

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 :

**H6230: Species-rich *Nardus* grassland, on
siliceous substrates in mountain areas (and
submountain areas in continental Europe)**

Please note that this is a section of the report. For the complete report visit <http://www.jncc.gov.uk/article17>

Please cite as: Joint Nature Conservation Committee. 2007. *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

H6230 Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)

Audit trail compiled and edited by JNCC and the UK statutory nature conservation agencies Upland Lead Co-ordination Network

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 H6230 and its relations with UK classifications.

Species-rich *Nardus* grasslands tend to develop where there is flushing through base-rich strata on siliceous bedrock. These may include moderately base-rich metamorphic and igneous rocks. The soils have an acidic pH (<7.0 and mainly <6.0) and are derived from bedrocks with at least some silica. Species-rich *Nardus* grasslands on limestone are excluded from the definition of this Annex I habitat because limestone lacks silica. The altitudinal range varies from near sea level to an upper limit of between 800 and 900 m. H6230 grasslands are important because they support a wide range of species, including Atlantic, sub-Atlantic and arctic-alpine plants and invertebrates.

Species present in the grassland tend to be mesophilic. Swards are closely grazed and consist of a complex mosaic of grasses, small herbs and bryophytes. As defined by the NVC, two main types of species-rich *Nardus* grasslands occur in the UK:

CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus praecox* grassland

CG11 *Festuca ovina* – *Agrostis capillaris* – *Alchemilla alpina* grassland

As noted above, only forms of these two communities on siliceous substrates are included within this Annex I category. More species-rich sub-types of NVC communities U4 *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland and U5 *Nardus stricta* – *Galium saxatile* grassland are also included within the habitat definition. This especially applies to the *Carex panicea* – *Viola riviniana* sub-community of U5. Variation within these communities is related chiefly to altitude, oceanicity, soil moisture and the extent of flushing with base-rich water. At high altitude there is a greater representation of arctic-alpine plants, and the habitat can be transitional floristically to and grade into H6170 Alpine and subalpine calcareous grasslands. Floristically richer areas develop where there is a concentration of base-rich or calcareous strata, giving suitable conditions for the rarer base- or calcium-loving species. In such situations, especially where outcrops of limestone occur, transitions to H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) may develop.

Low-altitude variants of H6230 are extensive in the Western Isles and the extreme western Highlands but also occur locally in the eastern Highlands. In the west, where oceanic influences predominate, communities are characterised by the presence of Atlantic or sub-Atlantic species, including both vascular

plants and bryophytes. Some examples contain maritime species, and may show transitions to sub-maritime grasslands.

Floristically the two main NVC types included in H6230 are closely related. They are characterised by a mix of grasses, typically sheep's-fescue *Festuca ovina*, common bent *Agrostis capillaris*, sweet vernal-grass *Anthoxanthum odoratum*, mat-grass *Nardus stricta*, red fescue *Festuca rubra*, heath grass *Danthonia decumbens* and wavy-hair grass *Deschampsia flexuosa*. There is a wide range of small dicotyledonous herbs, including heath bedstraw *Galium saxatile*, tormentil *Potentilla erecta*, common dog-violet *Viola riviniana*, wild thyme *Thymus polytrichus*, ribwort plantain *Plantago lanceolata* and harebell *Campanula rotundifolia*. The main difference between the two communities is the frequency and abundance of alpine lady's-mantle *Alchemilla alpina* and the frequency of bilberry *Vaccinium myrtillus* in *Festuca – Agrostis – Alchemilla* grassland, and the high frequency of selfheal *Prunella vulgaris* in *Festuca – Agrostis – Thymus* grassland. The latter community tends to occur more extensively at lower altitudes, where it supports more lowland species than the former. However, both types extend to the same maximum altitude, and both types are enriched with arctic-alpines at the higher end of their altitudinal range. Both communities also show variation related to soil moisture. Herbs such as white clover *Trifolium repens*, field wood-rush *Luzula campestris*, heath speedwell *Veronica officinalis*, yarrow *Achillea millefolium*, mountain everlasting *Antennaria dioica*, bitter-vetch *Lathyrus linifolius*, field gentian *Gentianella campestris*, pill sedge *Carex pilulifera* and spring sedge *Carex caryophyllea* are characteristic of drier swards. Species such as flea sedge *C. pulicaris*, carnation sedge *C. panicea*, pale sedge *C. pallescens*, grass of parnassus *Parnassia palustris*, purging flax *Linum catharticum* and quaking grass *Briza media* occur in areas with high soil moisture.

