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

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the species:

S6216 - Slender green feather- moss (*Hamatocaulis vernicosus*)

SCOTLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this species is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species) and/or (iv) the field was only relevant at UK-level (sections 9 Future prospects and 10 Conclusions).
- For technical reasons, the country-level future trends for Range, Population and Habitat for the species are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Scotland information only)**
1.2 Species code	**6216**
1.3 Species scientific name	**Hamatocaulis vernicosus**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Slender green feather- moss

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1994-2017
2.3 Distribution map	Yes
2.4 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.5 Additional maps	No

3. Information related to Annex V Species (Art. 14)

3.1 Is the species taken in the wild/exploited?	No	
3.2 Which of the measures in Art. 14 have been taken?	a) regulations regarding access to property	No
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	No
	c) regulation of the periods and/or methods of taking specimens	No
	d) application of hunting and fishing rules which take account of the conservation of such populations	No
	e) establishment of a system of licences for taking specimens or of quotas	No
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	No
	g) breeding in captivity of animal species as well as artificial propagation of plant species	No
	h) other measures	No

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3.3 Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit

b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
Min. (raw, ie. not rounded)						
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

3.4. Hunting bag or quantity taken in the wild Method used

3.5. Additional information

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

Main data source/review: Hodgetts, N. & Phillips, S. 2018 Surveillance of priority bryophytes in Scotland 2010-2013: Hamatocaulis vernicosus. Unpublished report to SNH.
National Biodiversity Network Atlas Scotland, (https://scotland.nbnatlas.org/) accessed on the 20th December 2017 using data from the British Bryological Society datasets dr859 and dr924.
The Data Provider, Original Recorder [where identified], and the NBN Trust bear no responsibility for any further analysis or interpretation of the data and/or information.
Records from Payne, S. (2017) pers comm
Records from Hodgetts, N. (2015) pers comm.

5. Range

5.1 Surface area (km²)

5.2 Short-term trend Period

5.3 Short-term trend Direction

Uncertain (u)

5.4 Short-term trend Magnitude

a) Minimum

b) Maximum

5.5 Short-term trend Method used

5.6 Long-term trend Period

5.7 Long-term trend Direction

5.8 Long-term trend Magnitude

a) Minimum

b) Maximum

5.9 Long-term trend Method used

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5.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown d) Method	
5.11 Change and reason for change in surface area of range	Improved knowledge/more accurate data The change is mainly due to:	Improved knowledge/more accurate data
5.12 Additional information	There has been a slight increase in the western extent of the species' range in Scotland due to the discovery of large populations on Tiree. This is undoubtedly due to new survey effort rather than a genuine range expansion because the moss is found at a number of localities in abundance.	

6. Population

6.1 Year or period	1994-2017	
6.2 Population size (in reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of map 1x1 km grid cells (grids1x1) 56
6.3 Type of estimate	Best estimate	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of map 10x10 km grid cells (grids10x10) 28
6.5 Type of estimate	Best estimate	
6.6 Population size Method used	Based mainly on extrapolation from a limited amount of data	
6.7 Short-term trend Period	2007-2018	
6.8 Short-term trend Direction	Uncertain (u)	
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.10 Short-term trend Method used	Insufficient or no data available	
6.11 Long-term trend Period	1994-2017	
6.12 Long-term trend Direction	Uncertain (u)	
6.13 Long-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.14 Long-term trend Method used	Insufficient or no data available	

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6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method	
6.16 Change and reason for change in population size	Improved knowledge/more accurate data The change is mainly due to:	Improved knowledge/more accurate data
6.17 Additional information		

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)?	Unknown
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Unknown
7.2 Sufficiency of area and quality of occupied habitat Method used	Insufficient or no data available	
7.3 Short-term trend Period	2007-2018	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Insufficient or no data available	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information		

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Extensive grazing or undergrazing by livestock (A10)	M
Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) (B27)	M
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M
Agricultural activities generating point source pollution to surface or ground waters (A25)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	M
Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) (B27)	H

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Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M
Agricultural activities generating point source pollution to surface or ground waters (A25)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	H

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken
9.2 Main purpose of the measures taken		Restore the habitat of the species (related to 'Habitat for the species')
9.3 Location of the measures taken		Only inside Natura 2000
9.4 Response to the measures		Long-term results (after 2030)

9.5 List of main conservation measures

Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)
Other measures related to forestry practices (CB15)

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters

a) Range
b) Population
c) Habitat of the species

10.2 Additional information

11. Conclusions

11.1. Range

11.2. Population

11.3. Habitat for the species

11.4. Future prospects

11.5 Overall assessment of Conservation Status

11.6 Overall trend in Conservation Status

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11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
11.8 Additional information	

