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 habitat:

H7220 - Petrifying springs with tufa formation (*Cratoneurion*)

ENGLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, 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 habitat 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; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions 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 17 for Annex I habitat types (Annex D)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (England information only)**
1.2 Habitat code	**7220 - Petrifying springs with tufa formation (Cratoneurion)**

2. Maps

2.1 Year or period	2018-
2.3 Distribution map	Yes
2.3 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Atlantic (ATL)**
3.2 Sources of information	Farr, G & GRAham, J. 2017. Survey, characterisation and condition assessment of Palustriella dominated springs 'H7220 Petrifying springs with tufa formation (Cratoneurion)' in Gloucestershire, England. British Geological Survey, OR/17/020. 145pp. Farr, G & Graham, J. 2017. Devevlopment of inventory for H7220 Petrifying Springs with Tufa formation. Unpublished report to Natural England. Pilkington, S. 2014. Springs and Seepages of Wessex: Mendips Bryophyte Survey. Report to Buglife & Wessex Water. Diack, I.A. (2015) Natural England SSSI Notification Strategy: SSSI Notification Review and Guidance for Fens. Unpublished Report. Natural England (2015) Hydrological functioning theme plan. Restoring the hydrology of Natura 2000 terrestrial wetlands. Tratt, R., Parnell, M., Eades, P. and Shaw, S.C. (2013). Development of Inventories for Annex 1 habitats 'Alkaline Fens' and 'Transition Mires & Quaking Bogs' in England. Report to Natural England, Telford.

4. Range

4.1 Surface area (in km²)		
4.2 Short-term trend Period		
4.3 Short-term trend Direction	Stable (0)	
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum
4.5 Short-term trend Method used		
4.6 Long-term trend Period		
4.7 Long-term trend Direction		
4.8 Long-term trend Magnitude	a) Minimum	b) Maximum
4.9 Long-term trend Method used		
4.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown No d) Method	
4.11 Change and reason for change in surface area of range	Improved knowledge/more accurate data The change is mainly due to: Improved knowledge/more accurate data	

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4.12 Additional information

5. Area covered by habitat

5.1 Year or period	2018-018-		
5.2 Surface area (in km²)	a) Minimum 0.65	b) Maximum 2	c) Best single value 1.3
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Based mainly on expert opinion with very limited data		
5.5 Short-term trend Period	2007-2018		
5.6 Short-term trend Direction	Decreasing (-)		
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data		
5.9 Long-term trend Period			
5.10 Long-term trend Direction			
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used			
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown No d) Method		
5.14 Change and reason for change in surface area of range	Improved knowledge/more accurate data The change is mainly due to: Improved knowledge/more accurate data		
5.15 Additional information			

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum 0.06	Maximum 0.3
	b) Area in not-good condition (km²)	Minimum 0.35	Maximum 0.59
	c) Area where condition is not known (km²)	Minimum 0.24	Maximum 1.11
6.2 Condition of habitat Method used	Based mainly on expert opinion with very limited data		
6.3 Short-term trend of habitat area in good condition Period	2007-2018		
6.4 Short-term trend of habitat area in good condition Direction	Decreasing (-)		
6.5 Short-term trend of habitat area in good condition Method used	Based mainly on extrapolation from a limited amount of data		
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period? No		
6.7 Typical species Method used			
6.8 Additional information			

7. Main pressures and threats

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7.1 Characterisation of pressures/threats

Pressure	Ranking
Drainage (K02)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Abstraction from groundwater, surface water or mixed water (K01)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Intensive grazing or overgrazing by livestock (A09)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	H
Other modification of hydrological conditions for residential or recreational development (F31)	M

Threat	Ranking
Drainage (K02)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Abstraction from groundwater, surface water or mixed water (K01)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Intensive grazing or overgrazing by livestock (A09)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	H
Other modification of hydrological conditions for residential or recreational development (F31)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified, but none yet taken
8.2 Main purpose of the measures taken		Restore the habitat of the species (related to 'Habitat for the species')
8.3 Location of the measures taken		Only outside Natura 2000
8.4 Response to the measures		Medium-term results (within the next two reporting periods, 2019-2030)

8.5 List of main conservation measures

Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)
Reduce/eliminate air pollution from agricultural activities (CA12)
Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)

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Manage water abstraction for public supply and for industrial and commercial use (CF11)

Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land (CA01)

8.6 Additional information

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

10. Conclusions

10.1. Range	
10.2. Area	
10.3. Specific structure and functions (incl. typical species)	
10.4. Future prospects	
10.5 Overall assessment of Conservation Status	
10.6 Overall trend in Conservation Status	
10.7 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:
10.8 Additional information	

11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum 0.65 b) Maximum 1 c) Best single value 0.825
11.2 Type of estimate	Best estimate
11.3 Surface area of the habitat type inside the network Method used	Based mainly on expert opinion with very limited data
11.4 Short-term trend of habitat area in good condition within the network Direction	Stable (0)
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on extrapolation from a limited amount of data
11.6 Additional information	

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12. Complementary information