At high altitudes, where the swards are more flushed, the arctic-alpines yellow saxifrage *Saxifraga aizoides*, purple saxifrage *S. oppositifolia*, alpine meadow-rue *Thalictrum alpinum* and alpine bistort *Persicaria vivipara* may be frequent. Other arctic-alpines or northern species that are represented include the lady's-mantles *Alchemilla filicaulis* ssp. *filicaulis* and *A. wichurae*, hair sedge *Carex capillaris*, rock sedge *C. rupestris*, Scottish asphodel *Tofieldia pusilla*, alpine mouse-ear *Cerastium alpinum*, alpine clubmoss *Diphasiastrum alpinum*, northern bedstraw *Galium boreale*, spiked wood-rush *Luzula spicata*, cyphel *Minuartia sedoides*, globeflower *Trollius europaeus*, alpine cinquefoil *Potentilla crantzii*, sibbaldia *Sibbaldia procumbens* and mountain pansy *Viola lutea*. At low altitudes in the west there may be representation of maritime species, such as sea plantain *Plantago maritima*, buck's-horn plantain *P. coronopus* and wild carrot *Daucus carota*. Also in the west, Atlantic or oceanic bryophytes such as *Herbertus stramineus*, *Plagiochila spinulosa*, *Scapania gracilis* and *Mastigophora woodsii* may occur, and more generally there are calcicole species, such as *Barbilophozia lycopodioides*, *Aulacomnium turgidum* and *Schistidium apocarpum*. Other notable bryophytes, such as *Lophozia obtusa*, have also been recorded in this habitat.

Table 1.1.1 Summary description of habitat H6230 and its relations with UK vegetation/habitat classifications

Classification	Correspondence with Annex I type	Comments
EU Interpretation Manual	PAL.CLASS.: 35.1- <i>Violo-Nardion</i> (<i>Nardo-Galion saxatilis</i> , <i>Violion caninae</i>); 36.31- <i>Nardion</i> .	Based on CORINE classifications.

NVC	CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland CG11 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Alchemilla alpina</i> grassland.	Only stands of CG10 and CG11 on siliceous substrates are considered to be referable to this Annex I type; stands on limestone are excluded. Stands of CG10 on limestone with a significant representation of <i>Mesobromion</i> species may be referable to Annex I type H6210. Species-rich forms of U4 and U5 may be referable to Annex I type 6230. (Jackson and McLeod 2000)
BAP priority habitat type	Upland calcareous grassland.	H6230 is partly covered by this priority habitat type
JNCC CSM reporting categories, for SAC feature and ASSI/SSSI feature types	Calcareous grasslands - uplands (See Williams 2006 www.jncc.gov.uk/page-3520)	A broader category which covers the following Annex I feature types: H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (<i>Festuco-Brometalia</i>). H6230 Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe).
JNCC CSM Guidance feature types	Calcareous grasslands (uplands) (See JNCC 2005b www.jncc.gov.uk/page-2237)	A broader category which covers the following Annex I feature types: H6170 Alpine and subalpine calcareous grasslands. H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>). H6230 Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe).

