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:

S1413 - Clubmosses (*Lycopodium* spp.)

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	**1413**
1.3 Species scientific name	**Lycopodium spp.**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Clubmosses

2. Maps

2.1 Sensitive species	No
2.2 Year or period	
2.3 Distribution map	No
2.4 Distribution map Method used	Insufficient or no data available
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

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

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

Cheffings, C.M. & Farrell, L. (eds.) 2005. The vascular plant Red Data List for Great Britain. Species Status 7: 1-116. Joint Nature Conservation Committee, Peterborough, with amendments up to years 10 & 11 (Leach, S.J. 2017. The Vascular Plant Red Data List for Great Britain: a summary of amendments in years 10 and 11 (2015-2016) of the annual amendments process. BSBI News 135: 59-62)
Dines, T. 2008. A Vascular Plant Red Data List for Wales, Rhestr o Blanhigion Fasgwlaidd Data Coch ar gyfer. Plantlife
Hackney, P. (accessed May 2018). Northern Ireland Priority Species: Lycopodiella inundata - marsh clubmoss.
http://www.habitas.org.uk/priority/species.asp?item=2001
Lockton, A.J. (accessed May 2018). Species account: Lycopodiella inundata. Botanical Society of the British Isles, www.bsbi.org.uk.
Online Atlas of the British and Irish flora. http://www.brc.ac.uk/plantatlas/
Preston, C.D., Pearman, D.A. & Dines, T.D. 2002. New Atlas of the British & Irish Flora. Oxford University Press.
Rumsey, F.J., 2007. An overlooked boreal clubmoss Lycopodium lagopus (Laest. ex Hartm.) Zinserl. ex Kusen. (Lycopodiaceae) in Britain. Watsonia 26, 477-480.
Stace, C. A., 2010. New Flora of the British Isles, Third Edition. Cambridge University Press
Stroh, P.A. 2013. England Rare and Scarce taxa. Botanical Society of Britain and Ireland.
Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. 2014. A Vascular Plant Red List for England. Botanical Society of Britain and

Ireland, Bristol.
Wyse Jackson, M., FitzPatrick, U., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

5. Range

5.1 Surface area (km²)	
5.2 Short-term trend Period	2013-2018
5.3 Short-term trend Direction	Unknown (x)
5.4 Short-term trend Magnitude	a) Minimum b) Maximum
5.5 Short-term trend Method used	Based mainly on expert opinion with very limited data
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 See comments under 5.12.
5.11 Change and reason for change in surface area of range	No change The change is mainly due to:
5.12 Additional information	No distribution map has been created for the 2019 reporting and therefore no Range surface area has been calculated/reported in 2019. In the 2013 reporting the Favourable Reference Range (FRR) was calculated as 98503.46 km2. The value was considered to be large enough to support a viable population and no lower than the range estimate when the Habitats Directive came into force in the UK. For further information see the 2019 Article 17 UK Approach document. In the reporting round in 2013, the Range was assessed as Favourable because its surface area was approximately equal to the FRR and, although the short term trend was unknown, there was no evidence of an overall short term decline. The current assessment includes four additional taxa, making comparisons with the FRR from the 2013 reporting round somewhat problematic. In spite of this, the inclusion of additional taxa in the group used in this assessment, two of them widespread, does not alter this overall picture significantly. The 2013 assessment can be found here: http://jncc.defra.gov.uk/page-6387.

6. Population

6.1 Year or period	
6.2 Population size (in reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value

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

6.3 Type of 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		
6.7 Short-term trend Period	2013-2018	
6.8 Short-term trend Direction	Unknown (x)	
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.10 Short-term trend Method used	Based mainly on expert opinion with very limited data	
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		
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method	 x In the 2013 reporting, there was insufficient information available for these species to be able to determine the Favourable Reference Population (FRP). The situation remains unchanged. In the 2019 reporting the FRP is therefore Unknown.
6.16 Change and reason for change in population size	No change The change is mainly due to:	
6.17 Additional information	Data collected within the current reporting period (2013-2018 are insufficient to determine whether the actual (collective) population size for the 2019 reporting round is any different to the population size estimate in the 2013 reporting. Given the relative frequency of occurrence and local abundance of members of the Lycopodiaceae (especially in the north and west of Britain), it was only possible to provide a proxy for Population in the 2013 reporting round, namely recorded occupancy of 10x10 km squares (which was recorded as 678 (minimum) to 727 (maximum) number of map 10x10 km grid cells). In the third reporting round in 2013, the Population parameter was assessed as Unknown because it was considered uncertain whether it was large enough to be viable and the short term trend was unknown. It seems unlikely that the populations of all but the rarest taxa are too small to be viable in the long term but short term trends remain unknown.	

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

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)?	Unknown
	b) Is there a sufficiently large area of unoccupied habitat of suitable quality (for long-term survival)?	Unknown
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	2013-2018	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Based mainly on expert opinion with very limited data	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information	Habitat for species has been assessed as Unknown, because although habitat quality is good, it is unknown if there is enough habitat quantity to support a viable population, and the short term trend is unknown.	

