

**European Community Directive  
on the Conservation of Natural Habitats  
and of Wild Fauna and Flora  
(92/43/EEC)**

Supporting documentation for the  
Third Report by the United Kingdom under  
Article 17

on the implementation of the Directive  
from January 2007 to December 2012  
Conservation status assessment for

Species:

S1393 - Slender green feather-moss (*Hamatocaulis (Drepanocladus)  
vernicosus*)

**IMPORTANT NOTE – PLEASE READ**

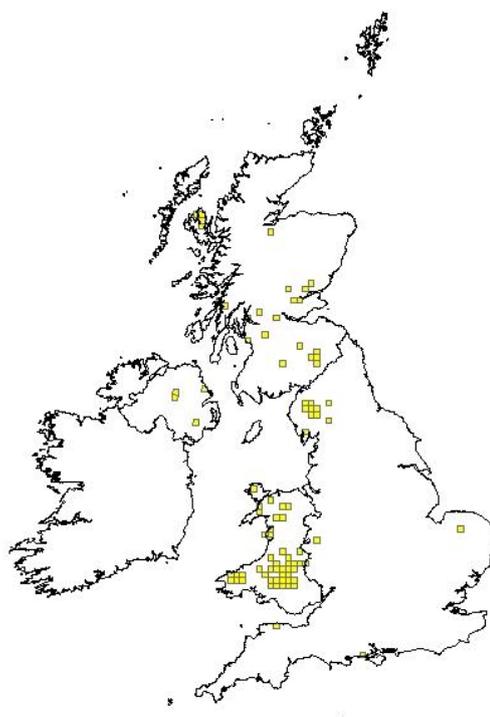
- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural Resources Wales** and refers only to the state of the habitat/species in **Wales** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

As of 1 April 2013, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales became Natural Resources Wales/Cyfoeth Naturiol Cymru

**Reporting format on the 'main results of the surveillance under Article 11'  
for Annex II, IV & V species**

<i>Field name</i>	<i>Brief explanations</i>	
<b>0.2 Species</b>	<b>0.2.1 Species code</b>	<b>S1393</b>
	<b>0.2.2 Species scientific name</b>	<b><i>Hamatocaulis (Drepanocladus) vernicosus</i></b>
	<b>0.2.3 Alternative species scientific name</b> Optional	<b>Hamatocaulis vernicosus</b>
	<b>0.2.4 Common name</b> Optional	<b>Slender Green Feather-moss</b>

<b>1.1 Maps</b>		
<b>1.1.1 Distribution map</b>		<b>Sensitive</b> <b>False</b>
	<p>This is a GOOD representation of the species' distribution in Wales, although there are records from a further 11 10x10km squares in north Wales that have records of <i>Drepanocladus vernicosus</i> and some of them are likely to still support the species because they have not been resurveyed.</p> <p>The map is based on data from the British Bryological Society on NBN , including the Threatened Bryophytes Database. It covers the years 1989-2012. Records from other datasets on NBN are thought likely to include errors and have therefore been excluded from the map.</p>	



<b>1.1.2 Method used - map</b>	<b>Complete survey/Complete survey or a statistically robust estimate</b>
--------------------------------	---

	The map covers the years 1989-2012. Most sites with records from 1989 to 2006 have not been revisited during the reporting period, but the majority are known to be in similar condition to when they were surveyed and are considered to be unlikely to have lost <i>D. vernicosus</i> .
<b>1.1.3 Year or period</b>	<b>2001-2012</b>
<b>1.1.4 Additional distribution map</b>	<b>False</b>
<b>1.1.5 Range map</b>	

<b>2.1 Biogeographical region &amp; marine regions</b>	<b>ATL</b>
<b>2.2 Published sources</b>	<p>"BIRCH, K. 2006. UK0030121 Corsydd Eifionydd Special Area of Conservation SAC Monitoring Report S1393 Slender Green Feather Moss (<i>Hamatocaulis vernicosus</i>). Countryside Council for Wales Report.</p> <p>BOSANQUET, S.D.S. 2009. UK0030221 Mynydd Epynt Special Area of Conservation SAC Monitoring Report S1393 Slender Green Feather Moss (<i>Hamatocaulis vernicosus</i>). Countryside Council for Wales Report.</p> <p>BOSANQUET, S.D.S. 2012. Supporting information for Countryside Council for Wales submission on <i>Drepanocladus vernicosus</i>.</p> <p>BOSANQUET, S.D.S., HALE, A.D., MOTLEY, G.S. &amp; WOODS, R.G. 2006, Recent work on <i>Hamatocaulis vernicosus</i> in Mid and South Wales. <i>Field Bryology</i>.</p> <p>LEWIS, H. 2012. UK0030104 Cadair Idris Special Area of Conservation SAC Monitoring Report S1393 Slender Green Feather Moss (<i>Hamatocaulis vernicosus</i>)</p> <p>HILL, M.O. 1988, A Bryophyte Flora of North Wales. <i>Journal of Bryology</i> 15: 377-491."</p>

