

**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:

S1400 - Large white-moss (*Leucobryum glaucum*)

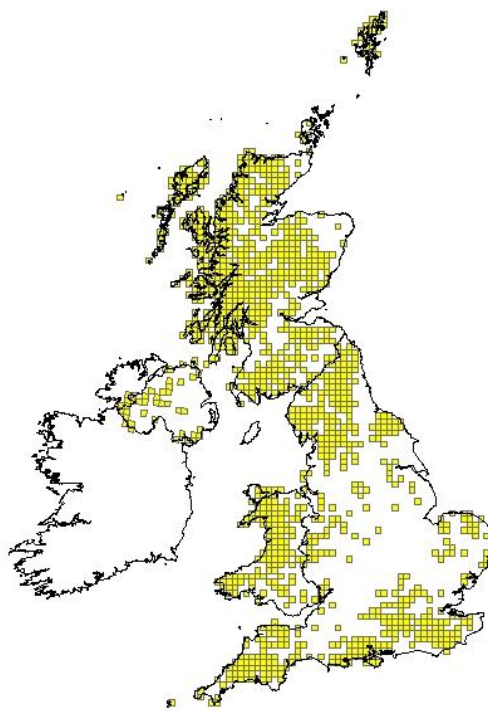
IMPORTANT NOTE – PLEASE READ

- 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 **Scottish Natural Heritage** and refers only to the state of the habitat/species in **Scotland** - 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.

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>	
0.2 Species	0.2.1 Species code	S1400
	0.2.2 Species scientific name	<i>Leucobryum glaucum</i>
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	Large white-moss

1.1 Maps		
1.1.1 Distribution map		Sensitive False
	<p><i>Leucobryum glaucum</i> is a common plant in Scotland with records from most areas but it is scarce in the central belt and apparently so in much of Aberdeenshire and Caithness. In the west it is locally common and sometimes abundant in both mire areas and in woodland, where there may be some confusion with <i>Leucobryum juniperoideum</i>. There is some evidence in the distributional and recording data for the UK that indicates that <i>Leucobryum glaucum</i> has not been seen recently in a number of hectads from which it was recorded prior to 1980 and this is also true in Scotland.</p>	



1.1.2 Method used - map	Estimate based on partial data with some extrapolation and/or modelling
	NBN Gateway data: British Bryological Society GA000144

1.1.3 Year or period	2007-2012
1.1.4 Additional distribution map	False
1.1.5 Range map	

2.1 Biogeographical region & marine regions	ATL
2.2 Published sources	<p>"Rothero, G.P. (2012) Surveillance of priority bryophytes in Scotland 2010-2013: <i>Leucobryum glaucum</i>. Unpublished report to Scottish Natural Heritage. Inverness.</p> <p>And references therein."</p> <p>Rothero, G.P. (2012) Surveillance of priority bryophytes in Scotland 2010-2013: <i>Leucobryum glaucum</i>. Unpublished report to Scottish Natural Heritage. Inverness.</p> <p>And references therein.</p>

2.3 Range	
2.3.1 Surface area Range	<p><i>Leucobryum glaucum</i> is a common plant in Scotland with records from most areas but it is scarce in the central belt and apparently so in much of Aberdeenshire and Caithness. In the west it is locally common and sometimes abundant in both mire areas and in woodland, where there may be some confusion with <i>Leucobryum juniperoideum</i>. There is some evidence in the distributional and recording data for the UK that indicates that <i>Leucobryum glaucum</i> has not been seen recently in a number of hectads from which it was recorded prior to 1980 and this is also true in Scotland.</p>
2.3.2 Method used Surface area of Range	<p>Estimate based on partial data with some extrapolation and/or modelling</p> <p>NBN Gateway data: British Bryological Society GA000144</p>
2.3.3 Short-term trend Period	<p>2001-2012</p> <p>Comparison of 2001-2006 with 2007-2012 data</p>
2.3.4 Short term trend Trend direction	stable
2.3.5 Short-term trend Magnitude	<p>a) Minimum</p> <p>NBN Gateway data: British Bryological Society GA000144</p> <p>There has been no apparent change in the overall range of this species in Scotland in the short-term.</p>

	b) Maximum	
2.3.6 Long-term trend Period	1960-2012	
2.3.7 Long-term trend Trend direction	stable	
2.3.8 Long-term trend Magnitude Optional	a) Minimum	
	<p>Rothero, G.P. (2012) Surveillance of priority bryophytes in Scotland 2010-2013: <i>Leucobryum glaucum</i>. Unpublished report to Scottish Natural Heritage. Inverness.</p> <p>Comparison of 10 km square distribution maps for each decade from 1960 to present. Maps 3 to 7 show the hectads (10 km squares) in which <i>Leucobryum glaucum</i> was recorded in each of the five decades using data from the NBN (which differs in detail from the BBS data in BRC). There is considerable variation in the detail of the hectads in which <i>Leucobryum glaucum</i> was recorded in each of the decades but this can largely be explained by the geographical focus of recording effort in each of the decades. In the 1980s for instance, an effort was made to cover as much ground as possible for the bryophyte atlas (published in 1990) while in the last decade much effort has been made to get to relatively under-recorded areas, avoiding areas that are well-recorded.</p>	
	b) Maximum	
2.3.9 Favourable reference range	a) Value in km²	
	b) Operator for FRR	
	c) FRR is unknown (indicated by "true")	False
	d) Method used to set FRR	
2.3.10 Reason for change Is the difference between the	a) Genuine change?	False

reported value in 2.3.1 and the previous reporting round mainly due to...		
	b) Improved knowledge/more accurate data?	False
	c) Use of different method (e.g. "Range tool")?	False

