

**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:

S1421 - Killarney fern (*Trichomanes speciosum*)

IMPORTANT NOTE – PLEASE READ

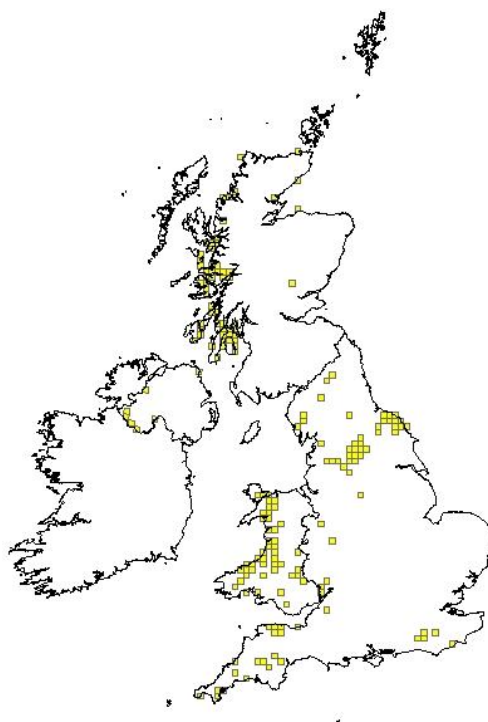
- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Northern Ireland Environment Agency** and refers only to the state of the habitat/species in **Northern Ireland** - it does 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	S1421
	0.2.2 Species scientific name	<i>Trichomanes speciosum</i>
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	Killarney Fern

1.1 Maps

1.1.1 Distribution map		Sensitive	False
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1.1.2 Method used - map	Complete survey/Complete survey or a statistically robust estimate
1.1.3 Year or period	2007-2012
1.1.4 Additional distribution map	False
1.1.5 Range map	

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2.1 Biogeographical region & marine regions	ATL
2.2 Published sources	<p>"Allen, D.E. (1969) <i>The Victorian Fern Craze</i>. Hutchinson, London.</p> <p>Colgan, N. & Scully, R.W. (1898) <i>Contributions towards a Cybele Hibernica</i>. 2nd Ed. Edward Ponsonby, Dublin.</p> <p>Curtis, T.G.F. & McGough, H.N. (1988) <i>The Irish Red Data Book 1: Vascular Plants</i>. Stationery Office, Dublin.</p> <p>Doyle, G.J. (1987) A new station for the Killarney fern (<i>Trichomanes speciosum</i> Willd.) in Killarney oakwoods (<i>Blechno-Quercetum</i>). <i>Irish Naturalists' Journal</i> 22: 353-356</p> <p>IUCN (2001) <i>IUCN Red List Categories & Criteria</i>. Version 3.1. IUCN, Gland.</p> <p>Jermy, A.C. (1994) <i>Trichomanes speciosum</i> and its gametophyte in Ireland. Unpublished Report, Natural History Museum, London</p> <p>Johnson, G.N., Rumsey, F.J., Headley, A.D. & Sheffield, E. (2000) Adaptations to extreme low light in the fern <i>Trichomanes speciosum</i>. <i>New Phytologist</i> 148: 423-431</p> <p>Kingston, N. & Hayes, C. (2005) The ecology and conservation of the gametophyte generation of the Killarney Fern (<i>Trichomanes speciosum</i> Willd.) in Ireland. <i>Biology and Environment: Proceedings of the Royal Irish Academy</i> 105B(2): 71-79</p> <p>Krippel, Y. (2001) Aire de répartition et statut de <i>Trichomanes speciosum</i> Willd. (Hymenophyllaceae) au Luxembourg. <i>Bulletin des Naturalistes Luxembourgeois</i> 102: 3-13</p> <p>NPWS (2008) <i>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</i>. Brunswick Press Limited. Dublin.</p> <p>Preston, C.D., Pearman, D.A. & Dines, T.D. (2002) <i>New Atlas of the British & Irish Flora</i>. Oxford University Press, Oxford.</p> <p>Ratcliffe, D.A., Birks, H.J.B. & Birks, H.H. (1993) The ecology and conservation of the Killarney Fern <i>Trichomanes speciosum</i> Willd. in Britain and Ireland. <i>Biological Conservation</i> 66: 231-247.</p> <p>Rumsey, F.J. (1994) The distribution and population biology of the Killarney fern (<i>Trichomanes speciosum</i> Willd.). Unpublished PhD thesis, University of Manchester.</p> <p>Rumsey, F.J., Gibby, M. & Vogel, J.C. (2002a) The UK Biodiversity Action Plan (BAP) process in action: the Killarney fern, <i>Trichomanes speciosum</i> Willd. – a case study. <i>Fern Gazette</i> 16: 344-349</p> <p>Rumsey, F.J., Headley, A.D., Farrar, D.R. & Sheffield, E. (1991) The Killarney fern (<i>Trichomanes speciosum</i>) in Yorkshire. <i>Naturalist</i> 116: 41-43</p> <p>Rumsey, F.J., Jermy, A.C. & Sheffield, E. (1998a) The independent gametophytic stage of <i>Trichomanes speciosum</i> Willd. (Hymenophyllaceae), the Killarney Fern and its distribution in the British Isles. <i>Watsonia</i> 22: 1-19</p> <p>Rumsey, F.J., Vogel, J.C., Russell, S.J., Barrett, J.A. & Gibby, M.</p>