<b>2.3 Range</b>	
<b>2.3.1 Surface area Range</b>	The range map has not yet been supplied by JNCC.
<b>2.3.2 Method used Surface area of Range</b>	<p><b>Estimate based on partial data with some extrapolation and/or modelling</b></p> <p>The range map has been derived from an almost complete survey of known <i>Drepanocladus vernicosus</i> sites in Wales.</p>
<b>2.3.3 Short-term trend Period</b>	<p><b>2001-2012</b></p> <p>It has been agreed that the UK should use 2001-2012 (2 reporting periods) to assess short-term trends.</p>

<b>2.3.4 Short term trend</b> <b>Trend direction</b>	<b>decrease 1% or less/year</b>	
	The population trend (2.4.6) suggests a decline in population, although that is actually the result of a lack of return visits to nearly 80 sites recorded between 2001 and 2006 (see Supporting Information, Bosanquet 2012). The range trend therefore appears to be a decline, but that is not a genuine trend. It is likely that if there is any genuine decline in range is on an even smaller scale than a decline in population, because no outlying colonies are actually thought to have been lost.	
<b>2.3.5 Short-term trend</b> <b>Magnitude</b>	<b>a) Minimum</b>	
	<b>b) Maximum</b>	
<b>2.3.6 Long-term trend</b> <b>Period</b>	<b>1989-2012</b>	
	It has been agreed that the UK should use 1989-2012 (4 reporting periods) to assess long-term trends.	
<b>2.3.7 Long-term trend</b> <b>Trend direction</b>	<b>increase</b>	
	The long-term population trend (2.4.11) suggests a large increase in population, although that is entirely the result of an increase in fieldwork in south-west Wales. It is unlikely that there has been any significant range change in Wales.	
<b>2.3.8 Long-term trend</b> <b>Magnitude</b>  Optional	<b>a) Minimum</b>	
	<b>b) Maximum</b>	
<b>2.3.9 Favourable reference</b> <b>range</b>	<b>a) Value in km<sup>2</sup></b>	
	<b>b) Operator for FRR</b>	
	<b>c) FRR is unknown (indicated by "true")</b>	<b>False</b>
	<b>d) Method used to set FRR</b>	

<b>2.3.10 Reason for change</b> Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to...	<b>a) Genuine change?</b>	<b>False</b>
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	There has been considerably more bryophyte recording in south Wales since 2000, and <i>Drepanocladus vernicosus</i> has been specifically targeted for recording in the area. The data are therefore greatly improved.	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

<b>2.4 Population</b>		
<b>2.4.1 Population size estimation</b> (using individuals or agreed exceptions where possible)	<b>a) Unit</b>	
	<b>b) Minimum</b>	
	<b>c) Maximum</b>	
<b>2.4.2 Population size estimation</b> (using population unit other than individuals) Optional ( <i>if 2.4.1 filled in</i> )	<b>a) Unit</b>	<b>number of map 10x10 km grid cells</b>
	It was agreed between the Countryside Agencies that the 10x10 km grid was the best unit to use because it was comparable with the last reporting round.	
	<b>b) Minimum</b>	<b>45</b>
	There are records of <i>Drepanocladus vernicosus</i> from 45 10x10 km squares in Wales between 1989 and 2012, and a further 11 have pre-1989 records.	
<b>2.4.3 Additional information on population estimates / conversion</b> Optional	<b>a) Definition of "locality"</b>	
	<b>b) Method to convert data</b>	
	<b>c) Problems encountered to provide population size estimation</b>	

