

**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*)**

**WALES**

## **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 (Wales information only)
1.2 Species code	1395
1.3 Species scientific name	<i>Petalophyllum ralfsii</i>
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

BLOCKEEL, T.L., BOSANQUET, S.D.S., HILL, M.O. & PRESTON, C.D., 2014, Atlas of British and Irish bryophytes. Pisces Publications, Newbury  
 BOSANQUET, S.D.S. 2012a. Supporting information for Countryside Council for Wales submission on *Petalophyllum ralfsii*  
 BOSANQUET, S.D.S. 2012b. Dune bryophytes at Brownslade Burrows, Castlemartin Range SSSI. Unpublished CCW report  
 BOSANQUET, S.D.S. 2015a. Dune mosses and liverworts on Laugharne - Pendine Burrows SSSI revised 2015. Unpublished NRW report  
 BOSANQUET, S.D.S. 2015b. Section 42 bryophytes (*Bryum calophyllum*, *B. warneum* and *Meesia uliginosa*) at Tywyn Aberffraw. Unpublished NRW report  
 CALLAGHAN, D.A. 2014. Bryophyte survey of Newborough Warren - Ynys Llanddwyn. Anglesey. Unpublished report to NRW  
 CALLAGHAN, D.A. 2017a. Bryophyte survey and assessment of Morfa Dyffryn NNR. Unpublished report to NRW  
 CALLAGHAN, D.A. 2017b. Bryophyte survey and assessment of Morfa Harlech NNR. Unpublished report to NRW  
 DUNNE, H., JESSOP, A., STEVENSON, P. & TOWNSEND, N. 2017. *Petalophyllum ralfsii* (Petalwort) Monitoring at Ynyslas NNR, Ceredigion, 2017. Aberystwyth University MSc Thesis  
 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  
 NEWTON, M.E. 2012. GRONANT DUNES AND TALACRE WARREN S.S.S.I.: PETALOPHYLLUM RALFSII RE-MONITORING. Unpublished report to Countryside Council for Wales



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6.8 Short-term trend Direction	Decreasing (-)	
6.9 Short-term trend Magnitude	a) Minimum	0.08
	b) Maximum	0.17
	c) Confidence interval	
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate	
6.11 Long-term trend Period	1995-2018	
6.12 Long-term trend Direction	Decreasing (-)	
6.13 Long-term trend Magnitude	a) Minimum	0.41
	b) Maximum	0.47
	c) Confidence interval	
6.14 Long-term trend Method used	Complete survey or a statistically robust estimate	
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size	14 with unit number of localities (localities)
	b) Operator	
	c) Unknown	
	d) Method	The FRV population was set as 14 localities by Bosanquet (2012a)
6.16 Change and reason for change in population size	Genuine change	
	The change is mainly due to: Genuine change	
6.17 Additional information	The decline in the number of occupied 1x1km squares and the number of localities (from 17 in 1995 to 13 by 2013 and 11 by 2018) tells only part of the story. Monitoring and surveillance have indicated substantial declines in thallus counts and the number of occupied 10x10m squares at almost every Welsh site for <i>Petalophyllum ralfsii</i>	

## 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)?	No
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	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		

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

## 8. Main pressures and threats

### 8.1 Characterisation of pressures/threats

Pressure	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Agricultural activities generating air pollution (A27)	M
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
Industrial and commercial activities and structures generating air pollution (F19)	M
Other invasive alien species (other than species of Union concern) (I02)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Abstraction from groundwater, surface water or mixed water (K01)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Agricultural activities generating air pollution (A27)	H
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Creation or development of sports, tourism and leisure infrastructure (outside the urban or recreational areas) (F05)	M
Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08)	M
Industrial and commercial activities and structures generating air pollution (F19)	M
Other invasive alien species (other than species of Union concern) (I02)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Abstraction from groundwater, surface water or mixed water (K01)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H

### 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? Yes
- b) Indicate the status of measures Measures identified and taken

### 9.2 Main purpose of the measures taken

Increase the population size and/or improve population dynamics (improve reproduction success, reduce mortality, improve age/sex structure) (related to 'Population')

### 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/eliminate soil pollution from agricultural activities (CA14)

Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)

Habitat restoration of areas impacted by residential, commercial, industrial and recreational infrastructure, operations and activities (CF02)

Management, control or eradication of other invasive alien species (CI03)

Reduce impact of mixed source pollution (CJ01)

Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes (CL01)

