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

Conservation status assessment for the species:

S6985 - Killarney fern (*Vandenboschia speciosa*)

UNITED KINGDOM

IMPORTANT NOTE - PLEASE READ

- The information in this document represents 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.
- It is based on supporting information provided by the geographically-relevant Statutory Nature Conservation Bodies, which is documented separately.
- The 2019 Article 17 UK Approach document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Maps showing the distribution and range of the species are included (where available).
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the UK assessments. Further underpinning explanatory notes are available in the related country-level reports.
- 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; and/or (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species).
- The UK-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**
1.2 Species code	**6985**
1.3 Species scientific name	**Vandenboschia speciosa**
1.4 Alternative species scientific name	Trichomanes speciosum
1.5 Common name (in national language)	Killarney fern

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1990-2018
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

England
RUMSEY, F.J., JERMY, A.C. & SHEFFIELD, E 1998 The independent gametophytic stage of Trichomanes speciosum Willd. (Hymenophyllaceae), the Killarney Fern and its distribution in the British Isles Watsonia 22, 1-19
TREWREN, K., 2003. Report on Surveys of the Killarney Fern (Trichomanes speciosum) in East Arncliff Wood and West Arncliff Wood, North York Moors - November 2002 to February 2003. English Nature unpublished report - IN STRICT CONFIDENCE
TREWREN, K., 2004. Report on the Status of the Killarney Fern (Trichomanes speciosum) in West Arncliff Wood, North York Moors (Third Annual Recording) - February 2004. English Nature unpublished report - IN STRICT CONFIDENCE
TREWREN, K., 2005. Survey to Determine the Status of the Killarney Fern (Trichomanes speciosum) in Northern Cumbria - February to April 2005. English Nature unpublished report - IN STRICT CONFIDENCE
TREWREN, K., 2005. Report on the Status of the Killarney Fern (Trichomanes speciosum) in Park Hole Wood, North York Moors, in 2005. English Nature unpublished report - IN STRICT CONFIDENCE
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RUMSEY, F.R. 2013 Trichomanes speciosum Willd., Killarney Fern, Sporophyte generation in England - A CONFIDENTIAL record of extant populations. NHM, London
RUMSEY, F.R. 2018 Trichomanes speciosum Willd. (syn. Vandenboschia speciosa (Willd.)Kunkel) Sporophyte, St. Nectan's Kieve, nr. Tintagel, E. Cornwall, VC.2 - a CONFIDENTIAL report to Natural England (April 2018).
Scotland
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.
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Rumsey, F.J., Farrar, D.R. & Sheffield, E. 1990. Filmy fern gametophytes in the

British Isles. Pteridologist 2: 40-42.
Rumsey, F.J. Jermy, A.C. 1998. The independent gametophytic stage of Trichomanes speciosum Willd. (Hymenophyllaceae), the Killarney Fern and its distribution in the British Isles. Watsonia 22: pages 1 - 19
Rumsey, F.J. 2012. Vandenboschia speciosa (Killarney fern) http://www.nhm.ac.uk/nature-online/species-of-the-day/biodiversity/endangered-species/vandenboschia-speciosa/index.html
Rumsey, F.J. 2017. A review and analysis of the sporophyte generation of the Killarney fern Vandenboschia speciosa (Willd.) Kunkel (syn. Trichomanes specisosum Wild.) in Wales. Confidential report to NRW.
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N.Ireland
Beesley, S. (2006). County Antrim Scarce, Rare and Extinct Vascular Plant Register. Ulster Museum. Belfast.
Curtis, T.G.F. & McGough, H.N. (1988) The Irish Red Data Book 1: Vascular Plants. Stationery Office, Dublin.
Hackney, P. 1992 Flora of the North-east of Ireland. Third Edition. Institute of Irish Studies, the Queen's University of Belfast.
Jermy, A.C. (1994) Trichomanes speciosum and its gametophyte in Ireland. Unpublished Report, Natural History Museum, London
Kingston, N. & Hayes, C. (2005) The ecology and conservation of the gametophyte generation of the Killarney Fern (Trichomanes speciosum Willd.) in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 105B(2): 71-79
Ni Dhuill, E., Smyth, N., Waldren, S. & Lynn, D. (2015) Monitoring methods for the Killarney Fern (Trichomanes speciosum Willd.) in Ireland. Irish Wildlife Manuals, No. 82. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
NPWS (2008) Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. Brunswick Press Limited. Dublin.
Ratcliffe, D.A., Birks, H.J.B. & Birks, H.H. (1993) The ecology and conservation of the Killarney Fern Trichomanes speciosum Willd. in Britain and Ireland. Biological Conservation 66: 231-247.
NIEA. Unpublished surveys and reports. Various years