12. Natura 2000 (pSCIs, SCIs and SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network (on the biogeographical/marine level including all sites where the species is present)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	16
12.2 Type of estimate	Minimum	
12.3 Population size inside the network Method used	Based mainly on extrapolation from a limited amount of data	
12.4 Short-term trend of population size within the network Direction	Uncertain (u)	
12.5 Short-term trend of population size within the network Method used	Insufficient or no data available	
12.6 Additional information	Two SACs have Hamatocaulis as a feature but neither have been surveyed by a professional bryologist in this period. However, the most recent survey suggests that the moss may have been lost from one SAC but is doing very well, with thousands of shoots, at another. Within these two SAC's there are likely still four occupied 1-km squares at one site. Many SACs have potential habitat for the moss but have not been surveyed for it. The value of 16 includes 1-km squares at other SACs that do not have this species as a recognised feature.	

13. Complementary information

13.1 Justification of % thresholds for trends	
13.2 Trans-boundary assessment	
13.3 Other relevant Information	

Distribution Map

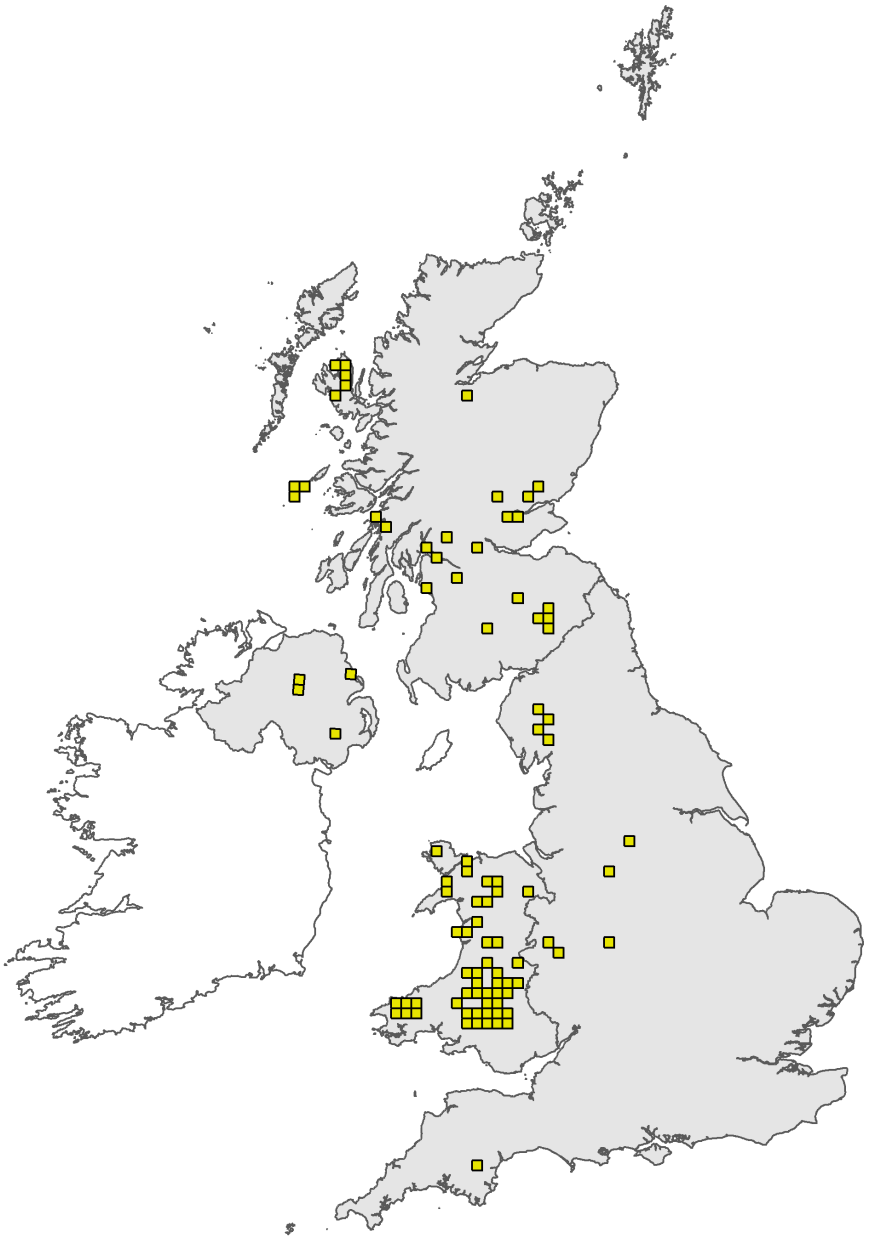

Figure 1: UK distribution map for S6216 - Slender green feather- moss (*Hamatocaulis vernicosus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available species records within the current reporting period. For further details see the 2019 Article 17 UK Approach document.