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	a) Unit	
	b) Minimum	
	c) Maximum	
2.4.2 Population size estimation (using population unit other than individuals) Optional (<i>if 2.4.1 filled in</i>)	a) Unit	number of map 10x10 km grid cells
	b) Minimum	605
	c) Maximum	605
2.4.3 Additional information on population estimates / conversion Optional	a) Definition of "locality"	
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	2007-2012	
2.4.5 Method used Population size	Complete survey/Complete survey or a statistically robust estimate	
	NBN Gateway data: British Bryological Society GA000144 Leucobryum glaucum is a common plant in Scotland with records from most areas but it is scarce in the central belt and apparently so in much	

	of Aberdeenshire and Caithness. In the west it is locally common and sometimes abundant in both mire areas and in woodland, where there may be some confusion with <i>Leucobryum juniperoideum</i> . There is some evidence in the distributional and recording data for the UK that indicates that <i>Leucobryum glaucum</i> has not been seen recently in a number of hectads from which it was recorded prior to 1980 and this is also true in Scotland.	
2.4.6 Short-term trend Period	2001-2012	
	Comparison of 2001-2006 with 2007-2012 data	
2.4.7 Short-term trend Trend direction	stable	
2.4.8 Short-term trend Magnitude	a) Minimum	
	32% increase between reporting periods based on population unit counts in the two periods	
	b) Maximum	
	32% increase between reporting periods based on population unit counts in the two periods	
	c) Confidence interval	32
	Trend not significantly different from 0 given the great variability in recording effort.	
2.4.9 Short-term trend Method used	Estimate based on expert opinion with no or minimal sampling	
	NBN Gateway data: British Bryological Society GA000144 A 132% increase has been calculated by comparing the number of 10km squares in 2001-2006 with those recorded in 2007-2012 i.e. $((605-459)/459)*100$. However this is more likely to be due to variation in recording effort than a genuine increase.	
2.4.10 Long-term trend – Period	1960-2012	
2.4.11 Long-term trend Trend direction	stable	
2.4.12 Long-term trend Magnitude Optional	a) Minimum	0
	b) Maximum	0
	c) Confidence	

	interval	
	Moderate	
2.4.13 Long term trend Method used	2	
	<p>Rothero (2012) using data from the BBS database via BRC The figure below shows the total number of hectads for which <i>Leucobryum glaucum</i> was recorded compared with similar data for all bryophytes. This gives a visual comparison of the frequency of hectad records for <i>Leucobryum glaucum</i> in relation to the level of bryophyte recording effort. This broadly indicates that there has been little variation the occurrence of the moss in hectads compared with all bryophytes, varying between 29% of recorded hectads in the first decade to 26% in the most recent</p>	
2.4.14 Favourable reference population	a) Number of individuals/agreed exceptions/other units	
	b) Operator	
	c) FRP is unknown indicated by "true"	False
	d) Method used to set FRP	
	a) Genuine change?	False
	b) Improved knowledge/more accurate data?	False
2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	c) Use of different method (e.g. "Range tool")?	False

2.5 Habitat for the species**2.5.1 Area estimation**

Leucobryum glaucum has a fairly wide ecological range but is most common on peaty soils in mires and on wetter heaths and in acid

	<p>woodland and in all these habitats it can be locally frequent. The following Annex 1 habitat types are therefore most relevant to this species:</p> <p>H4010 – Northern Atlantic wet heaths with <i>Erica tetralix</i> H7130 – Blanket bogs H7140 – Transition mires and quaking bogs H91C0 – Caledonian forest</p> <p>It is unknown whether the amount of habitat in the UK is sufficient to support a viable population of the species. The species is currently so widespread that the answer must be YES</p> <p>It is unknown whether the amount of habitat in the UK is sufficient to support a viable population of the species.</p>	
2.5.2 Year or period	1960-2012	
2.5.3 Method used		
Habitat for the species		
2.5.4 Quality of the habitat	a) Habitat quality	Moderate
	<p>Estimate based on wide distribution of species (good) compared with A17 habitat assessments from SSSIs (bad) e.g. 83% of SSSIs are in unfavourable condition for a key habitat, H4010 Northern Atlantic wet heaths.</p> <p>SNH A17 dossiers for:</p> <p>H4010 – Northern Atlantic wet heaths with <i>Erica tetralix</i> H7130 – Blanket bogs H7140 – Transition mires and quaking bogs H91C0 – Caledonian forest</p> <p>Rothero (2012)</p>	
	b) Assessment method	<p>SNH A17 dossiers for:</p> <p>H4010 – Northern Atlantic wet heaths with <i>Erica tetralix</i> H7130 – Blanket bogs H7140 – Transition mires and quaking bogs H91C0 – Caledonian forest</p> <p>Rothero (2012)</p>
	As for section 2.3	
2.5.5 Short-term trend Period		
2.5.6 Short-term trend Trend direction	<p>unknown</p> <p>Unknown, but see SNH A17 dossiers for: H4010 – Northern Atlantic wet heaths with <i>Erica tetralix</i> H7130 – Blanket bogs</p>	