5. Range

5.1 Surface area (km²)	32351.8	
5.2 Short-term trend Period	2007-2018	
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	Based mainly on extrapolation from a limited amount of data	
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)	30630
	b) Operator	
	c) Unknown	
	d) Method	The FRP is the same as in 2013. The value is considered to be large enough to support a viable population and no less than when the Habitats Directive came into force in the UK. For further information see the 2019 Article 17 UK Approach document.
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	The discovery of newly identified gametophyte localities in Wales has led to improved knowledge of the species range .	

6. Population

6.1 Year or period	2005-2018	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	
	c) Maximum	
	d) Best single value	3364
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	
6.5 Type of estimate		
6.6 Population size Method used	Complete survey or a statistically robust estimate	
6.7 Short-term trend Period	2007-2018	
6.8 Short-term trend Direction	Stable (0)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate	
6.11 Long-term trend Period		
6.12 Long-term trend Direction		
6.13 Long-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.14 Long-term trend Method used		

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6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size	
	b) Operator	Approximately equal to (≈)
	c) Unknown	
	d) Method	The FRR has changed since 2013. An FRR operator has been used because it has not been possible to calculate the exact FRR The FRR is approximately equal to the current range which is considered to be sufficient to maintain a viable population and is no less that when the Habitats Directive came into force in the UK. For further details see the 2019 Article 17 UK Approach document.
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	Population counts for this species tend to focus on the sporophyte generation, the exact distribution and therefore population of gametophytes is less well understood and documented.	

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (for long-term survival)?	Yes
	b) Is there a sufficiently large area of unoccupied habitat of suitable quality (for long-term survival)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	2007-2018	
7.4 Short-term trend Direction	Stable (0)	
7.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information	Whilst, sufficiency of habitat quantity and quality are important in the species survival, climatic conditions are also significant. Evidence has shown climatic conditions are important in the production of the sporophyte generation.	

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Use of plant protection chemicals in agriculture (A21)	M
Logging without replanting or natural regrowth (B05)	M
Clear-cutting, removal of all trees (B09)	M

Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Illegal harvesting, collecting and taking (G11)	M
Collapse of terrain, landslide (M05)	M

Threat	Ranking
Use of plant protection chemicals in agriculture (A21)	M
Logging without replanting or natural regrowth (B05)	M
Clear-cutting, removal of all trees (B09)	M
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Illegal harvesting, collecting and taking (G11)	M
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

Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
Maintain existing traditional forest management and exploitation practices (CB02)
Stop forest management and exploitation practices (CB06)
Adapt/manage extraction of non-energy resources (CC01)
Adapt/manage exploitation of energy resources (CC02)
Control/eradication of illegal killing, fishing and harvesting (CG04)

9.6 Additional information

10. Future prospects

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10.1 Future prospects of parameters	a) Range	Good
	b) Population	Good
	c) Habitat of the species	Good
10.2 Additional information	Future trend of Range is Overall stable; Future trend of Population is Overall stable; and Future trend of Habitat for the species is Overall stable. For further information on how future trends inform the Future Prospects conclusion see the 2019 Article 17 UK Approach document.	