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Conversion into agricultural land (excluding drainage and burning) (A01)	M
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M
Intensive grazing or overgrazing by livestock (A09)	M
Application of synthetic (mineral) fertilisers on agricultural land (A20)	M
Drainage for use as agricultural land (A31)	M

Threat	Ranking
Conversion into agricultural land (excluding drainage and burning) (A01)	M
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M
Intensive grazing or overgrazing by livestock (A09)	M
Application of synthetic (mineral) fertilisers on agricultural land (A20)	M
Drainage for use as agricultural land (A31)	M

8.2 Sources of information

8.3 Additional information

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

9. Conservation measures

9.1 Status of measures	a) Are measures needed?	No
	b) Indicate the status of measures	
9.2 Main purpose of the measures taken		
9.3 Location of the measures taken		
9.4 Response to the measures		
9.5 List of main conservation measures		
9.6 Additional information	Conservation measures are only required to be reported for Annex II species. This group of species is not on Annex II.	

10. Future prospects

10.1 Future prospects of parameters	a) Range	Good
	b) Population	Unknown
	c) Habitat of the species	Poor
10.2 Additional information	Several pressures and threats to the species group are considered to be significant and not fully addressed by any existing conservation measures, and therefore the overall Future prospects of the species group are considered to be Unfavourable-inadequate. The overall Future prospects parameter conclusion is based on the future prospects of the other three parameters: for Range they are Good (extensive range in the UK); for Population they are Unknown; and for Habitat for the species they are Poor. The main threats are likely to be site specific, so it is uncertain if existing conservation measures cover these. Information about populations across most of the range is poor.	

11. Conclusions

11.1. Range	Favourable (FV)
11.2. Population	Unknown (XX)
11.3. Habitat for the species	Unknown (XX)
11.4. Future prospects	Unfavourable - Inadequate (U1)
11.5 Overall assessment of Conservation Status	Unfavourable - Inadequate (U1)
11.6 Overall trend in Conservation Status	Unknown (x)
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 Use of different method

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

	The change is mainly due to: Use of different method
11.8 Additional information	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is unknown; and (ii) the current Range surface area is approximately equal to the Favourable Reference Range. Conclusion on Population reached because: (i) the short-term trend direction in Population size is unknown; and (ii) the Favourable Reference Population is unknown. Conclusion on Habitat for the species reached because although: (i) the occupied and unoccupied habitat is of suitable quality for the long-term survival of the species; (ii) it is unknown if the area of occupied and unoccupied habitat is sufficiently large; and (iii) the short-term trend in area of habitat is unknown. Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are unknown; and (iii) the Future prospects for Habitat for the species are poor. Overall assessment of Conservation Status is Unfavourable-inadequate because one of the conclusions is Unfavourable-inadequate. Overall trend in Conservation Status is based on the combination of the short-term trends for Range - unknown, Population - unknown, and Habitat for the species - unknown. The Overall assessment of Conservation Status has not changed since 2013. The Overall trend in Conservation Status has changed between 2013 and 2019 because of the removal of the Future prospects trend from the 2019 method used to assess Overall trend, and also due to expert opinion.

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 b) Minimum c) Maximum d) Best single value
12.2 Type of estimate	
12.3 Population size inside the network Method used	
12.4 Short-term trend of population size within the network Direction	
12.5 Short-term trend of population size within the network Method used	
12.6 Additional information	This group of species is not on Annex II.

13. Complementary information

13.1 Justification of % thresholds for trends	
13.2 Trans-boundary assessment	
13.3 Other relevant Information	It is generally recognised that there are six species within this group in the UK:

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

Lycopodium alpinum, Lycopodium annotinum, Lycopodium clavatum, Lycopodium complanatum, Huperzia selago and Lycopodiella inundata. A seventh species, Lycopodium lagopus, was described by Rumsey in 2007, occurring alongside Lycopodium annotinum as a rarity in upland habitats, however its identification and status in the UK is still unresolved.

In the previous reporting round (2013) the UK interpreted 'Lycopodium spp.' strictly, only including the species (that were then) within the genus Lycopodium and not the other genera in Lycopodiaceae. These were the two well-known species L. clavatum and L. annotinum. L. lagopus was not fully included in the assessment. In the current round all constituent taxa of the Lycopodiaceae are included in the assessment, which brings in an additional four taxa that were not considered last time. Two of the additional taxa were then considered to be in the genus Diphasiastrum, but are now included within the genus Lycopodium on the EU checklist.

Lycopodium alpinum has the following synonyms: Diphasiastrum alpinum (L.) Holub; Diphasiastrum complanatum ssp. alpinum (L.) Jermy; Diphasium alpinum (L.) Rothm.
Lycopodium complanatum has the following synonyms: Diphasiastrum complanatum (L.) Holub; Diphasium complanatum (L.) Rothm.
Huperzia selago has the following synonyms: Lycopodium selago L.
Lycopodiella inundata has the following synonyms: Lepidotis inundata (L.) P. Beauv.; Lycopodium inundatum L.
Lycopodium annotinum & L. clavatum have no synonyms.