bracken, bog and acid grassland (i.e. 87% of the stock was carried over from 1990-1998) (Haines-Young *et al.* 2000). At a UK level the most significant amount of change was in Scotland (decline of 58,000 ha or 5.4% of the 1990 stock area in Scotland), where the change equates to around 4% of the UK area.

A subsequent study into some of the reported results (Howard 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 and hence could be considered part of the normal fluctuations expected within the upland component of the habitat. Consequently it is judged that there was no overall trend for the broad

dwarf shrub heath habitat at a UK level, and no overall tend for the H4010 component of that broad habitat.

3.3 Favourable reference area

Favourable reference area[2.5.2]: c.4320 - 4920 km^2

Section 3.2.1.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference range estimates for habitats have been determined in the UK.

There are difficulties in making distinctions between H4030 and H4010 from past and existing surveillance and monitoring data (principally in the uplands) to infer the historic area of H4010. There has been known substantive change in the areas of dwarf shrub heath (including both H4010 and H4030) in both lowlands and uplands historically. For example on the Llŷn Peninsula in Wales, comparisons can be made between a vegetation study carried out in 1920/2 (Rees 1928) and the Phase I survey carried out in 1987/88. This work shows that the net area of dry heath decreased by 95% during this period, equivalent to 1.4% p.a. (Blackstock *et al.* 2005). Although this only represents a small area of Wales it is likely that a similar pattern of loss has occurred throughout Welsh wet heaths in the lowlands.

Evidence for the Scottish uplands, a core location for this habitat type, suggests that whilst losses have occurred, habitat corresponding to H4010 is still extensive and expert judgement suggests that it is likely to be at or close to favourable reference area there.

Fragmentation, small patch size and isolation are particular (but not exclusive) issues for the lowland part of the UK resource of H4010, which only represents around 10% by area of the total UK resource.

Overall there is no firm evidence that the favourable reference area lies outside the range of values given for the current area of the total resource of H4010 as given in Table 3.1.1.

3.4 Conclusions on area covered by habitat

Conclusion[2.6.ii]: Favourable

Expert judgement suggests that the total UK area of H4010 is likely, within the range of values given, to equate to favourable reference area. Although the extent of the lowland part of H4010 may be up to 10% below its favourable reference area, the lowland part of the resource represents no more than 10% of the total UK area of H4010; hence any necessary increase in the extent of this lowland part of the resource to address fragmentation, patch size and isolation issues would lie within the range of values given for the total current extent of H4010.

The rate of change of area in recent times appears to be minimal for the resource overall, although this is difficult to separate out from the rates for H4030 and H4010 from monitoring data. Hence, the conclusion on area for H4010 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 H4010 and results from the 2005 UK BAP reporting (see www.ukbap.org.uk/GenPageText.aspx?id=104 for further details):

- Over-grazing **(140 Grazing)**
  Over-grazing is a particular issue for the upland component of this habitat. However wet heath tends to be less attractive to grazing animals than dry heath and this may have led to relatively smaller losses due to overgrazing.

- Under-grazing/lack of management **(140 Grazing; 141 Abandonment of pastoral systems)**
  Lack of grazing is a particular issue for the lowland component of H4010.

- 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 or atmospheric deposition).

- 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 fragmentation and isolation, increased recreation and associated pressures from development close to the habitat – are a particular issue for the lowland component of this habitat. Renewable energy and communication mast developments are a pressure on this habitat in the uplands.

- Burning **(180 Burning)**
  Burning is a traditional management tool for management of the upland component (moorland) of H4010, but can lead to damage to particular elements of the core habitat. Inappropriate burning management combined with inappropriate grazing can lead to loss of dwarf-shrubs from wet heath. There is evidence in the Scottish Highlands that intense burning may have converted blanket bog plant communities to wet heath.

- Water management **(810 Drainage)**
  Lack of water due to drainage is a particular issue for H4010.