Range Map

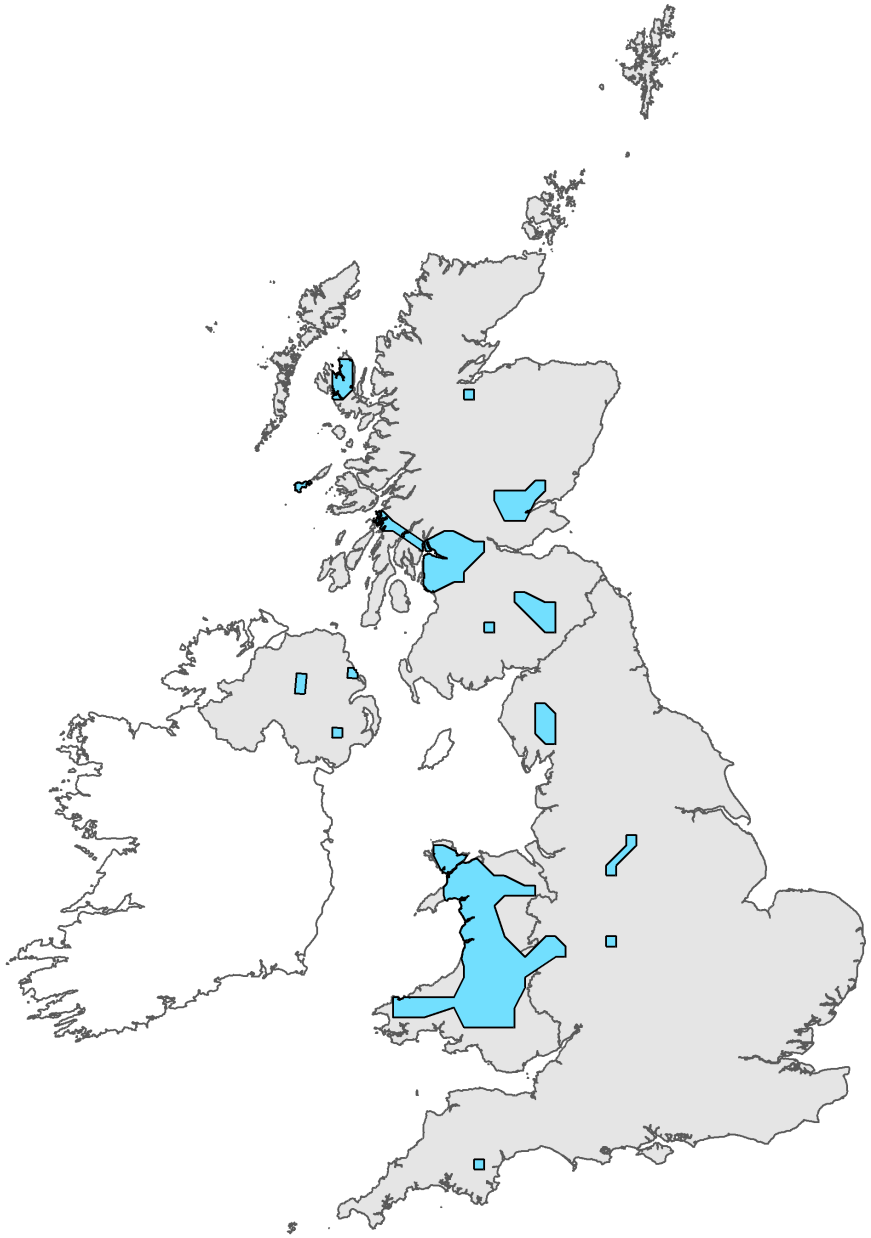

Figure 2: UK range map for S6216 - Slender green feather- moss (*Hamatocaulis vernicosus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 20km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: Hamatocaulis vernicosus (6216)

Field label	Note
2.2 Year or Period	1994 - 2017
2.4 Distribution map; Method used	NBN + recent records not on NBN