2. Range ^{2.3}

2.1 Current range

Range surface area ^{2.3.1}: **53,831 km²**

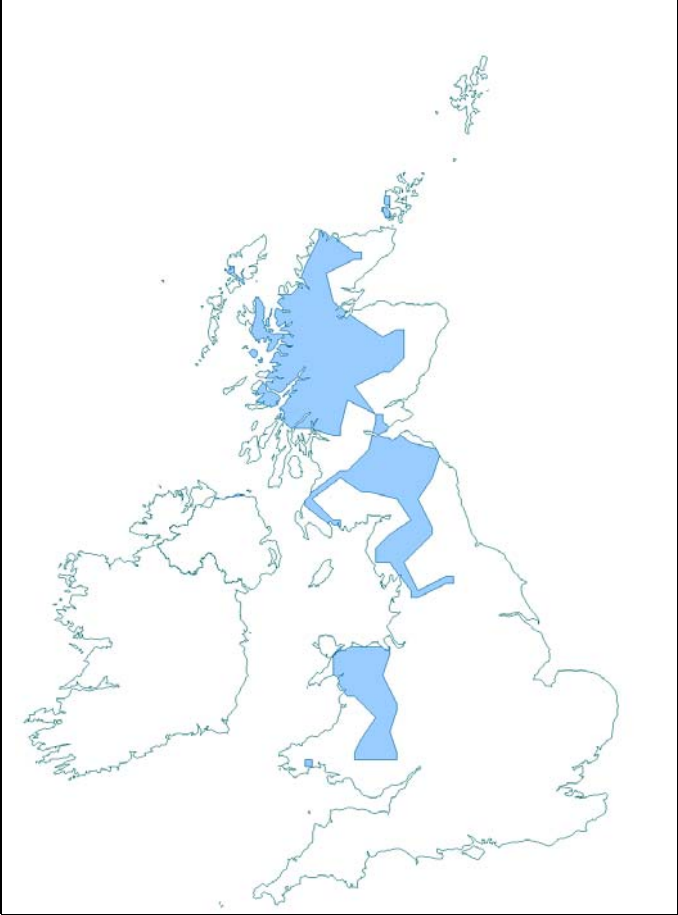
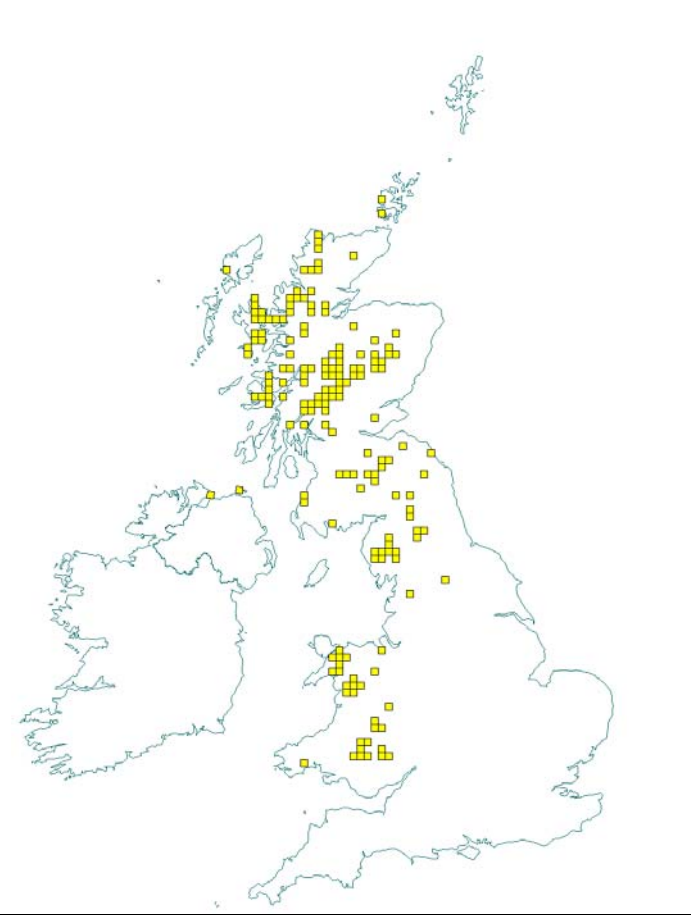
Date calculated ^{2.3.2}: **May 2007**

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 H6230 in the UK, based upon mapping of the occurrence of the core NVC communities CG11 and a subset of CG10 filtered to remove those sites known to be on limestone.

Species-rich *Nardus* grasslands are rare in mainland Europe, being restricted to the cooler areas of mountain regions, but are widely-developed in the UK, especially in western Scotland. (Jackson and McLeod 2000).

Map 2.1.1 Habitat range map ^{1.1} for H6230	Map 2.1.2 Habitat distribution map ^{1.2} for H6230
	
<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: 170</p>

See Section 7.1 for data sources

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 readily available quantitative evidence or information on any trend in range for H6230 since 1994. Expert opinion is that high grazing levels in the UK uplands since the 1800s have led to an expansion in the range of H6230 historically, particularly in the core areas in the Scottish uplands. However, the range of the habitat is likely to have remained relatively stable since 1994.