12.1 Justification of % thresholds for trends

12.2 Other relevant information

Distribution Map

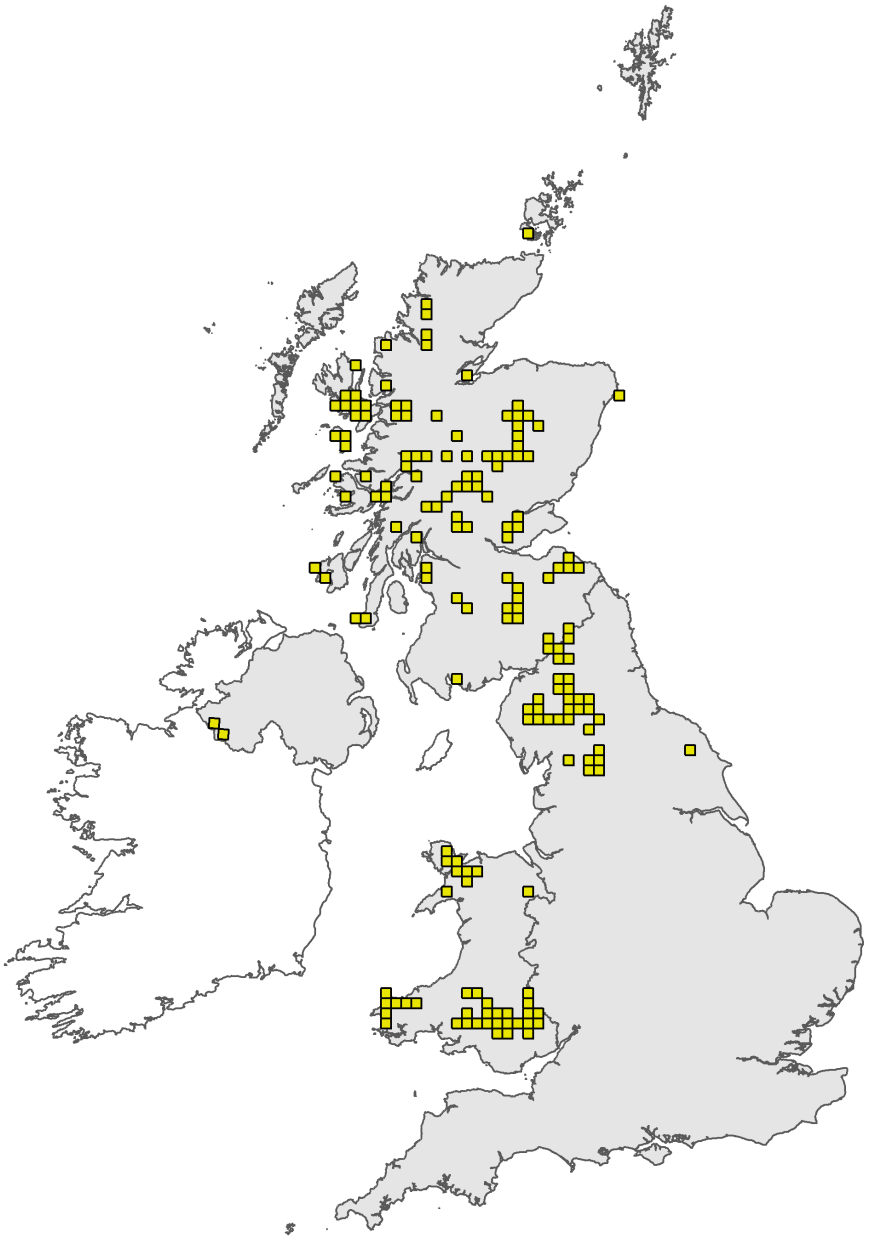

Figure 1: UK distribution map for H7220 - Petrifying springs with tufa formation (*Cratoneurion*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