<b>2.4.4 Year or period</b>	<b>1989-2012</b>	
	The exclusion of pre-2001 records would give an unrealistic impression of the distribution of <i>Drepanocladus vernicosus</i> in Wales because no sites with records from 1989-2000 are thought to have changed sufficiently in the interim to have lost the species.	
<b>2.4.5 Method used</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
<b>Population size</b>	Surveys between 1989 and 2012 covered the majority (80%) of 10x10 km squares in Wales with records of <i>Drepanocladus vernicosus</i> , so coverage is considered to be good over that time period.	
<b>2.4.6 Short-term trend</b>	<b>2001-2012</b>	
<b>Period</b>	It has been agreed that the UK should use 2001-2012 (2 reporting periods) to assess short-term trends.	
<b>2.4.7 Short-term trend</b>	<b>decrease &gt;1%/year</b>	
<b>Trend direction</b>	Comparison of the counts of 10x10 km squares between the current reporting period and the previous one suggests a 53% decline in <i>Drepanocladus vernicosus</i> , equating to >1% decline per year. This is entirely the result of a lack of return visits to many of the sites that were recorded in 2001-2006, about 50% of which are outside the Natura 2000 series and were found during routine bryophyte recording.	
<b>2.4.8 Short-term trend</b>	<b>a) Minimum</b>	<b>53</b>
<b>Magnitude</b>	This compares the number of 10x10km squares with records from 2007 to 2012 (15) with those with records from 2001 to 2006 (32).	
	<b>b) Maximum</b>	<b>53</b>
	<b>c) Confidence interval</b>	
<b>2.4.9 Short-term trend</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
<b>Method used</b>	The data for the short-term trend are very partial, because many sites that were discovered between 2001 and 2006 have not been revisited during the reporting period. There is nothing to indicate that these sites have changed ecologically and it is highly unlikely that <i>Drepanocladus vernicosus</i> has actually declined in the short-term. Ad hoc revisits to sites outside the Natura 2000 series in 2011 and 2012 indicate continued presence.	
<b>2.4.10 Long-term trend –</b>	<b>1989-2012</b>	
<b>Period</b>	It has been agreed that the UK should use 1989-2012 (4 reporting periods) to assess long-term trends.	

<b>2.4.11 Long-term trend</b> <b>Trend direction</b>	<b>increase</b>	
<b>2.4.12 Long-term trend</b> <b>Magnitude</b> Optional	<b>a) Minimum</b>	<b>61</b>
	This compares the number of 10x10km squares with records from 2001 to 2012 (37) with those with records from 2001 to 2006 (23).	
	<b>b) Maximum</b>	<b>61</b>
	<b>c) Confidence interval</b>	
<b>2.4.13 Long term trend</b> <b>Method used</b>	<b>3</b> The data for the long-term trend are relatively complete, because 80% of the 10x10 km squares in Wales with records of <i>Drepanocladus vernicosus</i> were visited during the period. However, there was relatively far more recording between 2001 and 2012 than between 1989 and 2000, so the apparent trend is an artefact.	
<b>2.4.14 Favourable</b> <b>reference population</b>	<b>a) Number of individuals/agreed exceptions/other units</b>	
	<b>b) Operator</b>	
	<b>c) FRP is unknown indicated by "true"</b>	<b>True</b>
	<b>d) Method used to set FRP</b>	<b>No favourable reference population has been set because of difficulties in deciding how large a sustainable population would need to be.</b>
	Individual populations of <i>Drepanocladus vernicosus</i> vary by several orders of magnitude, from a few 10s of shoots in one flush to 10,000s of shoots in a large flush complex. A 10x10 km square record could be based on a tiny population, or several large ones: the Supporting Information shows how some of the 10x10 km squares in south Wales have <i>Drepanocladus vernicosus</i> in a number of different 1x1 km squares, whereas most 10x10 km squares in north Wales are represented by records from just a single 1x1 km square. Setting a	

	reference population at the 10x10 km square level is impractical.	
<b>2.4.15 Reason for change</b> Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	<b>a) Genuine change?</b>	<b>False</b>
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	The 10x10km square count for the whole UK was 49 (between 1990 and 2006) and there are now records from 45 10x10km squares in Wales alone (between 1990 and 2012). Others have been added elsewhere in the UK as well.	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