	<p>(1998b) Climate, colonization and celibacy: population structure in Central European <i>Trichomanes speciosum</i> (Pteridophyta). <i>Botanica Acta</i> 111: 481-489</p> <p>Rumsey, F.J., Vogel, J.C., Russell, S.J., Barrett, J.A. & Gibby, M. (1999) Population structure and conservation biology of the endangered fern <i>Trichomanes speciosum</i> Willd. (Hymenophyllaceae) at its northern distributional limit. <i>Biological Journal of the Linnean Society</i> 66: 333-344</p> <p>Rumsey, F.J., Vogel, J.C., Russell, S.J., Barrett, J.A. & Gibby, M. (2002b) A review of progress towards the conservation of the Killarney fern (<i>Trichomanes speciosum</i> Willd.) in the British Isles. <i>Botanical Journal of Scotland</i> 54: 37-47</p> <p>Stace, C. A. (1997) <i>New Flora of the British Isles</i>, 2nd Ed. Cambridge University Press, Cambridge.</p> <p>Vogel, J.C., Jessen, S., Gibby, M., Jermy, A.C. & Ellis, L. (1993) Gametophytes of <i>Trichomanes speciosum</i> (Hymenophyllaceae: Pteridophyta) in Central Europe. <i>Fern Gazette</i> 14: 227-232"</p>

2.3 Range	
2.3.1 Surface area Range	
2.3.2 Method used Surface area of Range	Complete survey/ Complete survey or a statistically robust estimate
2.3.3 Short-term trend Period	2001-2012
2.3.4 Short term trend Trend direction	stable
2.3.5 Short-term trend Magnitude	a) Minimum
	b) Maximum
2.3.6 Long-term trend Period	1988-2012
2.3.7 Long-term trend Trend direction	stable
2.3.8 Long-term trend Magnitude Optional	a) Minimum

	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	<p>Preston et al. (2002) provides good coverage for the whole of the UK. Note that the sporophyte has been known from only two localities in NI and these sites have been visited on a regular basis. However, <i>Trichomanes speciosum</i> gametophytes are difficult to recognise, and under-recording has been, and is likely to continue to be a problem.</p> <p>The current trend is believed to be stable. The current range is not restricted, and therefore it is appropriate to set the current range as the favourable reference range. The current range is believed to be adequate to ensure the long term survival of the species.</p>
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to...	a) Genuine change?	False
		Change in range for NI due to inclusion of gametophyte records.
	b) Improved knowledge/more accurate data?	True
	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
	Population assessed as occupied 10km squares; sporophyte and gametophyte used.	
	b) Minimum	7
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	Estimate based on partial data with some extrapolation and/or modelling	
2.4.6 Short-term trend Period	2001-2012	
2.4.7 Short-term trend Trend direction	stable	
2.4.8 Short-term trend Magnitude	a) Minimum	
	b) Maximum	

