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*)

NORTHERN IRELAND

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 (Northern Ireland 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	2006-2018
2.3 Distribution map	Yes
2.4 Distribution map Method used	Complete survey or a statistically robust estimate
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

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

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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
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	2013-2018	
6.2 Population size (in reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of individuals (i) 4
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		

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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	
6.16 Change and reason for change in population size	No change The change is mainly due to:	
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)?	No
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Yes
7.2 Sufficiency of area and quality of occupied habitat Method used	Complete survey or a statistically robust estimate	
7.3 Short-term trend Period	2007-2018	
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

Pressure	Ranking
Reduced fecundity / genetic depression (e.g. inbreeding or endogamy) (L05)	M
Modification of hydrological flow (K04)	H
Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing) (G09)	H
Intrusive and destructive research and monitoring activities (H07)	H

Threat	Ranking
Droughts and decreases in precipitation due to climate change (N02)	H

Reduced fecundity / genetic depression (e.g. inbreeding or endogamy) (L05)	H
Modification of hydrological flow (K04)	H
Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing) (G09)	H
Intrusive and destructive research and monitoring activities (H07)	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: 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: Medium-term results (within the next two reporting periods, 2019-2030)

9.5 List of main conservation measures

Reinforce populations of species from the directives (CS01)
Implement climate change adaptation measures (CN02)
Reduce impact of multi-purpose hydrological changes (CJ02)
Reduce impact of mixed source pollution (CJ01)

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 individuals (i)
	b) Minimum	
	c) Maximum	
	d) Best single value	2
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