<b>2.5 Habitat for the species</b>		
<b>2.5.1 Area estimation</b>	<b>0.003</b>	
	see Note for 2.5.3  There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.	
<b>2.5.2 Year or period</b>	<b>1989-2012</b>	
<b>2.5.3 Method used</b> <b>Habitat for the species</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
	The method for calculating the Surface Area of currently occupied habitat is presented in the Supporting Information (Bosanquet, 2012)	
<b>2.5.4 Quality of the habitat</b>	<b>a) Habitat quality</b>	<b>Good</b>
	see note for 2.5.4b	
	<b>b) Assessment method</b>	<b>Examination of SAC monitoring reports</b>
	SAC monitoring reports indicate that flushes in which <i>Drepanocladus vernicosus</i> grows are almost always good quality, floristically rich examples of neutral flush or fen vegetation. The species declines in, or is lost from, stands that are dominated by bulk species such as <i>Carex acutiformis</i> , <i>C. paniculata</i> , <i>Juncus acutiflorus</i> and <i>Molinia caerulea</i> , from drained fens and flushes, and from vegetation that is suffering significant nutrient enrichment or inundation.	
<b>2.5.5 Short-term trend Period</b>	<b>2001-2012</b>	
	It has been agreed that the UK should use 2001-2012 (2 reporting periods) to assess short-term trends.	

<b>2.5.6 Short-term trend</b>	<b>stable</b>	
<b>Trend direction</b>	The area of suitable habitat is believed to be stable in the short-term because no known colonies have been lost since 2001.	
<b>2.5.7 Long-term trend</b>	<b>1989-2012</b>	
<b>Period</b>	It has been agreed that the UK should use 1989-2012 (4 reporting periods) to assess long-term trends.	
<b>2.5.8 Long-term trend</b>	<b>decrease</b>	
<b>Trend direction</b>	Observations suggest that there is likely to have been some decline in the extent of <i>Drepanocladus vernicosus</i> colonies because of lack of grazing on some sites, although this has not been documented sufficiently to allow any figures to be attached.	
<b>2.5.9 Area of suitable habitat for the species</b>	<b>a) Value in km<sup>2</sup></b>	
	<b>b) Absence of data indicated as '0'</b>	
<b>2.5.10 Reason for change</b> Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	<b>a) Genuine change?</b>	<b>False</b>
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	No figure was given in the last reporting round, but knowledge has improved to a certain extent since then, especially because of SAC monitoring visits to some of Wales' largest <i>Drepanocladus vernicosus</i> colonies.	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

<b>2.6 Main pressures</b>		
<b>a) Pressure</b>	<b>b) Ranking</b>	<b>c) Pollution qualifier</b>
	H = high importance M = medium importance L = low importance	
A04: grazing	H	
I02: problematic native species	H	
J02: human induced changes in hydraulic conditions	H	
K02: Biocenotic evolution, succession	H	
A01: Cultivation	M	
A07: use of biocides, hormones and chemicals	M	

A08: Fertilisation	M	
B01: forest planting on open ground	M	
D02: Utility and service lines	M	
G04: Military use and civil unrest	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	M	
H04: Air pollution, air-borne pollutants	M	
K01: abiotic (slow) natural processes	M	
E03: Discharges	L	
F04: Taking / Removal of terrestrial plants, general	L	
G01: Outdoor sports and leisure activities, recreational activities	L	
L08: inundation (natural processes)	L	

A01 - cultivation adjacent to colonies can modify hydrology, nutrients & grazing levels  
 A04 - grazing is critical to the retention of open conditions necessary for the species  
 A07 - the herbicide Asulam has been aerially sprayed on land close to one *D vernicosus* site  
 A08 - fertilisation encourages competitive plant growth  
 B01 - some colonies were lost in the past (pre-1990) because of forestry  
 D02 - two pipelines across Wales passed close to *D vernicosus* flushes recently  
 E03 - the impacts of discharges are unknown but are likely to favour competitive species  
 F04 - the threat of collection is minimal, but *D vernicosus* is still on Schedule 8  
 G01 - walkers cause localised poaching at some upland-edge sites  
 G04 - trampling by military personnel has been noted on Mynydd Epynt SAC  
 H01 - the effects of water pollution on *D vernicosus* are unknown  
 H04 - the impacts of air pollution are unknown but are likely to favour competitive species  
 I02 - bulky plants are threats, especially *Carex paniculata*  
 J02 - drainage is a very significant threat  
 K01 - abiotic processes may affect the springs that feed *D vernicosus* flushes  
 K02 - succession often favours bulkier species than *D vernicosus*  
 L08 - some fen colonies are threatened by rising water levels or flooding from adjacent streams

<b>2.6.1 Method used – Pressures</b>	<b>based exclusively or to a larger extent on real data from sites/occurrences or other data sources</b>
	Examination of SAC monitoring reports and extensive field observations

<b>2.7 Threats</b>		
<b>a) Threat</b>	<b>b) Ranking</b>	<b>c) Pollution qualifier</b>
	H = high importance M = medium importance L = low importance	
A04: grazing	H	
B01: forest planting on open ground	H	