Species name: Hamatocaulis vernicosus (6216) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	The absolute trend in records is 'Increasing' however, as indicated in 6.16e this is due to improved knowledge rather than a real increase. The true trend is undoubtedly 'uncertain'. This is because though new records have come to light, the species has likely 'always' been in these locations, and does not represent any real expansion. Repeat surveys are rare and so loss of sites is also not adequately understood.
5.11 Change and reason for change in surface area of range	New records have come to light, the species has likely 'always' been in these locations, and does not represent any real expansion.
6.1 Year or Period	1994-2018 period used because populations are not surveyed very frequently and using just the last couple of years, or even the period covered by this reporting cycle would leave large gaps which are only due to lack of recording.
6.2 Population size	There are 56 occupied 1km grid cells. Although the EC reporting unit for Hv is occupied 1km grid cells, it was felt that this doesn't fully represent the population size of this species because so many of the occupied 1km grid cells within a 10km grid cell would not have a record in them due to surveyor effort. Therefore, it is suggested by JNCC that for population size we use the number of occupied 10km grid cells - same as 2013. There are 28 unique 10km grid cells.
6.3 Type of estimate	Best estimate of known population size where data is assumed to be incomplete.
6.8 Short term trend; Direction	There has been an increase in the number of recorded 1-km and 10-km squares in Scotland since the previous reporting period. However, this is primarily due to the discovery of large populations on Tiree. This increase is undoubtedly due to new survey effort rather than a genuine increase in population. It is also unlikely that we have discovered >75% of the species population in Scotland because potential habitat for thie species is disperse and difficult to map. The trend is therefore recorded as 'Uncertain'.
6.9 Short term trend; Magnitude	The magnitude is not reported here because the trend is uncertain. There was, however, an observed (not real) 137% increase in 10-km records.
6.13 Long term trend; Magnitude	The magnitude is not reported here because the trend is uncertain. There was, however, an observed (not real) 172% increase in 10-km records.
6.17 Additional information	This note relates to 6.18 - Age structure, mortality and reproduction. Hamatocaulis vernicosus has not been recorded with reproductive capsules in Scotland in this reporting period. In general, capsule production is rare Reproduction and dispersal is usually through vegetative means, either from leaf or shoot fragments (British Bryological Society, 2014).
7.1 Sufficiency of area and quality of occupied habitat	Tends to inhabit mires which are mineral-rich but not strongly calcareous. Most appropriate Annex 1 habitat type is Alkaline fens though these are not the only habitat occupied by this species. It is unknown whether the amount of habitat in the UK is sufficient to support a viable population of the species.

8.1 Characterisation of pressures/ threats	Possible changes in agri-environment subsidies may result in a decline in upland sheep farming, , which could ameliorate the threat of over-grazing to this particular species. Forestry activities: one site in SAC possibly affected by Loch edge drying out due to nearby conifer plantation. Diffuse pollution: one site in SAC possibly affected by diffuse pollution from nearby improved fields.
9.1 Status of measures	Some measures being implemented on a small number of (SAC) sites. The vast majority of sites are outwith designated sites and pressures and threats are largely unknown and with no measures targeted.
9.5 List of main conservation measures	CB15: Forestry: Other Measures relates to the drying out of neighbouring ground close to forest plantings and the invasion of conifer seedlings into the moss's habitat at one SAC. This is being addressed through updated management agreements. CA03/5: have been included because monitoring at one SAC noted that the areas of known bryological importance, area 2, would probably benefit from heavier grazing. The site will be monitored and grazing adjusted appropriately. CA11: Some evidence of eutrophication in the Branxholme Wester Loch part of the SAC, and some poaching due to cattle trampling at Slaidhills Moss. The impacts are being monitored and management agreement reviewed accordingly.
10.1 Future prospects of parameters	The future prospects of this species are largely unknown for a number of reasons. Firstly, the microhabitat is difficult to relate to any national habitat assessments (see 7.1 notes); secondly we are still discovering substantial well established new populations, so cannot comment on all the drivers of change acting on these and future populations discovered; and finally we do not know enough about how pollution/eutrophication will affect this species due to lack of data and uncertainties about future agri-forestry policies and incentives.
12.1 Population size inside the pSCIs, SCIs and SACs network	Records within SACs are found with 7 different 1km grid squares, and 4 different 10km grid squares.
12.2 Type of estimate	From known records.
12.3 Population size inside the network; Method used	No ideal fit so have chosen Based mainly on extrapolation from a limited amount of data as the known records are unlikely to be a complete picture of the true existence of the species.
12.4 Short term trend of the population size within the network; Direction	Sites monitored so infrequently that trends are uncertain. At Whitlaw and Branxholme SAC the species hasn't been seen at one of the two component SSSIs since 2002, but is rarely monitored.
12.5 Short term trend of population size within the network; Method used	Sites monitored so infrequently that trends are uncertain.