- 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 www.jncc.gov.uk/page-2199) provide a means to assess the structure and functioning of H4010 in the UK. 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: browsing and burning.
- Physical structure: ground disturbance due to human and herbivore.

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H4010. 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:

- 79% of the area and 84% of the number of assessments was unfavourable; and
- at least 11% of the total UK habitat area was in unfavourable condition.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H4010. 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	8,076	9
	No change	23,689	18
	Unclassified	1,852	5
	Recovering	18,210	20
	Total	51,826	52
	% of all assessments	***79%***	***84%***
	% of total UK resource	***11%***	***unknown***
Favourable	Maintained	12,709	8
	Recovered		
	Unclassified	1,169	2
	Total	13,878	10
	% of all assessments	***21%***	***16%***
	% of total UK resource	***3%***	***unknown***

Notes

1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC. (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).
3. Only assessments made for qualifying interest features on SAC have been included in this analysis.
4. Area figures for CSM assessments have been calculated using the data presented on the standard Natura 2000 data forms submitted to the EU.

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

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:

- 85% 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 H4010 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	21	
	No change	21	
	Unclassified	4	
	Recovering	64	
	Total	110	
	% of all assessments	***85%***	***%***
Favourable	Maintained	3	
	Recovered	1	
	Unclassified	16	
	Total	20	
	% of all assessments	***15%***	***%***

Notes

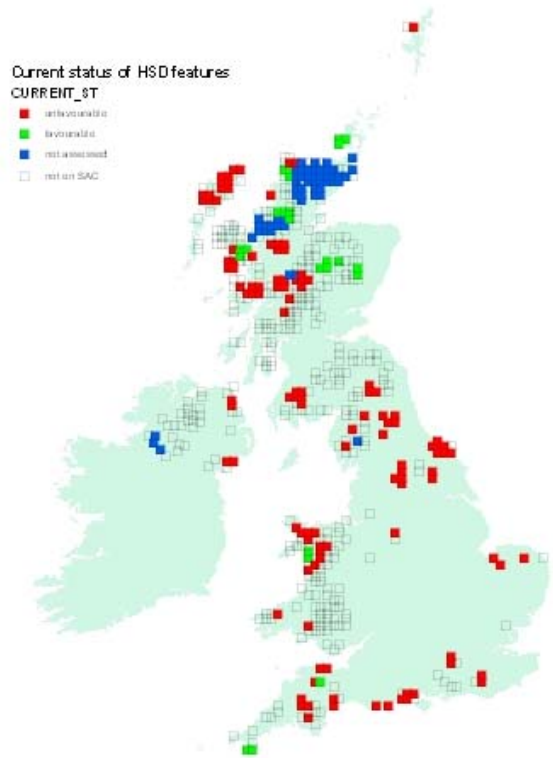
5. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
6. The data included are from CSM assessments carried out between April 1998 and March 2005, as used for the JNCC Common Standards Monitoring Report 2006.

Condition of H4010 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 eight wet 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 for a representative sample of the broader dwarf shrub heath showed a statistically significant increase in mean fertility, suggesting an overall degradation in habitat quality. This is believed to be equally representative for the H4010 component of this broad habitat.

Current Condition of H4010 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 10-km square are favourable Yellow - 50 – 80% of assessed features on 10-km square are favourable Orange - 20 – 50% of assessed features on 10-km square are favourable Red - 0 – 20% of assessed features on 10-km square are favourable *This is the same key as was used for JNCC CSM Report 2006	

4.3 Typical species[2.5.3 and 2.5.4]

Typical species[2.5.3]: ***Platanthera bifolia***

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 indicative or informative on the structure and function of the UK resource of H4010.

Table 4.3.1 Trends and faithfulness of selected typical species for H4010

Typical species considered [2.5.3]:	**Faithfulness to habitat H4010 (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)**
Platanthera bifolia	**Very High**	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 this species suggests a decline in the condition of the wider resource of H4010; however there are no trends for the resource 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 in unfavourable condition.

CSM data for SACs and particularly SSSIs suggest high proportions of sites are unfavourable, and this represents much more than the 25% area threshold for the overall UK resource of H4010.

