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:

S6985 - Killarney fern (*Vandenboschia speciosa*)

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	**6985**
1.3 Species scientific name	**Vandenboschia speciosa**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Killarney fern

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1990-2017
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

Commissioned report - Batty, B. D, Rumsey, F.J. 2018. Survey of Trichomanes speciosum (Killarney Fern) in Scotland, Scottish Natural Heritage Commissioned Report No. - in prep
Scottish SNH-funded BSBI records (dr654) - Records provided by Scottish SNH-funded BSBI records, accessed through NBN Atlas website.
Preston, C.D., Pearman, D.A. & Dines, T.D. 2002. New atlas of the British and Irish flora. Oxford University Press, Oxford.
NBN Atlas website at http://www.nbnatlas.org Accessed 28 June 2018.
Botanical Society of Britain & Ireland (dp91) - Records provided by Botanical Society of Britain & Ireland, accessed through NBN Atlas website.
Other BSBI Scottish data up to 2012 (dr655) - Records provided by Other BSBI Scottish data up to 2012, accessed through NBN Atlas website.

5. Range

5.1 Surface area (km²)

5.2 Short-term trend Period

5.3 Short-term trend Direction

Stable (0)

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

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5.9 Long-term trend Method used	
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	No change The change is mainly due to:
5.12 Additional information	

6. Population

6.1 Year or period	2017	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	1482
	c) Maximum	1487
	d) Best single value	1484
6.3 Type of estimate	95% confidence interval	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	number of map 10x10 km grid cells (grids10x10)
	b) Minimum	59
	c) Maximum	
	d) Best single value	
6.5 Type of estimate	Best estimate	
6.6 Population size Method used	Complete survey or a statistically robust estimate	
6.7 Short-term trend Period	2007-2017	
6.8 Short-term trend Direction	Stable (0)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	0
	c) Confidence interval	
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate	
6.11 Long-term trend Period	1987-2017	
6.12 Long-term trend Direction	Stable (0)	
6.13 Long-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.14 Long-term trend Method used		
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method	

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6.16 Change and reason for change in population size	No change The change is mainly due to:
6.17 Additional information	A comprehensive survey of the sporophytes and suitable locations informed the detailed population figures, the wider data from the NBN reflects the distribution of the gametophyte, for which there has not been a survey.

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)?	Yes
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on expert opinion with very limited data	
7.3 Short-term trend Period	2013-2017	
7.4 Short-term trend Direction	Stable (0)	
7.5 Short-term trend Method used	Complete survey or a statistically robust estimate	
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

Threat	Ranking
Collapse of terrain, landslide (M05)	M

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	Maintain the current range, population and/or habitat for the species	
9.3 Location of the measures taken	Both inside and outside Natura 2000	
9.4 Response to the measures	Short-term results (within the current reporting period, 2013-2018)	
9.5 List of main conservation measures		

Maintain existing traditional forest management and exploitation practices (CB02)

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Control/eradication of illegal killing, fishing and harvesting (CG04)

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	
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 individuals (i)
	b) Minimum	1482
	c) Maximum	1487
	d) Best single value	1484
12.2 Type of estimate	95% confidence interval	
12.3 Population size inside the network Method used	Complete survey or a statistically robust estimate	
12.4 Short-term trend of population size within the network Direction	Stable (0)	
12.5 Short-term trend of population size within the network Method used	Complete survey or a statistically robust estimate	

