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:

S1395 - Petalwort (*Petalophyllum ralfsii*)

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	**1395**
1.3 Species scientific name	**Petalophyllum ralfsii**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Petalwort

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2013-2018
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

Atherton, I., Bosanquet, S., and Lawley, M. 2010. Mosses and Liverworts of Britain and Ireland- a field guide. British Bryological Society, Plymouth.
CHURCH, J.M., HODGETTS, N.G., PRESTON, C.D. & STEWART, N.F. 2001. British Red Data Books mosses and liverworts. Joint Nature Conservation Committee.
HOLYOAK, D.T. 2002. Petalwort Petalophyllum ralfsii: Report to Plantlife on work carried out in England and Wales during 2001 and 2002. Countryside Council for Wales/English Nature Contract Report.
Holyoak, D.T. 2003. The distribution of bryophytes in Ireland. An annotated review of the occurrence of liverworts and mosses in the Irish vice-counties based mainly on the records of the British Bryological Society. Dinas Powys, Vale of Glamorgan: Broadleaf Books.
Holyoak, D.T. 2006. Progress towards a species inventory for conservation of bryophytes in Ireland. Biology and Environment, Proceedings of the Royal Irish Academy 106B (3): 225-236.
Lockhart, B., Hodgetts, N. & Holyoak, D. (2012). Rare and threatened bryophytes of Ireland. National Museums Northern Ireland Publication No 028.
NIEA. Unpublished surveys and reports. Various years

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

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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	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	1
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	Decreasing (-)	
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 c) Unknown d) Method	
6.16 Change and reason for change in population size	Genuine change The change is mainly due to:	Genuine change
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	Decreasing (-)	
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)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Military, paramilitary or police exercises and operations on land (H01)	M
Modification of hydrological flow (K04)	H

Threat	Ranking
Reduced fecundity / genetic depression (e.g. inbreeding or endogamy) (L05)	H

Mixed source air pollution, air-borne pollutants (J03)	H
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Droughts and decreases in precipitation due to climate change (N02)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Military, paramilitary or police exercises and operations on land (H01)	M
Modification of hydrological flow (K04)	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: Restore the habitat of the species (related to 'Habitat for the species')

9.3 Location of the measures taken: Only inside 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

Reduce impact of mixed source pollution (CJ01)
Implement climate change adaptation measures (CN02)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Reinforce populations of species from the directives (CS01)
Reduce impact of multi-purpose hydrological changes (CJ02)
Improvement of habitat of species from the directives (CS03)
Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes (CL01)
Adapt/maintain military activities (CH02)

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

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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 map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	1
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	