2.3 Favourable reference range

Favourable reference range^{2.5.1}: 53,831 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, 53,831 km², has been set as the favourable reference area. Reasons for this are discussed below.

There is no readily available information on the historic range of H6230 before 1994.

The current range of H6230 as shown on Map 2.1.2 is naturally limited by the physical requirements for base-rich flushing on siliceous rocks and from survey data, there appears to be little scope for increase in

range. These requirements also mean that the resource has a naturally fragmented distribution within its range, particularly outside Scotland.

Given the widespread occupation of the UK uplands by sheep or deer the distribution of H6230 shown in Map 2.1.2 is likely to be occupying most of its potential natural range. Furthermore the favourable reference range and distribution is likely to match closely the current range and distribution.

2.4 Conclusions on range

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

Within the physical restrictions on its occurrence, H6230 is a relatively widespread habitat found across the uplands. There is no empirical information on any changes in range for H6230 since 1994, nor any previous historical data on extent or changes. Expert opinion suggests that there has been past expansion of the range of H6230 due to increases in grazing levels since the 1800s. However current range is considered viable and to be close to both potential range for the habitat and to its favourable reference range; consequently the judgement on range for H6230 is Favourable.

3. Area^{2.4}

3.1 Current area

Total UK extent^{2.4.1}: **41.94km²**
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 H6230 in the UK.

Table 3.1.1 Area of H6230 in the UK

	Area (ha)	Method ^{2.4.3}	Quality of data ^{2.4.4}
England	40	1	Poor
Scotland	4000	1	Poor
Wales	18	1	Poor
Northern Ireland	30	1	Moderate
Total UK extent^{2.4.1}	4,194	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.

There is no accurate information on the extent of H6230 beyond the Special Area of Conservation (SAC) series; for Scotland the estimate of 4,000 ha mostly lies on SACs and Sites of Special Scientific Interest (SSSIs) and for Northern Ireland the figure is derived from survey work for the Northern Ireland Countryside Survey 2000.

The figures given in Table 3.1.1 for England and Wales, and the total UK extent, are totals of the area of H6230 recorded on relevant SACs. Consequently the figure given for the total UK extent of H6230 is likely to be a minimum figure. However as most of the resource is known from Scotland, the opinion of upland experts from the country conservation agencies as represented on the Uplands Lead Co-ordination Network is that the true UK extent is unlikely to be much larger and so the total figure has been used as the basis for calculations elsewhere in this assessment

3.2 Trend in area since c.1994

Trend in area^{2.4.5}:	Stable
Trend magnitude^{2.4.6}:	Not applicable
Trend period^{2.4.7}:	1994-2006
Reasons for reported trend^{2.4.8}:	Not applicable

There is no readily available quantitative evidence or information on any trend in area for H6230 since 1994. As for range, expert opinion is that high grazing levels in the UK uplands since the 1800s have led to an expansion in the extent of H6230 historically, particularly in the core areas in the Scottish uplands. However, the extent of the habitat is likely to have remained relatively stable since 1994.

3.3 Favourable reference area

Favourable reference area^{2.5.2}: **41.94 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, 41.94 km², has been set as the favourable reference area. Reasons for this are discussed below.

The potential area of H6230 is naturally limited by the need for base-rich flushing on siliceous rocks.

There is no readily available information on the historic area of H6230 before 1994. However expert opinion suggests that the area occupied by H6230 has probably expanded since the introduction of high levels of grazing to the UK uplands in the 1800s and more specifically since the 1950s. The habitat is developed widely where there are suitable base-rich rocks (mainly schist and igneous rocks including basalt) supporting moist soils at moderately high altitudes. These richer rocks tend to attract grazing sheep and deer and develop grassland, even where the prevailing vegetation is dwarf-shrub heath. Where the suitable rocks are extensive the habitat can be extensive. Expert judgement is that given the natural environmental restrictions on H6230 as well as the high levels of grazing which favour this habitat (often at the expense of dwarf-shrub heath) the potential range of this habitat is likely to be fully occupied. Further increases in grazing are likely to have adverse impacts on the condition of existing stands of H6230.