I02: problematic native species	H	
J02: human induced changes in hydraulic conditions	H	
K02: Biocenotic evolution, succession	H	
A01: Cultivation	M	
A07: use of biocides, hormones and chemicals	M	
A08: Fertilisation	M	
D02: Utility and service lines	M	
G04: Military use and civil unrest	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	M	
H04: Air pollution, air-borne pollutants	M	
K01: abiotic (slow) natural processes	M	
E03: Discharges	L	
F04: Taking / Removal of terrestrial plants, general	L	
G01: Outdoor sports and leisure activities, recreational activities	L	
L08: inundation (natural processes)	L	

All of the current pressures are likely to continue into the future. The threat from forestry is likely to increase because of government targets for tree planting. Because *D. vernicosus* is primarily a boreal species it may suffer particularly from climate change.

**2.7.1 Method used – Threats**

**expert opinion**

No modelling is available for this species

**2.8 Complementary information**

**2.8.1 Justification of % thresholds for trends**

<b>2.8.2 Other relevant information</b>	
<b>2.8.3 Trans-boundary assessment</b>	

### 2.9 Conclusions (*assessment of conservation status at end of reporting period*)

Please refer to the United Kingdom assessment for this species.

### 3 Natura 2000 coverage & conservation measures - Annex II species (*only applies to species listed under Annex II of the Directive*)

<b>3.1 Population</b>		
<b>3.1.1 Population size</b>  Estimation of population size included <u>in the SAC network</u>	<b>a) Unit</b>	<b>number of map 10x10 km grid cells</b>
	The same unit as was used at the national level is used here, although because of the level of detail available on <i>Drepanocladus vernicosus</i> in the Natura 2000 network, it is also possible to report at the 1x1km square level.	
	<b>b) Minimum</b>	<b>14</b>
	14 10x10km squares and/or 35 1x1km squares contain colonies of <i>Drepanocladus vernicosus</i> that lie within the Natura 2000 network (see Supporting Information Table 1).	
	<b>c) Maximum</b>	<b>14</b>
<b>3.1.2 Method used</b>	<b>Complete survey/Complete survey or a statistically robust estimate</b>	
	All but 1 of the 10x10km squares and all but 4 of the 1x1km squares with <i>Drepanocladus vernicosus</i> in the Natura 2000 network have been visited since 2001, three of the remaining 1x1km squares since 1999, and the final site was last visited in 1991 because it lies in the middle of a firing range and is now inaccessible.	
<b>3.1.3 Trend of population size within the network</b> (short-term trend)	<b>stable</b>	
	SAC monitoring indicates that all recorded populations survive, there have been some apparent increases (for example by the Afon Llafar in Eryri SAC) and some slight declines (for example in one part of Corsydd Eifionydd SAC, although that has been balanced by two newly discovered patches there). Overall the species seems to be stable in the Natura 2000 network.	

<b>3.2 Conservation measures</b>															
Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.															
3.2.1 Measure	3.2.2 Type					3.2.3 Ranking  H = high importance M = medium importance L = low importance	3.2.4 Location  where the measure is PRIMARILY applied			3.2.5 Broad evaluation of the measure					
	a) Legal/statutory	b) Administrative	c) Contractual	d) Recurrent	e) One-off		a) Inside	b) Outside	c) Both inside & outside	a) Maintain	b) Enhance	c) Long term	d) No effect	e) Unknown	f) Not evaluated
2.1: Maintaining grasslands and other open habitats			Y	Y		H			Y	Y	Y	Y			
6.1: Establish protected areas/sites					Y	H	Y			Y		Y			
6.3: Legal protection of habitats and species					Y	M			Y	Y		Y			
6.5: Adaptation/abolition of military land use				Y		H	Y			Y					

2.1 - grazing is maintained on most Natura 2000 sites with *Drepanocladus vernicosus*, and has been actively encouraged on Preseli SAC, Rhos Llawr Cwrt SAC and Eryri SAC. Some compartments at Corsydd Eifionydd SAC and Mynydd Epynt SAC require the reintroduction of grazing.

6.1 - the Natura 2000 series helps to conserve *Drepanocladus vernicosus*

6.3 - *Drepanocladus vernicosus* is on Schedule 8 of the Wildlife & Countryside Act and is therefore specially protected, so some developments have been re-routed to avoid damage to colonies.

6.5 - there has been specific guidance on Mynydd Epynt SAC to avoid trampling and ordnance explosions around the *Drepanocladus vernicosus* colonies