### 9.6 Additional information

Managing dune systems to increase mobility and increase the abundance of early successional habitats (CL01) has taken place in a number of Natura 2000 sites, as has control of invasive species (CI03); NRW regulate air pollution and limit its impacts on dune systems (CJ01); NRW also regulate agricultural air pollution (CA14), have policies preventing afforestation of dunes (CB01), and are restoring some habitat near a golf course and a caravan park (CF02); military activities (CH02) in one Nature 2000 site have been adapted to benefit Petalwort

## 10. Future prospects

### 10.1 Future prospects of parameters

- a) Range
- b) Population
- c) Habitat of the species

### 10.2 Additional information

Petalwort is declining in Wales: the number of occupied 1km squares and sites has reduced since the last reporting round, the quality of the habitat for the species has deteriorated, and the number of individuals has declined on most sites that have been monitored. The species could be lost from most of its Welsh sites in the near future unless conservation action is successful, despite all Welsh sites being in the Natura 2000 series.

## 11. Conclusions

### 11.1. Range

### 11.2. Population

### 11.3. Habitat for the species



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

## 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 21

### 12.2 Type of estimate

Minimum

### 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

Decreasing (-)

### 12.5 Short-term trend of population size within the network Method used

Complete survey or a statistically robust estimate

### 12.6 Additional information

The entire extant Welsh *Petalophyllum* population is on Natura 2000 sites, but monitoring and surveillance have shown loss from 4 sites in recent years and ongoing declines at all but three sites. Causes of the decline have been identified and some actions have taken place, but larger-scale action (as proposed in SoLIFE) is needed.

## 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

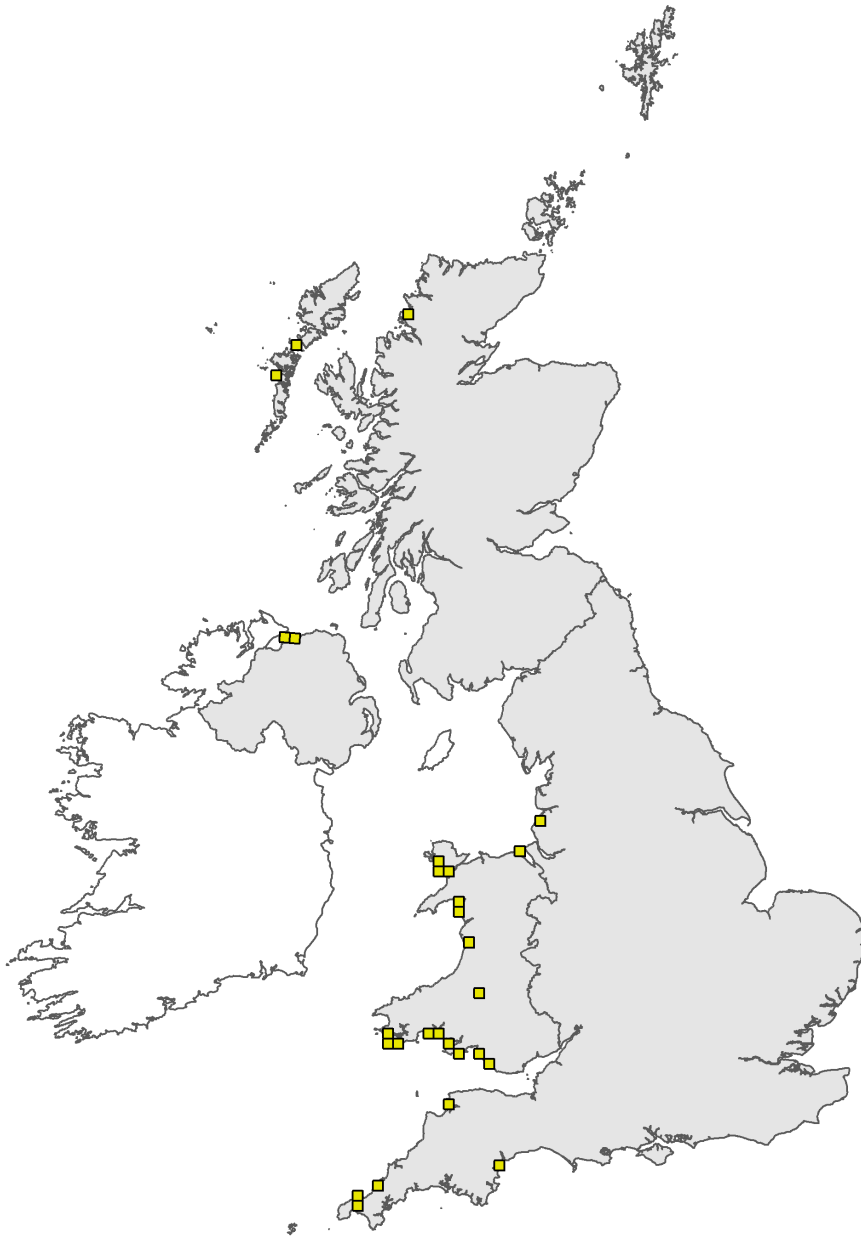


Figure 1: UK distribution map for S1395 - Petalwort (*Petalophyllum ralfsii*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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) Region code: ATL**