Hence the expert judgement is that at a UK level 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**

The extent of the habitat is naturally limited by the requirement for base-rich flushing on siliceous rocks. Information on the extent and any trend in extent of H6230 currently or historically is limited. However expert judgement is that high grazing levels in the uplands since the 1800s are likely to have led to an expansion in H6230, such that the current area is thought to be close to its maximum potential area. It is believed that there has been little change in the total UK area since 1994.

Overall the current extent of H6230 is viable and likely to be close to its favourable reference area. Consequently the judgement for area of H6230 is Favourable.

4. Specific structures and functions (including typical species)

4.1 Main pressures^{2.4.10}

The following list of main pressures for H6230 has been derived from the six year CSM results for SACs designated for their representation of H6230 and results from the 2005 UK Biodiversity Action Plan (BAP) reporting (see <http://www.ukbap.org.uk/GenPageText.aspx?id=104> for further details). The related EC codes are shown in brackets:

Audit trail

- **Grazing (140 Grazing)**

Overgrazing results in a loss of structure and low rates of flowering when the vegetation is cropped close to the ground surface. This favours low growing species but other species may occur in dwarf-form or be eliminated altogether. There may also be a loss of diversity of the invertebrate fauna. Heavy grazing can cause bare ground to develop, which may lead to soil erosion.

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

The invasive species, New Zealand Willow herb *Epilobium brunnescens* occurs on sites supporting H6230 in the moist soil conditions of western Scotland, especially where grazing has favoured open ground.

- **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 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 H6230 in the UK. The following attributes were examined for all CSM assessments relevant to 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

SACs include about 4,194 ha (see Technical note II) of H6230 in the UK in a well dispersed network across its range

Table 4.2.1 and Map 4.2.1 summarise the CSM condition assessments for UK SACs supporting habitat H6230. 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:

- 97% of the area and 84% of the number of assessments was unfavourable; and
- at least 70% of the total UK habitat area was in unfavourable condition.

Table 4.2.1 CSM condition assessment results for UK SACs supporting H6230. 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	1,046	1
	No change	1,832	12
	Unclassified	25	2
	Recovering	40	1
	Total	2,944	16
	<i>% of all assessments</i>	97%	84%
	<i>% of total UK resource</i>	70%	unknown
Favourable	Maintained	77	3
	Recovered		
	Unclassified		
	Total	77	3
	<i>% of all assessments</i>	3%	16%
	<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 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.

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 H6230 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	11	
	No change	25	
	Unclassified	1	
	Recovering	38	
	Total	75	
	<i>% of all assessments</i>	90%	%
Favourable	Maintained	3	
	Recovered		
	Unclassified	5	
	Total	8	
	<i>% of all assessments</i>	10%	%

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.