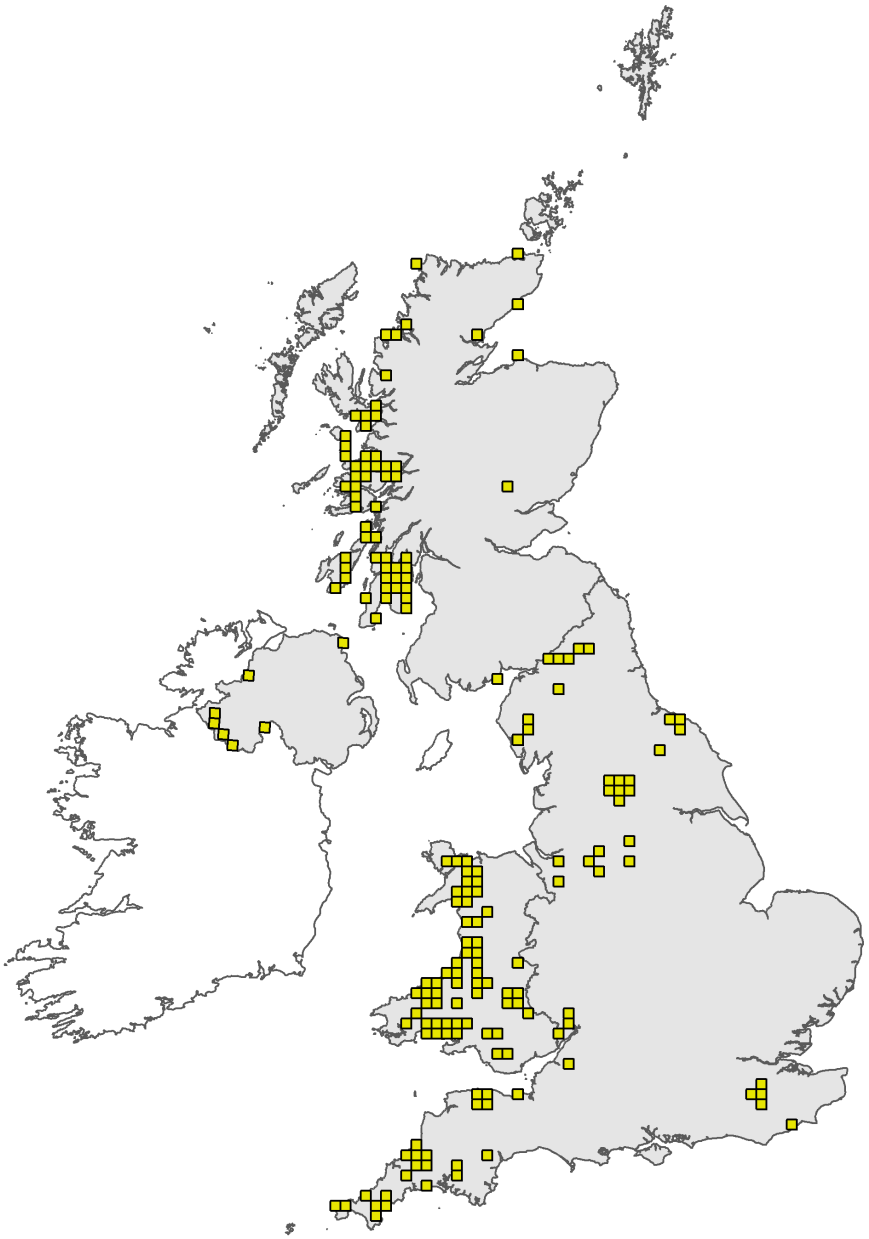

Figure 1: UK distribution map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