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12.6 Additional information

13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

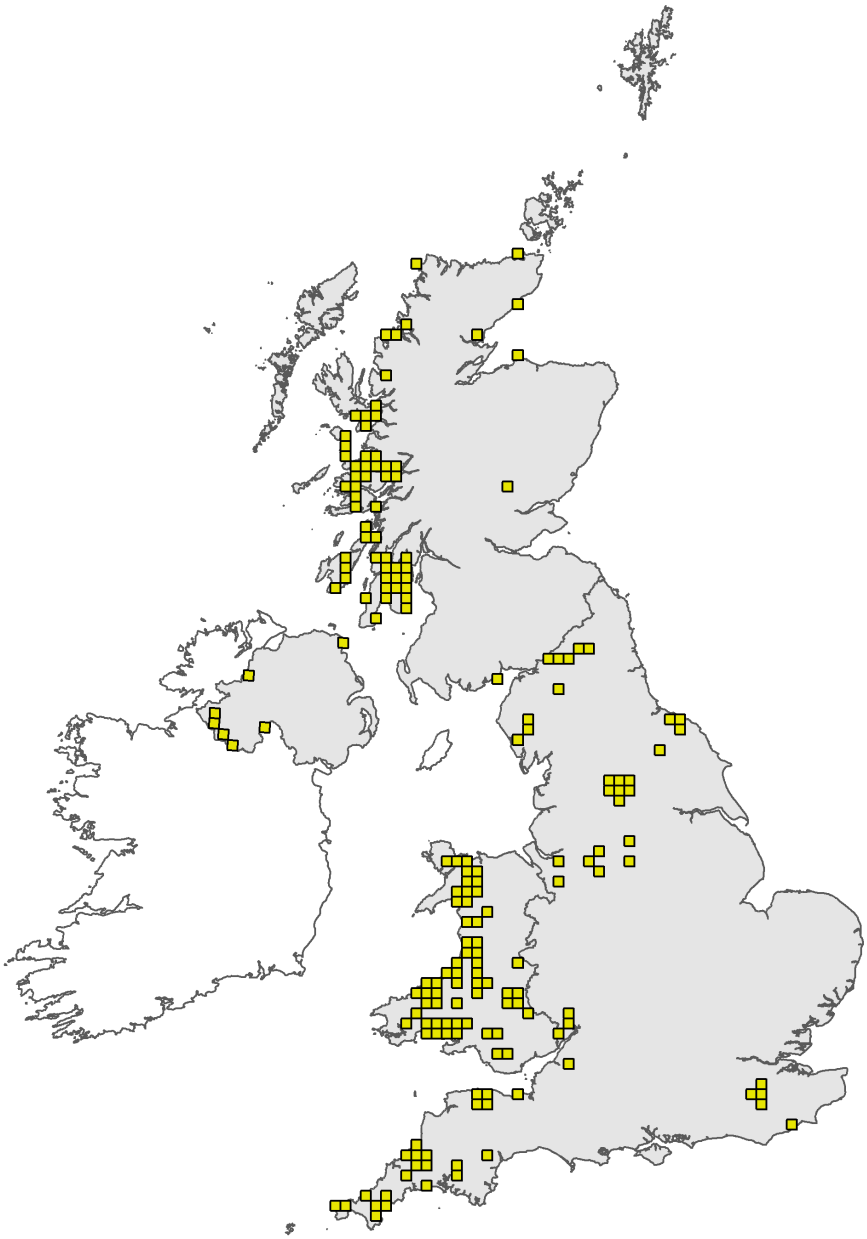

Figure 1: UK distribution map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

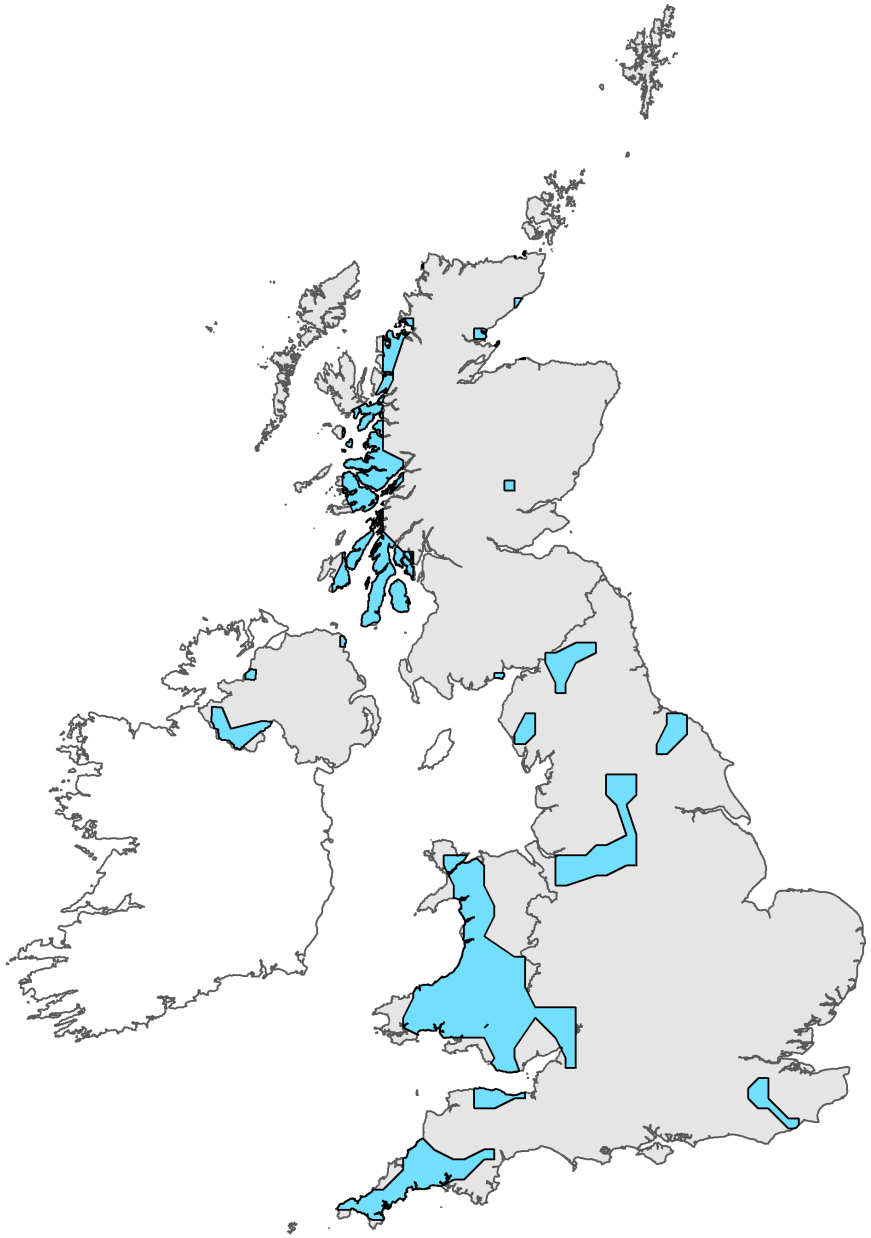

Figure 2: UK range map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: Vandenboschia speciosa (6985)