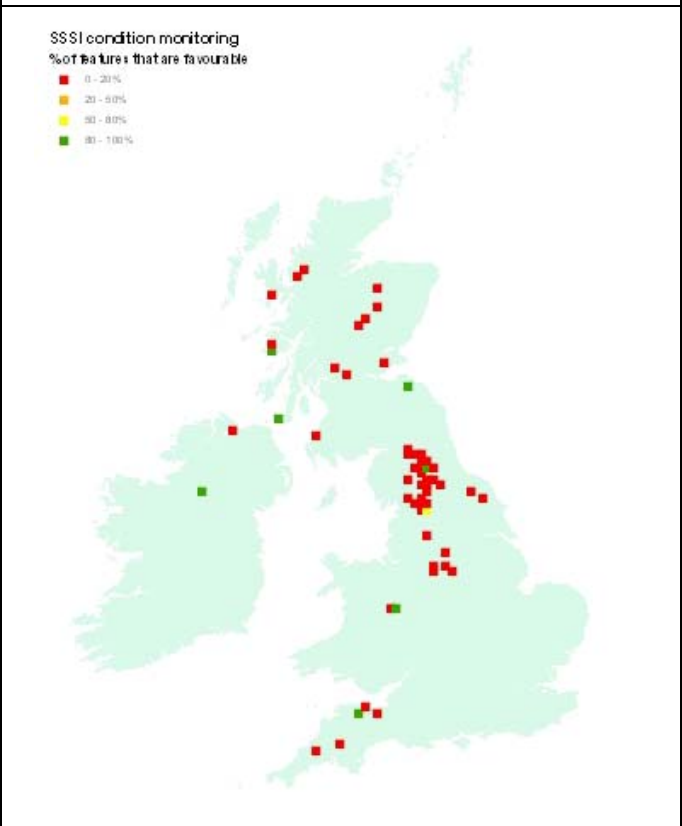
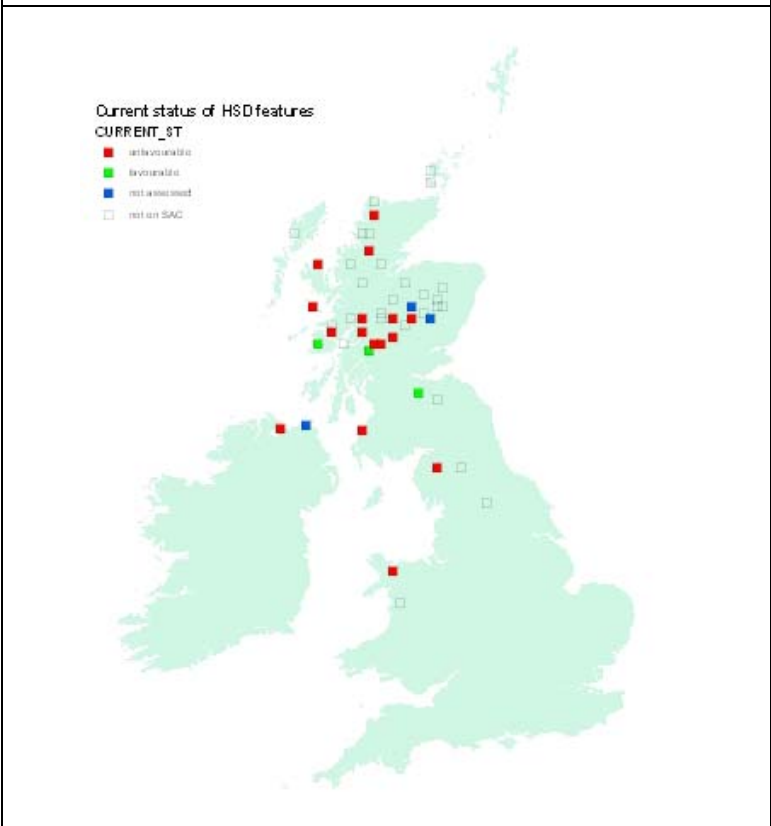
SSSI/ASSI condition assessments

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:

- 90% of strongly indicative assessments were unfavourable.

Current Condition of H6230 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
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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}: None
Typical species assessment^{2.5.4}: Not applicable

There are no species listed in the EU Interpretation Manual nor identified from analyses of the core NVC communities that have a particular faithfulness to H6230 in the UK; nor whose UK-level trends are considered to be indicative or informative on the structure and function of H6230.

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

Conclusion^{2.6.iii}: Unfavourable – Bad

The EC Guidance states that where “more than 25% of the area of the habitat is unfavourable as regards its specific structures and functions”, the conclusion should be Unfavourable – Bad. In the UK this was generally taken to mean that more than 25% of the habitat area is in unfavourable condition.

CSM data for 2000-2006 for SACs suggest 84% of the number of assessed SACs supporting H6230, and 97% of the assessed SAC area (equivalent to 70% of the UK total area for H6230) were unfavourable. Around 35% of the assessed SAC area is recovering and only 1% is declining, suggesting a general improvement in the condition of H6230 in these sites.

The majority of the resource of H6230 lies within SACs: extrapolating these trends to the wider resource of H6230 suggest that much more than 25% of the overall resource is likely to be in unfavourable condition. However expert opinion suggests that the CSM results for SACs may require some further analysis to ensure a consistent approach to these assessments between sites. Overall the available information suggests a judgement of Unfavourable - Bad for the structure and function parameter for H6230, but given the uncertainties over the accuracy of assessments a low level of confidence is associated with this judgement.

5. Future prospects

5.1.1 Conservation measures

- Protection within SACs

The majority of the known resource of H6230 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 smaller proportion of the resource of H6230 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 much of the resource of H6230, particularly within the statutory site series.

- UK BAP

H6230 is partly covered by the upland calcareous grassland action plan under the UK BAP (see <http://www.ukbap.org.uk>), as well as under country and local biodiversity action plans and strategies, with targets to maintain, improve, restore and expand the resource.