Although a high proportion of these protected sites are recovering, the amount in the protected site series represents only a small amount of the overall UK resource. By contrast, sample surveys of the wider lowland resource of H4010 in England and by CS2000 for the broad habitat of dwarf shrub heath, which includes H4010, suggests substantial degradation in functionality, principally through increases in fertility score, in the period 1990-2000. Hence, the judgement of Unfavourable – Bad and deteriorating for this parameter for the overall resource of H4010.

5. Future prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

- Protection within SACs

Almost 22% 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 H4010 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 H4010 outside the statutory site series.

- UK BAP

The habitat is covered by both the upland and lowland heathland action plans under the UK Biodiversity Action plan (see www.ukbap.org.uk), as well as under country and local biodiversity action plans and strategies, with targets to maintain, improve, restore and (for the small lowland part of the resource) to expand the resource of H4010.

- Tomorrow's Heathland Heritage initiative

This initiative (see 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 that are addressing the restoration and appropriate management of a range of heathland types including an unknown proportion of H4010.

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)**

Over-grazing (a particular pressure in parts of the uplands) should decline as agri-environment measures and management agreements begin to take effect.

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

Under-grazing is likely to remain a particular issue for the lowland component of H4010, but may decline as agri-environment measures and management agreements begin to take effect.

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

- 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)**

- Burning **(180 Burning)**

Inappropriate burning (a particular pressure in parts of the uplands) should decline as agri-environment measures and management agreements begin to take effect.

- Water management **(810 Drainage)**

Lack of water due to drainage is a particular issue for H4010. Whilst agri-environment measures and management agreements may have some positive effect, climate change could increase the adverse impact on the habitat.

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

Based on an assessment of the exceedance 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_2 concentrations); the responses of habitats and species to these changes (for instance location, phenology, community structure) and the role of other socio-economic drivers of environmental change. The scale of change in habitats and species as a result of climate change will vary across ecosystems. Small changes in the climate are more likely to have a substantial impact on habitats and species which exist within a narrow range of environmental conditions. The future impacts of climate change on UK biodiversity will be exacerbated when coupled with other drivers of environmental change.

5.2 Future condition **(as regards range, area covered and specific structures and functions)**

5.2.1 CSM condition assessments

The CSM condition assessments reported in Sections 4.2.1-2 provide a basis to predict the potential future condition of H4010 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 H4010 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:

- 49% of the area and 48% of the number of assessments fall within the future-favourable category; and
- at least 7% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H4010 based on current Common Standards Monitoring 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	8,076	9
	Unfavourable no change	23,689	18
	Unfavourable unclassified	1,852	5
	Total	33,617	32
	% of assessments	***51%***	***52%***
	% of total UK extent	***7%***	***Unknown***
Future-favourable	Favourable maintained	12,709	8
	Favourable recovered		
	Unfavourable recovering	18,210	20
	Favourable unclassified	1,169	2
	Total	32,088	30
	% of assessments	***49%***	***48%***
	% of total extent	***7%***	***Unknown***

Note that the scenario presented above is based on the same information as used to construct the Table in section 4.1. It is based on the following premises:
(i) the unfavourable-recovering condition assessments will at some point in the future become favourable;
(ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
(iii) sympathetic management will be sustained on sites already classified as favourable and these will not be seriously damaged by any unforeseen events.
IMPORTANT NOTE: We do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'favourable' condition being attained.

SSSI/ASSI condition assessments

Table 5.2.2 and Maps 5.2.2 and 5.2.3 summarise the predicted potential future condition of H4010 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:

- 65% of strongly indicative assessments fall within the future-favourable category.