	c) Confidence interval	
2.4.9 Short-term trend Method used	Estimate based on partial data with some extrapolation and/or modelling	
2.4.10 Long-term trend – Period	1988-2012	
2.4.11 Long-term trend Trend direction	stable	
2.4.12 Long-term trend Magnitude Optional	a) Minimum	
	b) Maximum	
	c) Confidence interval	
2.4.13 Long term trend Method used	2	
2.4.14 Favourable reference population	a) Number of individuals/agreed exceptions/other units	7
	b) Operator	
	c) FRP is unknown indicated by "true"	False
	d) Method used to set FRP	There have been concerns that very old gametophyte populations may have lost the ability to produce sporophytes. Further, many of the sporophyte populations are very small, and can be impacted by climatic conditions. However, based on expert opinion, the number of gametophyte populations is probably

		sufficient to ensure long-term viability, particularly if more of them start to produce sporophytes. The favourable reference population has therefore been set as equal to the current population.
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:	a) Genuine change?	False
	Change in population for NI due to inclusion of gametophyte records.	
	b) Improved knowledge/more accurate data?	True
	c) Use of different method (e.g. "Range tool")?	False

2.5 Habitat for the species		
2.5.1 Area estimation	0	
	<p>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 <i>T. speciosum</i> 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.</p> <p>No estimates exist for the coverage of the habitats described above.</p> <p>There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.</p>	
2.5.2 Year or period	2007-2012	
2.5.3 Method used Habitat for the species	Absent data	
2.5.4 Quality of the habitat	a) Habitat quality	Unknown
	b) Assessment method	Preston et al. (2002) states: "The sporophyte occurs only in constantly damp, shaded localities, usually on acidic, but often base-flushed rocks, rarely on

		<p>damp humic banks, and exceptionally as an epiphyte.”</p> <p>“The gametophyte of <i>T. speciosum</i> 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.”</p> <p>No estimates exist for the coverage of such habitats in NI.</p>
2.5.5 Short-term trend Period	2001-2012	
2.5.6 Short-term trend Trend direction	unknown	
2.5.7 Long-term trend Period	1988-2012	
2.5.8 Long-term trend Trend direction	unknown	
2.5.9 Area of suitable habitat for the species	a) Value in km²	0
	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	
F04: Taking / Removal of terrestrial plants, general	H	
K05: reduced fecundity/ genetic depression	H	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	
H02: Pollution to groundwater (point sources and diffuse sources)	L	
J02: human induced changes in hydraulic conditions	L	

F04 Taking / Removal of plants

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. 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 very vulnerable to plant collecting. Sites are not widely known.

J02 Human induced changes in hydrology

Modifications to the hydrology of a catchment or a habitat - through afforestation, development, etc - could have a detrimental effect on a population.

H01/H02 Water pollution

Species is very dependent upon water quality.

K05 Reduced fecundity/genetic depression

With two colonies for the sporophyte and only a handful of actual plants present, the potential for extinction is high.

2.6.1 Method used – Pressures

mainly based on expert judgement and other data

2.7 Threats

a) Threat	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
F03: Hunting and collection of wild animals (terrestrial)	H	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	H	
H02: Pollution to groundwater (point sources and diffuse)	H	

sources)		
J02: human induced changes in hydraulic conditions	H	
K05: reduced fecundity/ genetic depression	H	
M01: Changes in abiotic conditions	M	

Future threats include the current pressures listed under 2.6 - i.e. -

F04 Taking / Removal of plants
 J02 Human induced changes in hydrology
 H01/H02 Water pollution
 K05 Reduced fecundity/genetic depression

In addition, climate change is an unknown factor. It is thought that climate change may have halted the colonisation process of the species in central Europe which began several thousand years ago (Rumsey et al., 1998b) and that a slight shift to a warmer and wetter climate may place the gametophytes in an ideal position to extend again. Climate change in Ireland could therefore potentially result in an expansion of the species' range.

2.7.1 Method used – Threats	expert opinion
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2.8 Complementary information

2.8.1 Justification of % thresholds for trends

2.8.2 Other 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	number of map 10x10 km grid cells
	b) Minimum	1
	c) Maximum	1
	3.1.2 Method used	
3.1.3 Trend of population size within the network (short-term trend)		stable

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
4.1: Restoring/improving water quality	Y			Y		H			Y	Y	Y	Y			
4.1: Restoring/improving water quality	Y			Y		H			Y	Y	Y	Y			

7.1: Regulation/ Management of hunting and taking	Y			Y		H			Y	Y					
7.4: Specific single species or species group management measures	Y			Y		H			Y	Y	Y	Y			

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