Range Map

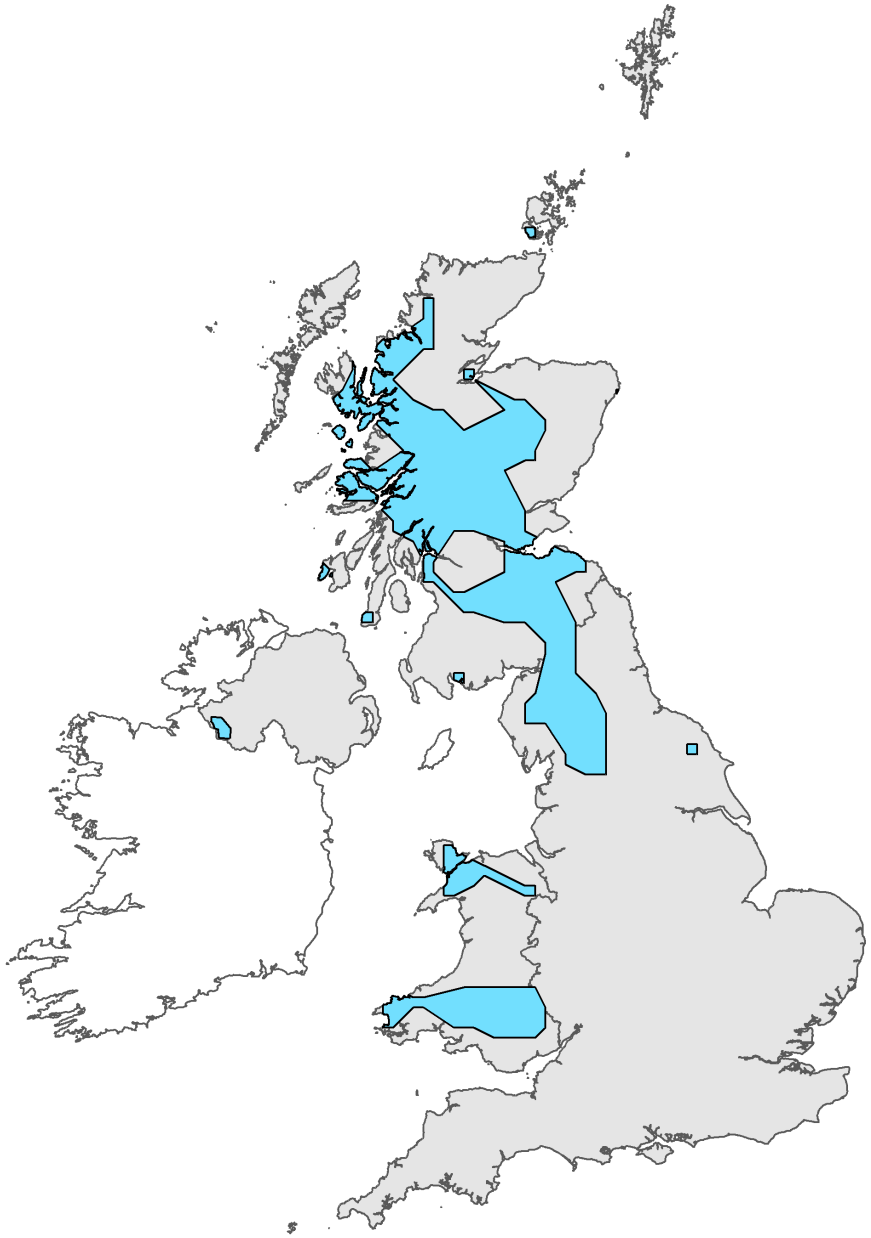

Figure 2: UK range map for H7220 - Petrifying springs with tufa formation (*Cratoneurion*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 habitat was 25km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Habitat code: 7220

Field label	Note
2.2 Distribution map	Map developed through inventory project informed by exisitng data and some new survey. New survey is not comprehensive - more work needed. The result however supports the 2013 H7220 report which identified the feature occurring much more widely than previoulsy acknowledged, with particular range extensions into the south and lowland areas. Survey work in the Cotswolds and Mendips has shown an abundance of sites in these areas, for example.

Habitat code: 7220 Region code: ATL

Field label	Note
4.11 Change and reason for change in surface area of range	While surface area is not known (!) the identification of many sites in areas previoulsy though to be outside the range has clearly increased the known surface area of the range.
5.2 Surface area	These figures are based on a) the area on JNCC SAC list, plus b) a crude estimate of likely area outside this based on known occurrence in SSSI and non-SSSI sites, e.g. those identified in recent surveys. As noted in 2013 the habitat is difficult to survey/identify and it's even more difficult to quantify extent, given generally very small size of habitat patches and/or linear nature of habitat. Detailed mapping is therefore time consuming and potentially misleading as small mapping errors may, for example double/halve extent. A more satisfactory metric might be number of occupied 10km squares plus count of habitat features per square. As further survey is done this approach can be developed.
5.6 Short term trend; Direction	Decreasing based on expert knowledge of examples of loss (I.Diack) and survey reports, e.g. Mendips survey.
6.1 Condition of habitat	Based on limited informationon SAC sites (figures given are proportion of 65 ha - JNCC area in SAC - based on condition of hosting SSSI unit). SAC figure for good condition may be underestimate as many tufa springs in otherwise unfavourable large upland units are actually in good condition, but may not be monitored separately. Otherwise little information is available on habitat condition as it is largely not monitored - or indeed even recorded as present - outside of SAC (on SSSI or non-SSSI), except where specific survey has been commissioned, e.g. Cotswolds, Mendips.
6.4 Short term trend of habitat area in good condition; Direction	Based on known losses and examples of habitat deterioration.
9.1 Future prospects of parameters	Stable range based on increased knowledge of habitat and its importance, e.g. now being picked up in forestry EIA, although risk of afforestation in poorly surveyed areas such as Northumberland is still a risk. Negative area and S&F due to known ongoing loss and degradation and high N atmospheric deposition in areas supporting H7220, although not picked up in JNCC spreadsheet. Given importance of bryophytes in integrity of habitat, this must be a threat.
11.3 Surface area of the habitat type inside the network; Method used	JNCC data for minimum; best estimate (very rough!) for maximum.