11. Conclusions

11.1. Range	Favourable (FV)
11.2. Population	Favourable (FV)
11.3. Habitat for the species	Favourable (FV)
11.4. Future prospects	Favourable (FV)
11.5 Overall assessment of Conservation Status	Favourable (FV)
11.6 Overall trend in Conservation Status	Stable (=)
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	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable; and (ii) the current Range surface area is not less than the Favourable Reference Range. Conclusion on Population reached because: (i) the short-term trend direction in Population size is stable; and (ii) the current Population size is approximately equal to the Favourable Reference Population. Conclusion on Habitat for the species reached because: (i) the area of occupied and unoccupied habitat is sufficiently large and (ii) the habitat quality is suitable for the long-term survival of the species; and (iii) the short-term trend in area of habitat is stable. Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are good; and (iii) the Future prospects for Habitat for the species are good. Overall assessment of Conservation Status is Favourable because all of the conclusions is Favourable. Overall trend in Conservation Status is based on the combination of the short-term trends for Range - stable, Population - stable, and Habitat for the species - stable. Overall assessment of Conservation Status has not changed since 2013. Overall trend in Conservation Status has not changed since 2013.

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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	
	c) Maximum	
	d) Best single value	3333
12.2 Type of estimate		Best estimate
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
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

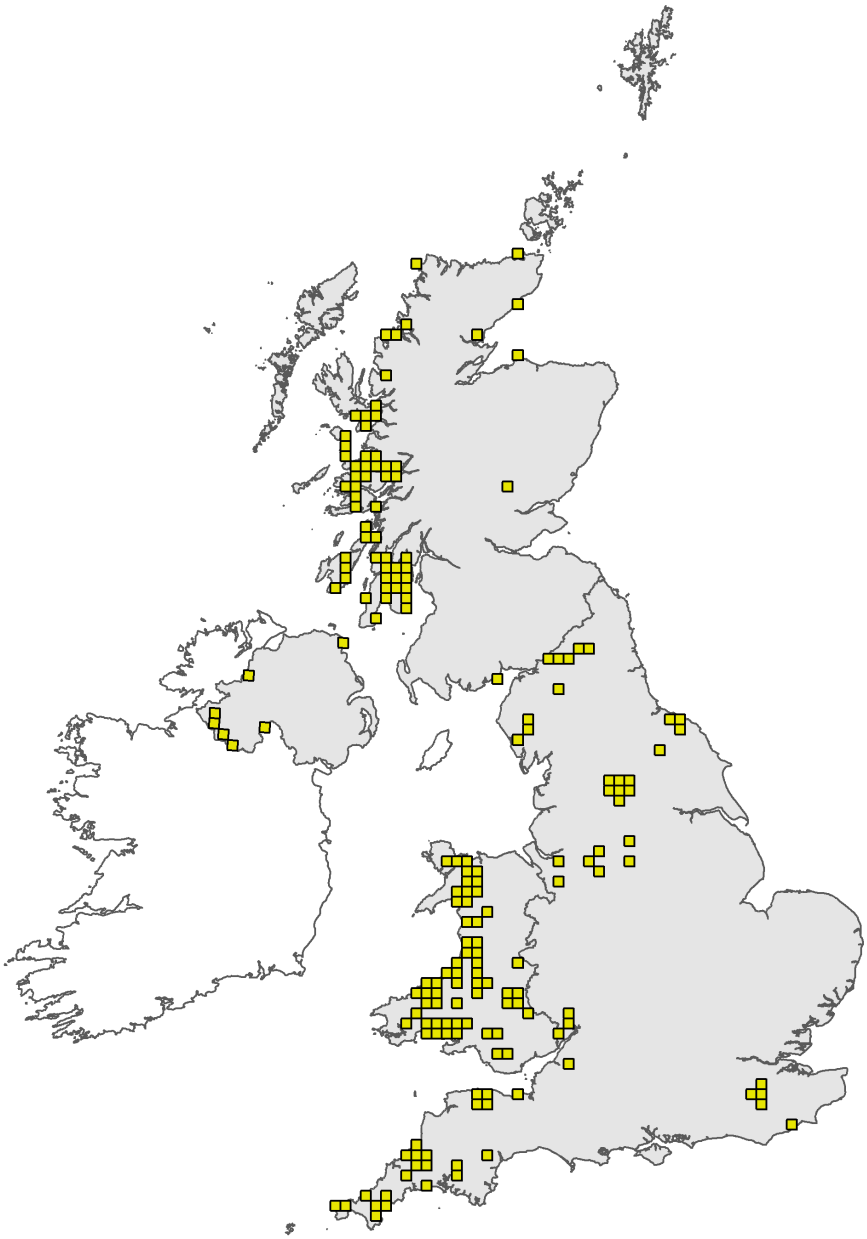

Figure 1: UK distribution map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