	H7140 – Transition mires and quaking bogs H91C0 – Caledonian forest	
2.5.7 Long-term trend Period		
2.5.8 Long-term trend Trend direction	unknown	
2.5.9 Area of suitable habitat for the species	a) Value in km²	
	The area of suitable habitat within 10 km squares where the species has been recorded is unknown. A coarse estimate would be to give the area of land covered by 10 km square records i.e. 60,500 km ² , but this isn't very meaningful.	
	b) Absence of data indicated as '0'	
2.5.10 Reason for change Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	a) Genuine change?	False
	b) Improved knowledge/more accurate data?	False
	c) Use of different method (e.g. "Range tool")?	False

2.6 Main pressures		
a) Pressure	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
A04: grazing	H	
F03: Hunting and collection of wild animals (terrestrial)	H	
J01: fire and fire suppression	H	
B01: forest planting on open ground	M	
C03: Renewable abiotic energy use	M	
H04: Air pollution, air-borne pollutants	M	N
I02: problematic native species	M	

Muirburn has an impact on *Leucobryum glaucum*, particularly where the fire gets too hot and burns down to

the underlying peat. Fire tends to favour vascular-plant cover at the expense of bryophyte cover, with heather being encouraged in the east of Scotland while in the west and north, species such as deer grass and purple moor grass are encouraged. Most of the research into fire and vegetation dynamics has tended to focus on the relationship between fire and heather or grassland management, rather than the relationship between fire and bryophyte cover. It is probable that, over time, such regular burning encourages dry heath over blanket bog with a consequent loss of stands of *Leucobryum glaucum*.

Woodland expansion, through both planting and natural regeneration, results in loss of wet heath. Several tree species, both native and non-native, can tolerate the wet acid soil conditions, and indeed large areas of this habitat were lost to afforestation in the past. This continues, albeit at present on a smaller scale than previously, and with a shift towards native woodland rather than exotic conifers. Primarily occurring in the wider countryside, loss also occurs on designated sites, including on SACs where Scottish Government has taken the decision that one qualifying habitat can be favoured over another, for example to allow expansion of the priority habitat H91CO Caledonian Forest.

Bracken invasion affects H4010 in several locations, and although bracken will not generally invade waterlogged soils, some wet heath occurs on soils that are not permanently wet and which bracken can invade.

2.6.1 Method used – Pressures	mainly based on expert judgement and other data
	Rothero 2012 SNH A17 Habitat dossiers

2.7 Threats		
a) Threat	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
A04: grazing	H	
B01: forest planting on open ground	H	
F03: Hunting and collection of wild animals (terrestrial)	H	
J01: fire and fire suppression	H	
C03: Renewable abiotic energy use	M	
H04: Air pollution, air-borne pollutants	M	N
I02: problematic native species	M	

The historic threats have been from drainage and ground preparation for agriculture and silviculture and from commercial peat extraction. Drainage of areas of wet heath and blanket bog even in quite remote areas when grants were available. In the 1970s and 1980s much peatland was planted with commercial crops of conifers with the probable loss of many stands of *Leucobryum glaucum*, although the moss does occur in open areas in plantation woodland. Planting on deep peat has now mostly ceased but heathland

with stands of *Leucobryum glaucum* may be under threat from the current strategic decision to increase the area of commercial forest in Scotland. Commercial peat extraction still continues on a small number of sites but this should gradually fade as licenses end. Bogs have been cut-over for domestic fuel for thousands of years but it is unlikely that this local use has had much of an impact on *Leucobryum glaucum*.

The changes to the hydrology of large areas brought about by the infrastructure of roads and drainage for wind farms may have some impact on *Leucobryum glaucum* populations but indirect impacts such as this may take many years to manifest themselves as changes in the species composition and structure of the vegetation. The inclusion of *Leucobryum glaucum* on Annex V of the Habitats and Species Directive was as a result of fears of harvesting by the horticultural industry for floral displays. In Scotland, there is a small amount of harvesting of bryophytes for the horticultural industry and this will include some *Leucobryum glaucum*, but it is not easy to ascertain how big an enterprise this is as small companies seem to come and go.

2.7.1 Method used – Threats	expert opinion
	Rothero 2012 SNH A17 Habitat dossiers

2.8 Complementary information

2.8.1 Justification of % thresholds for trends

2.8.2 Other relevant information

No further relevant information.

2.8.3 Trans-boundary assessment

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*)

3.1 Population

3.1.1 Population size

Estimation of population size included in the SAC network

a) Unit

b) Minimum

c) Maximum

3.1.2 Method used	
3.1.3 Trend of population size within the network (short-term trend)	

3.2 Conservation measures															
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