Field label	Note
5.3 Short term trend; Direction	Whilst overall range has remained stable, monitoring and surveillance have indicated substantial declines in thallus counts and the number of occupied 10x10m squares at almost every Welsh site for <i>Petalophyllum ralfsii</i> .
5.11 Change and reason for change in surface area of range	Data come from the British Bryological Society, from NRW staff, and from surveyors contracted by NRW; between these sources the entire suite of <i>Petalophyllum</i> sites have been visited during the reporting period.
6.6 Population size; Method used	The population size was derived by counting occupied 1x1km squares using the British Bryological Society dataset supplemented by records made by NRW staff and contractors. Bosanquet (2012a) used localities as the population unit last round.
6.8 Short term trend; Direction	The decline is simply a product of the comparison to 2013 (i.e. 12 localities six years ago) when short-term trend is over a longer period (2007-2018).
6.9 Short term trend; Magnitude	a) Min 8.7 % decline (from 23 occupied 1x1km grid squares in 2007-2012 to 21 occupied 1x1km grid squares in 2013-2018) b) Max 17.4% decline (from 23 to 19 occupied 1x1km grid squares, because two further populations are believed to have been lost, at Kenfig Burrows and Morfa Harlech, since 2013 and 2015 respectively)
6.13 Long term trend; Magnitude	a) Min 41.7% (from 36 occupied 1x1km grid squares since 1995 to 21 occupied 1x1km grid squares in 2013-2018) b) Max 47.2% (from 36 occupied 1x1km grid squares since 1995 to 19 occupied 1x1km grid squares in 2013-2018, including loss from two sites mentioned in 6.9)
6.17 Additional information	With regard to 6.18 - Most populations hold male and female plants and some sporophytes if surveyed at a suitable time of year
7.1 Sufficiency of area and quality of occupied habitat	Bosanquet (2012a) reported the area occupied by Petalwort as 22 ha in the last reporting round. The area of potentially suitable habitat has increased quite significantly, following dune destabilisation work at Kenfig, Merthyr Mawr and Newborough, as well as smaller-scale scraping at Aberffraw, Broomhill Burrows, Brownslade Burrows, Talacre Warren and Tywyn Burrows. However, colonisation of new scrapes has only taken place at Broomhill Burrows, as well as brief appearances (a few thalli for one season, with subsequent loss) in two scrapes at Kenfig, which suggests that the quality remains insufficient for the species. Much of the occupied habitat is becoming more closed, with increasing vascular plant growth and reducing abundance of Petalwort. At some sites, such as Merthyr Mawr (Wilkinson, 2018) and Talacre Warren (Newton, 2011), Petalwort is restricted to trampled paths through rank slacks.

## 8.1 Characterisation of pressures/ threats

Pressures: the principal pressures are under-grazing (A10) and resulting natural succession (L02), exacerbated by air pollution (A27 & J03). The invasive shrub (I02) Hippophae is a significant problem on a number of sites, and Talacre Warren holds a suite of other problem INNS. Forestry activities (B01 & B27) are pressures at Newborough Warren and Tywyn Burrows. Sand Dredging (C01) has been blamed for decreased dune mobility at a number of sites. The extent of golf courses, sea defences etc. (F05 & F08) currently has limited impacts on Petalwort, whilst military activities (H01) are carefully controlled to avoid damage at one site. Abstraction from the groundwater (K01) has been suggested as a cause of lowered water levels at Kenfig. Threats: all current pressures are expected to continue to act over the next two reporting cycles. Agricultural pollution (A27) seems to be an increasing threat, especially if intensive agriculture is permitted close to dune systems. Afforestation (B01) may increase in the future, as may coastal development (F05 & F08) - depending on GB/Welsh legislation and protection.

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## 9.5 List of main conservation measures

Managing dune systems to increase mobility and increase the abundance of early successional habitats (CLO1) has taken place in a number of Natura 2000 sites, as has control of invasive species (CI03); NRW regulate air pollution and limit its impacts on dune systems (CJ01); NRW also regulate agricultural air pollution (CA14), have policies preventing afforestation of dunes (CB01), and are restoring some habitat near a golf course and a caravan park (CF02); military activities (CH02) in one Nature 2000 site have been adapted to benefit Petalwort.

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