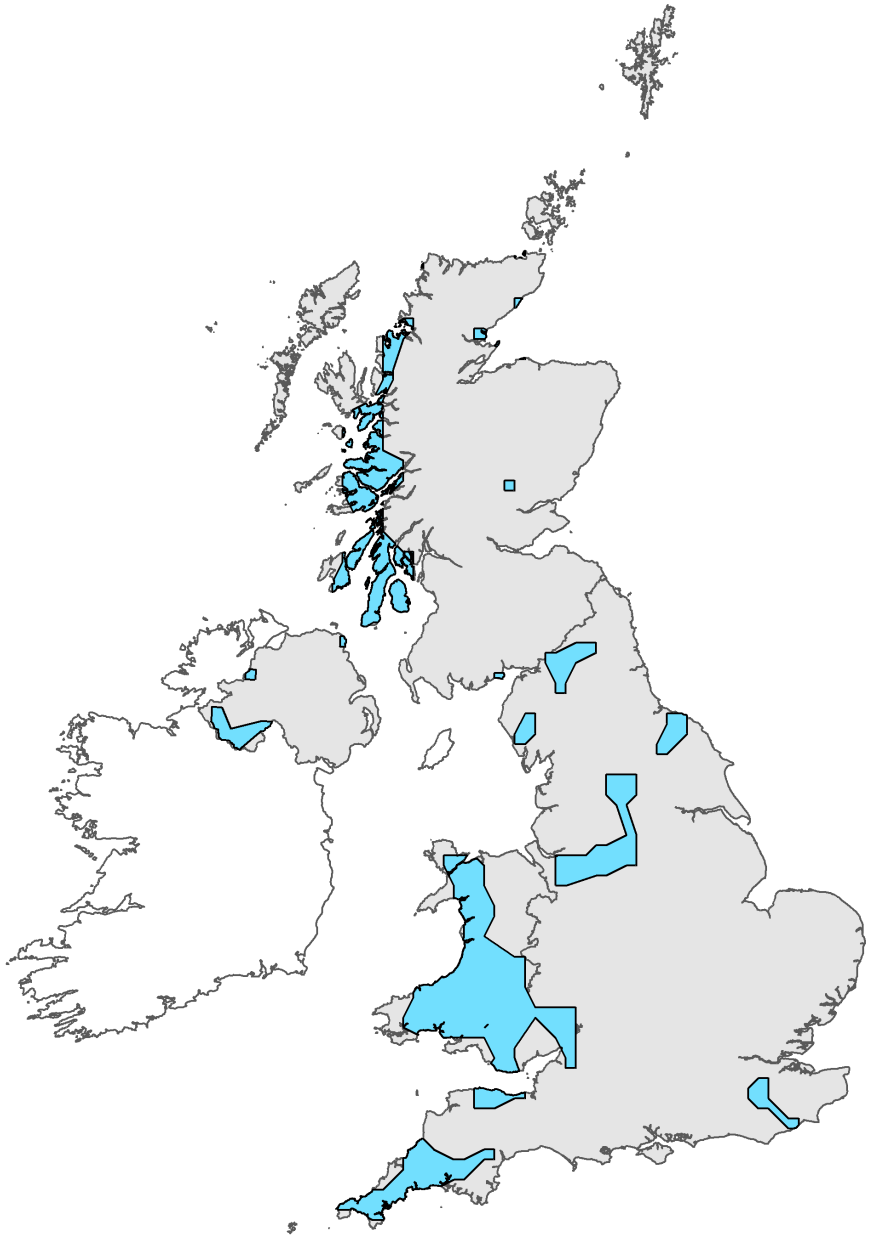

Figure 2: UK range map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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.