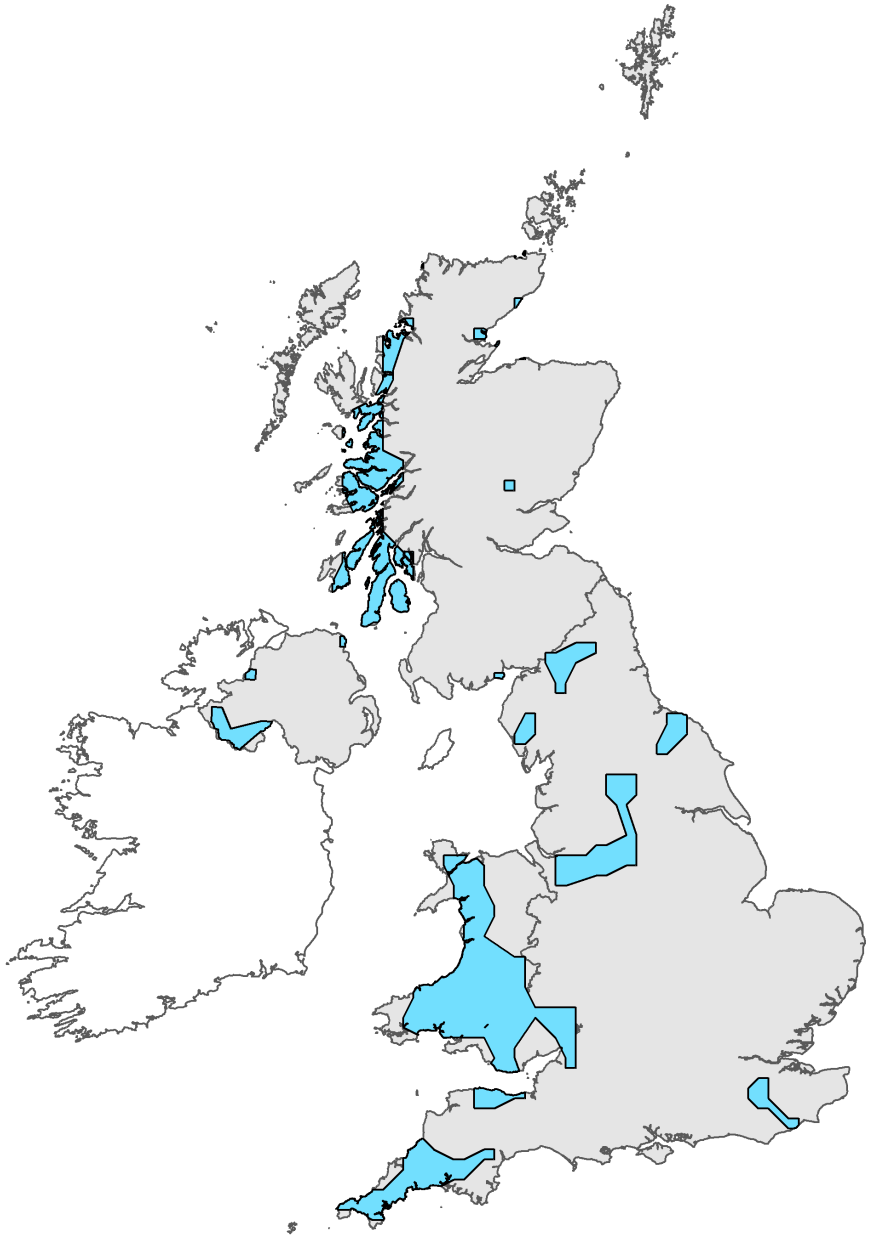

Figure 2: UK range map for S6985 - Killarney fern (*Vandenboschia speciosa*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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.

Explanatory Notes

Species name: Vandenboschia speciosa (6985)

Field label	Note
2.2 Year or Period	Due to poor recording of the gametophyte of this species, range map is based upon gametophyte data records from 2006.
2.3 Distribution map	Preston et al. (2002) provides good coverage for the whole of the UK. Note that the sporophyte is known from only two localities in NI and these sites have been visited on a regular basis. However, Trichomanes speciosum gametophytes are difficult to recognise, and under-recording has been, and is likely to continue to be a problem. The current trend is believed to be stable.

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

Field label	Note
6.2 Population size	Population size based upon the sporophyte as impossible to estimate numbers of gametophytes. Two sites with two plants at each site.
7.1 Sufficiency of area and quality of occupied habitat	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.' This is certainly true of the two colonies in NI, with one occurring in a small damp cave, and the other under flushed boulders. No estimates exist for the coverage of the habitats described above, but expert opinion would suggest that suitable habitats occur widely across NI.
8.1 Characterisation of pressures/ threats	Threats and Pressures listed as: Droughts and decreases in precipitation due to climate change, Reduced fecundity / genetic depression (e.g. inbreeding or endogamy), Modification of hydrological flow, Harvesting or collecting of other wild plants and animals , Intrusive and destructive research and monitoring activities. The collection of samples of T. speciosum in the past was arguably the single biggest threat to this species survival, and resulted in the loss of a number of populations and a major decline on the size of many others in the UK. This type of activity is still a potential problem, along with trampling and vegetation removal associated with botanising and photography. With such a small number of sporophytes in NI, the species is particularly vulnerable, although sites are not widely known. Modifications to the hydrology of a catchment or a habitat - through afforestation, development, etc - could have a detrimental effect on a population, as the species is very dependent upon water supply and water quality. There are concerns that very old gametophyte populations may have lost the ability to produce sporophytes - with only two colonies for the sporophyte and a handful of actual plants present, the potential for extinction in NI is particularly high. Further, with such small sporophyte populations, the impact of climate change is a serious threat, particularly if the delicate water balance that the species depends upon is affected by changes in rainfall.
11.5 Overall assessment of Conservation Status	Range is Favourable; Population has been assessed as Unfavourable Inadequate - given the tiny numbers of plants present at the 2 sporophyte colonies. The habitat for the species is currently assessed as Favourable (with no obvious immediate threats), and across NI there are other areas of suitable habitat. However, we have assessed Future Prospects as Unknown, on the basis that the two colonies are extremely vulnerable to extinction through natural or anthropogenic factors. Hence an overall assessment of Unfavourable Inadequate.

12.1 Population size inside the pSCIs, SCIs and SACs network	One site within SAC network; 2 plants.