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Distribution Map

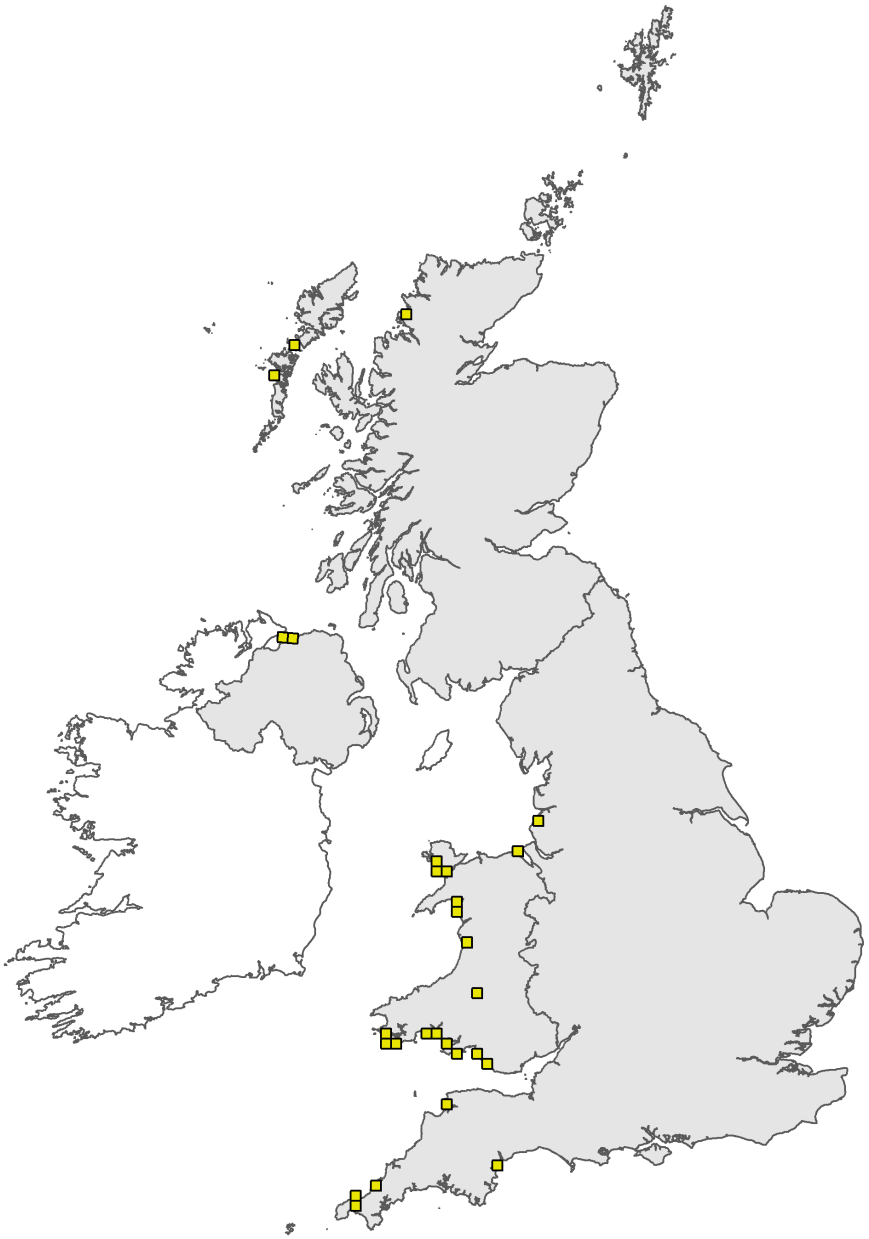

Figure 1: UK distribution map for S1395 - Petalwort (*Petalophyllum ralfsii*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 S1395 - Petalwort (*Petalophyllum ralfsii*). 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: Petalophyllum ralfsii (1395)

Field label	Note
2.3 Distribution map	In NI, the species became extinct from its Portrush localities long ago - it was first recorded here in 1928 and appears not to have been refound. The species is now confined to a single small population in Magilligan SAC (County Londonderry). The species occurs mainly in seasonally damp hollows (slacks') among sand dunes. At Magilligan it grows in old wheel ruts in the slacks, where it is restricted to two areas each a few metres across near a road. The total population is unlikely to exceed a few dozen thalli. The range (single locality at Magilligan) has been stable in recent times (although the actual colony appears to be in decline).

Species name: Petalophyllum ralfsii (1395) Region code: ATL

Field label	Note
7.1 Sufficiency of area and quality of occupied habitat	All sites in Britain are closely associated with sand dunes. It especially favours dune-slacks, with fewer records in dune areas from near pond edges, along damp pathways and in small hollows. It tolerates only light shading. It invariably occurs on calcareous substrates, with a basic reaction. It requires firm or compacted substrates, avoiding really loose or mobile sand, with ideally the water table at or near the surface. Most sites have some bare substratum exposed, commonly 10-50% of bare humic sand amongst low vegetation. All English and Welsh sites are dry for large parts of a normal summer and most are wet or flooded in at least some winters. Although P. ralfsii's habitat requirements have been relatively well documented, habitat area at this fine scale is unknown. There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species. In NI, the dune slack in which it occurs is now almost completely vegetated over - and almost certainly requires remedial works to provide more open sand for the species to thrive. This is a common issue with dune slacks in NI.
8.1 Characterisation of pressures/ threats	The pressures and threats identified as: a. Reduced fecundity / genetic depression (e.g. inbreeding or endogamy) - such tiny population clearly at considerable risk of extinction. b. Mixed source air pollution - the species is very small in stature and cannot compete with taller vegetation - hence anything which acts to increase sward height (i.e. atmospheric Nitrogen) could have a serious impact on the popuation. c. Abandonment of grassland management (e.g. cessation of grazing or of mowing) - as with b. above, the plant requires an open sward. Hence maintaining appropriate grazing levels is essential for its survival. d. Droughts and decreases in precipitation due to climate change - as a wetland species, Petalwort is very sensitive to changes in water balance. Climate change could pose a serious threat to the species if prolonged droughting becomes more frequent. e. Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) - the early succession dune slacks which the species favours are becoming increasingly scarce across UK sand dunes systems generally, and there are none of these successional stages present at Magilligan. f. Military, paramilitary or police exercises and operations on land - the site is an active military range. However, MOD actively promotes nature conservation across its estate and is particularly proactive in implementing conservation measures at Magilligan Training Camp. So this factor is more of an opportunity than a threat or pressure. Nevertheless, with such a tiny population, there is always the risk of a sudden catastrophic event (e.g. wildfire), which could wipe the colony out. g. Modification of hydrological flow - again, the species is very senstive to small changes in hydrology.

9.1 Status of measures	A range of conservation measures have been implemented across the MOD range at Magilligan where the species occurs. These include fencing and a more targetted grazing at the appropriate stocking level. However, these measures have not had a direct impact on the Petalwort colony, and further, more direct, intervention will be required. NIEA is currenly liaising with MOD managers to trial sod removal around the existing colony in an attempt to recreate the bare sand conditions on which the species depends. In addition, more widespread slack rejuvenation techniques will be considered.
10.1 Future prospects of parameters	MOD staff have been very proactive in the conservation management of the Magilligan Training Camp. A range of conservation measures have been implemented. These include fencing and a more targetted grazing at the appropriate stocking level. However, these measures have not had a direct impact on the Petalwort colony, and further, more direct, intervention will be required. NIEA is currenly liaising with MOD managers to trial sod removal around the existing colony in an attempt to recreate the bare sand conditions on which the species depends. In addition, more widespread slack rejuvenation techniques will be considered. For these reasons, we have assessed future prospects as improving, although clearly it remains to be seen whether these measures will prove successful.
11.5 Overall assessment of Conservation Status	Range is Favourable; Population is Unfavourable Bad, on the basis of recent declines in the number of thalli recorded. Habitat for the species is Unfavourable Bad, on the basis that the early successional dune slack communities which the species requires is not present on the site. Future prospects recorded as Unknown - based upon current population and habitat status, and the uncertainty of the proposed conservation measures. Hence overall assessment is Unfavourable Bad.
12.1 Population size inside the pSCIs, SCIs and SACs network	The only site for the species is Magilligan SAC in Co Londonderry, where it occurs in one 1x1km square. The most recent thallus count was one individual.