Table 5.2.2 Predicted future condition of H4010 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	21	
	Unfavourable no change	21	
	Unfavourable unclassified	4	
	Total	46	
	% of assessments	***35%***	***%***
Future-favourable	Favourable maintained	3	
	Favourable recovered	1	
	Unfavourable recovering	64	
	Favourable unclassified	16	
	Total	84	
	% of assessments	***65%***	***%***

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:

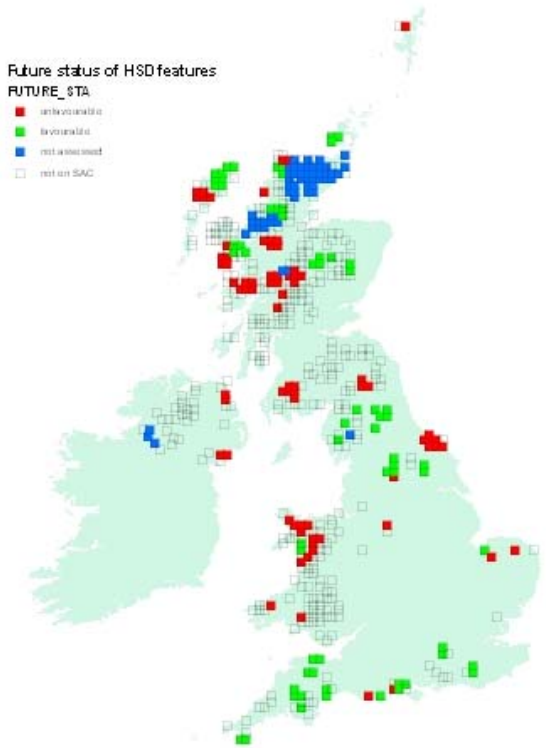
(i) the unfavourable-recovering condition assessments will at some point in the future become favourable;

(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.

Predicted Future Condition of H4010 based on CSM condition assessments (See Sections 5.2 and 7.2 for further information)

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

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 H4010 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 H4010. However other threats (particularly pollution and – to a lesser extent given the focus on the next 10-15 years – climate change) are less readily addressed.

Within the SAC series 51% of the assessed area of H4010 (equivalent to 7% of the overall UK resource of H4010) and 35% of the strongly indicative features of H4010 on the SSSI/ASSI series with this habitat are likely to remain unfavourable. In the absence of other data, extrapolating this figure beyond statutory sites suggests that at least 51% of the UK resource of H4010 is likely to remain unfavourable into the foreseeable future. Even when all of the positive measures are taken into account, there is little likelihood that this will reduce the amount of the resource in unfavourable condition to less than 25%.

There is no evidence to suggest a future decline in either the range or area of H4010 in the UK by more than 1% per annum in the next 10-15 years.

Overall these considerations lead to a judgement of Unfavourable – Bad but improving.

6. Overall conclusions and judgements on conservation status [2.6]

Conclusion[2.6.iv]: 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	Current range is stable and not less than the favourable reference range.	2
Area covered by habitat type within range	Favourable	Current extent 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	Unfavourable – Bad but improving	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	3

structures and functions)		overall UK resource.	
Overall assessment of conservation status	Unfavourable – Bad and deteriorating	Two Unfavourable-Bad judgements; future prospects are 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

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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)	71
Number of SACs with CSM assessments (b)	62
% of SACs assessed (b/a)	87
Extent of feature in the UK – hectares (c)	462,000
Extent of feature on SACs – hectares (d)	99,367
Extent of features assessed – hectares (e)	65,705
% of total UK hectarage on SACs (d/c)	22
% of SAC total hectarage that has been assessed (e/d)	66
% of total UK hectarage that has been assessed (e/c)	14

Notes

1. Extent of features on SACs (d) includes only those features that have been submitted on the official Natura 2000 data form as qualifying features. This figure is based on the habitat extent figures presented on standard Natura 2000 data forms.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).

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

Status	Number of squares	Proportion of all squares
Current – Unfavourable (red)	116	22%
Current – Favourable (green)	24	5%
On SAC but not assessed (blue)	55	10%
Not on SAC (transparent)	335	63%
Total Number of 10-km squares (any colour)	530	
Future – Unfavourable (red)	75	14%
Future – Favourable (green)	65	12%