5.1.2 Main future threats^{2.4.11}

The most obvious major future threats to H6230 are listed below, several of which are referred to in Section 4.1. The measures identified in Section 5.1.1 are addressing some of these factors, with a greater proportion being addressed within the statutory site series. The related EC codes are shown in brackets:

- Grazing (**140 Grazing**)
- Invasive species (**954 Invasion by a species**)
- 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 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 H6230 in the UK. This involved treating all assessments currently identified as either favourable or unfavourable recovering as future-favourable: remaining categories were treated as future-unfavourable – see Table 5.2.1. There are a number of caveats to this approach, which are set out beneath this table.

SAC condition assessments

Table 5.2.1 and Map 5.2.1 summarise the predicted potential future condition of H6230 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:

- 4% of the area and 21% of the number of assessments fall within the future-favourable category; and
- at least 3% of the total UK habitat area falls within the future-favourable category.

Table 5.2.1 Predicted future condition of UK SACs supporting H6230 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	1,046	1
	Unfavourable no change	1,832	12
	Unfavourable unclassified	25	2
	Total	2,903	15
	<i>% of assessments</i>	96%	79%
	<i>% of total UK extent</i>	69%	Unknown
Future-favourable	Favourable maintained	77	3
	Favourable recovered		
	Unfavourable recovering	40	1
	Favourable unclassified		
	Total	118	4
	<i>% of assessments</i>	04%	21%
	<i>% of total extent</i>	3%	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 H6230 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:

- 55% of strongly indicative assessments fall within the future-favourable category.

Table 5.2.2 Predicted future condition of H6230 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

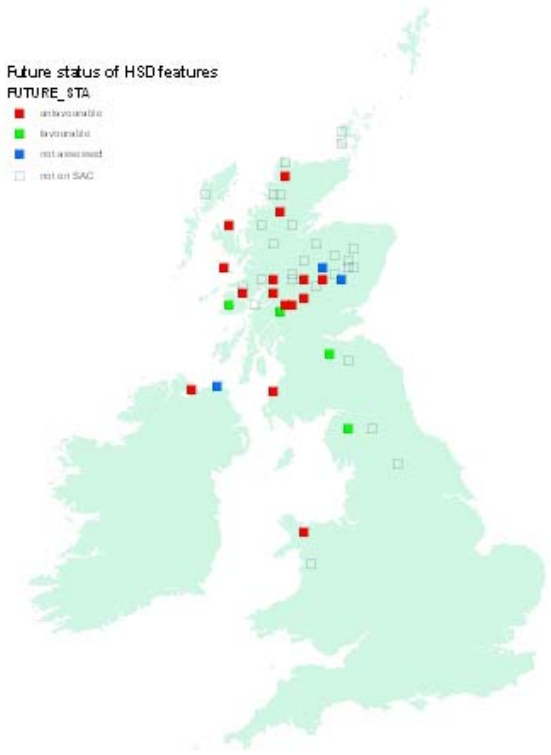
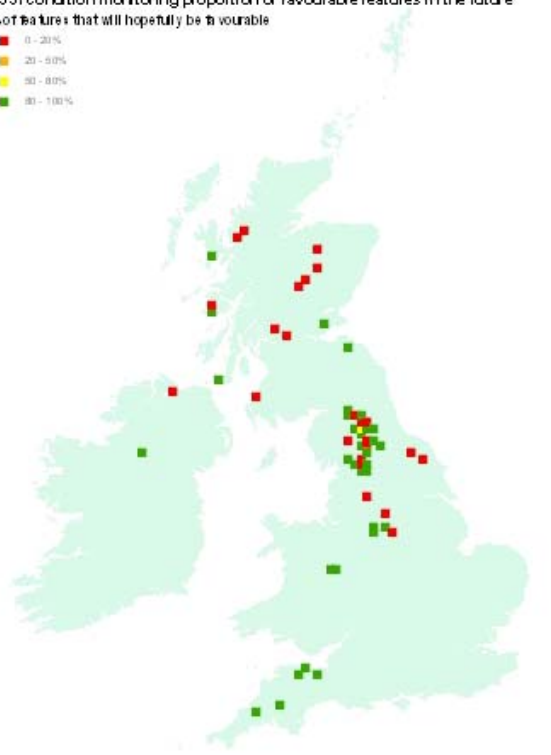
Future condition	Present condition	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Future-unfavourable	Unfavourable declining	11	
	Unfavourable no change	25	
	Unfavourable unclassified	1	
	Total	37	
	<i>% of assessments</i>	45%	<i>%</i>
Future-favourable	Favourable maintained	3	
	Favourable recovered		
	Unfavourable recovering	38	
	Favourable unclassified	5	
	Total	46	
	<i>% of assessments</i>	55%	<i>%</i>