Field label	Note
2.3 Distribution map	Uses detailed data for sporophyte distribution but NBN atlas for the gametophyte distribution, one historic location collected during last reporting round but only recently made available has been included - but this does not represent an increase in range, only an increase in knowledge.
2.4 Distribution map; Method used	Some 8 figure grid refs, combined with kilometre square distribution

Species name: Vandenboschia speciosa (6985) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	The population numbers of the sporophyte in the Commissioned report - (Batty, B. D, Rumsey, F.J. 2018. Survey of Trichomanes speciosum (Killarney Fern) in Scotland, Scottish Natural Heritage Commissioned Report No. - in prep). are small but there is a minor change with some individuals being lost whilst recruitment of new sprophytes is taking place resulting in an overall stable population
6.2 Population size	Individual sporophyes were counted at all known locations - another location which was inaccessible for a detailed count had an estimated 200 individual fronds - these have not been included in this count. Gametophytes may be widely distributed across Scotland and there is no individual population count for these.
6.6 Population size; Method used	A complete suvey (Commissioned report - Batty, B. D, Rumsey, F.J. 2018. Survey of Trichomanes speciosum (Killarney Fern) in Scotland, Scottish Natural Heritage Commissioned Report No. - in prep) for the Sporophyte. The gametophyte was captured from incidental recording scheme records at 10km grid squares rather than a dedicated survey.
6.7 Short term trend; Period	The population distribution and figures for the gametophyte has not changed since the previous reporting round and the sporophyte figures fluctuate but are considered to be stable, based on their numbers - this is not a statistical analysis as based on a complete survey.
6.11 Long term trend; Period	Detailed population counts going back to 1987 and 1993 two locations. The population distribution and figures for the gametophyte has not changed since the previous reporting round and the sporophyte figures fluctuate but are considered to be stable, based on their numbers - this is not a statistical analysis as based on a complete survey.
6.16 Change and reason for change in population size	There is a single extra 10km grid square location for the gametophyte now 59 compared with 58 in the last reporting round, however, the record is from the last reporting period, it just was not digitised in time, so there is no change since the last report.
6.17 Additional information	16.18 The reports of the sporophyte describe that the populations Age structure, mortality and reproduction do not deviate from what would be expected in these locations.
6.17 Additional information	Individual sporophyes were counted at all known locations - another location which was inaccessible for a detailed count had an estimated 200 individuals - these have not been included in this count, but would bring the total to 1684 sporophytes.

7.1 Sufficiency of area and quality of occupied habitat	The habitat and area supporting the sporophyte is of good quality and has statutory protection. There are other suitable areas, it is not known what is limiting the distribution. It is not specifically associated with an Annex 1 habitat type. This species occupies a specialist niche, in Scotland being reported from holes, caves and shaded crevices on cliffs. The sporophyte is restricted in Scotland to the south-west. The gametophyte is more widespread. Preston et al. (2002) states: 'The sporophyte occurs only in constantly damp, shaded localities, usually on acidic, but often base-flushed rocks, rarely on damp humic banks, and exceptionally as an epiphyte.' 'The gametophyte of T. speciosum grows deep in clefts, crevices and natural rock hollows on a range of acidic to neutral rocks. Such sites are dark (less than 1% ambient light) and are often humid, being located on sea-cliffs, river-cliffs or streamsides, or are kept damp through soil capillary action. The Commissioned report - (Batty, B. D, Rumsey, F.J. 2018. Survey of Trichomanes speciosum (Killarney Fern) in Scotland, Scottish Natural Heritage Commissioned Report No. - in prep) discussed natural process which may create and destroy suitable habitat niches for the sporophyte, diversion of a water course resulting from natural rock slips / trees rotting and collapsing all impact on the micrclimate, but on balance there is sufficient habitat available.
8.1 Characterisation of pressures/ threats	Landslides may have a medium impact locally on the species which given the limited distribution would have a nationally impact. All other pressures and threats have been assessed as low - so not included here.
9.2 Main purpose of the measures taken	Distribution of the sporophyte is very limited and this is what the conservation measures mainly refer to.
9.5 List of main conservation measures	Sporophyte populations are on known sites with known management, the management is favourable for them, but if it were to change it could have a significant impact.
10.1 Future prospects of parameters	The population and distribution of the sporophyte has been consistent for many years - threats from collection or accidental damage seem to be addressed, see Commissioned report - (Batty, B. D, Rumsey, F.J. 2018. Survey of Trichomanes speciosum (Killarney Fern) in Scotland, Scottish Natural Heritage Commissioned Report No. - in prep) and the gametophyte distribution may increase as a result of more survey effort rather than a real change in population.