Note that the scenario presented above is based on the same information as used to construct the Table 4.2.2. It is based on the following premises:

- (i) the unfavourable-recovering condition assessments will at some point in the future become favourable.
- (ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
- (iii) sympathetic management will be sustained on sites already classified as favourable and these will not be seriously damaged by any unforeseen events.

IMPORTANT NOTE: we do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'favourable' condition being attained.

Predicted Future Condition of H6230 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
		<p>Not applicable</p>

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

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

The principal future pressure (grazing) on H6230 is being addressed directly for the majority of the resource of H6230 that lies within the statutory site series; and (particularly through agri-environment measures) for the smaller proportion of the resource of H6230 lying outside the statutory site series. However uncertainty over the effective extent of changes to grazing may reduce the confidence associated with this judgement.

Within the SAC series, 96% of the area of SAC and 79% of the sites for the feature are assessed by CSM as “future – unfavourable”. Given the high representation of H6230 on SACs, these figures can be extrapolated to suggest that at least 96% of the total UK resource of H6230 is unlikely to achieve favourable condition in the foreseeable future. The CSM results for SSSI/ASSIs suggest only 45% of the strongly indicative CSM assessments for SSSI/ASSIs are likely to be unfavourable in the foreseeable future.

As there is no evidence to suggest a future decline in the area or range of H6230 in the UK by more than 1% p.a., the evidence from conservation measures (particularly grazing management agreements) currently in place and predicted to operate over the next 15-20 years leads to a judgement of Unfavourable - Bad for the future prospects for H6230.

6. Overall conclusions and judgements on conservation status

Conclusion^{2.6}: Unfavourable – Bad

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

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.	2
Specific structures and functions (including typical species)	Unfavourable – Bad	More than 25% of the habitat area is considered to be unfavourable as regards its specific structures and functions.	3
Future prospects (as regards range, area covered and specific structures and functions)	Unfavourable – Bad	Habitat prospects over next 12-15 years considered to be bad, with severe impact from threats expected and long term viability not assured.	3
Overall assessment of conservation status	Unfavourable – Bad	Two parameters assessed as Unfavourable - Bad but improving.	3

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

7. Annexed material (including information sources used 2.2)

7.1 References

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

JACKSON, D.L. 2000. Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): Definitions and the relationship with other habitat classifications. *JNCC Report No. 307* JNCC, Peterborough.

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

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

JOINT NATURE CONSERVATION COMMITTEE. 2005b. *Common Standards Monitoring Guidance for Upland Habitats* Version May 2005, Peterborough. www.jncc.gov.uk/page-2237

Map Data Sources

Alistair Crowle (personal communication) 2007. Natural England.

Barbara Jones (personal communication) 2007. Countryside Council for Wales.

Dave Horsfield (personal communication) 2007. Scottish Natural Heritage.

JNCC International Designations Database. Joint Nature Conservation Committee.

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

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

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

Data	Value
Number of SACs supporting feature (a)	22
Number of SACs with CSM assessments (b)	19
% of SACs assessed (b/a)	86
Extent of feature in the UK – hectares (c)	
Extent of feature on SACs – hectares (d)	4,194
Extent of features assessed – hectares (e)	3,021
% of total UK hectarage on SACs (d/c)	
% of SAC total hectarage that has been assessed (e/d)	72
% of total UK hectarage that has been assessed (e/c)	

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 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)

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)	16	33%
Current – Favourable (green)	3	6%
On SAC but not assessed (blue)	3	6%
Not on SAC (transparent)	27	55%
Total Number of 10km squares (any colour)	49	
Future – Unfavourable (red)	15	31%
Future – Favourable (green)	4	8%