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:

S1654 - Early gentian (*Gentianella anglica*)

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.

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NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Wales information only)**
1.2 Species code	**1654**
1.3 Species scientific name	**Gentianella anglica**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Early gentian

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2015-
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

Centre for Ecology and Hydrology 2018. Air Pollution Information System. Site Relevant Critical Loads. Stackpole SSSI. Available from: http://www.apis.ac.uk/ [Accessed 5th July 2018]
Natural Resources Wales 2013. 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: S1654 - Early gentian (Gentianella anglica). Available from: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1654_WALES.pdf [Accessed 5th July 2018]
Rees, I. & Rich, T.C.G. (2012) Spring flowering by Gentianella amarella s.l. in Anglesey (v.c.52) pp.43-4. BSBI News (121)
Rich, T.C.G., Holyoak, D.T., Margetts, L.J. & Murphy, R.J. (1997) Hybridisation between Gentianella amarella (L.) Boerner and G. anglica (Pugsley) E. F. Warb. (Gentianaceae) Watsonia Vol. 21 p.p. 313-325
Sell, P.D. & Murrell J.G. (2009) Flora of Great Britain and Ireland, Volume 3: Mimosaceae - Lentibulariaceae. CUP Cambridge.
Stace, C.A. (2010) New Flora of the British Isles.`3rd ed. CUP Cambridge.
Sutton, M. (2012). Survey of Stackpole NNR grasslands, heaths, dunes and coast. Matt Sutton Ecology. CCW Internal Report.
Wilkinson, K. (2004) Limestone Coast of South West Wales SAC Monitoring. Gentianella anglica (1654) Monitoring Round 1 (2000 -2006). Countryside Council for Wales internal report.
Wilkinson, K. (2009) Limestone Coast of South West Wales SAC Monitoring. Gentianella anglica (1654) Monitoring Round 2 (2007-2012). Countryside Council for Wales internal report.

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Wilkinson, K. (2015) Limestone Coast of South West Wales SAC Monitoring. Gentianella anglica (1654) Monitoring Round 2 (2012-2018). Natural Resources Wales internal draft report.
Wilson, P. J. (1999) The distribution and status of Gentianella anglica (Pugsley) E. Warb. English Nature Species Recovery Programme/ Plantlife (Back from the Brink Project) Report No. 119
Winfield M.O, Wilson P.J, Labra. M, Parker J.S. (2002) A brief evolutionary excursion comes to an end: the genetic relationship of British species of Gentianella sect. Gentianella (Gentianaceae). Plant systematics and Evolution 237, pp. 137 -151.

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
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	2015	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	
	c) Maximum	
	d) Best single value	40
6.3 Type of estimate	Best estimate	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	number of localities (localities)
	b) Minimum	
	c) Maximum	
	d) Best single value	1

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6.5 Type of estimate	Best estimate
6.6 Population size Method used	Complete survey or a statistically robust estimate
6.7 Short-term trend Period	2003-2015
6.8 Short-term trend Direction	Uncertain (u)
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	
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	No change The change is mainly due to:
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)?	Unknown
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	2004-2015	
7.4 Short-term trend Direction	Uncertain (u)	
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		

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8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Extensive grazing or undergrazing by livestock (A10)	M
Other invasive alien species (other then species of Union concern) (I02)	M
Mixed source air pollution, air-borne pollutants (J03)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	M
Other invasive alien species (other then species of Union concern) (I02)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	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

Maintain the current range, population and/or 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

Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Other measures related to problematic species (CI06)
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

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10. Future prospects

10.1 Future prospects of parameters	a) Range b) Population c) Habitat of the species
10.2 Additional information	

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 localities (localities)
	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	Uncertain (u)	
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

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13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

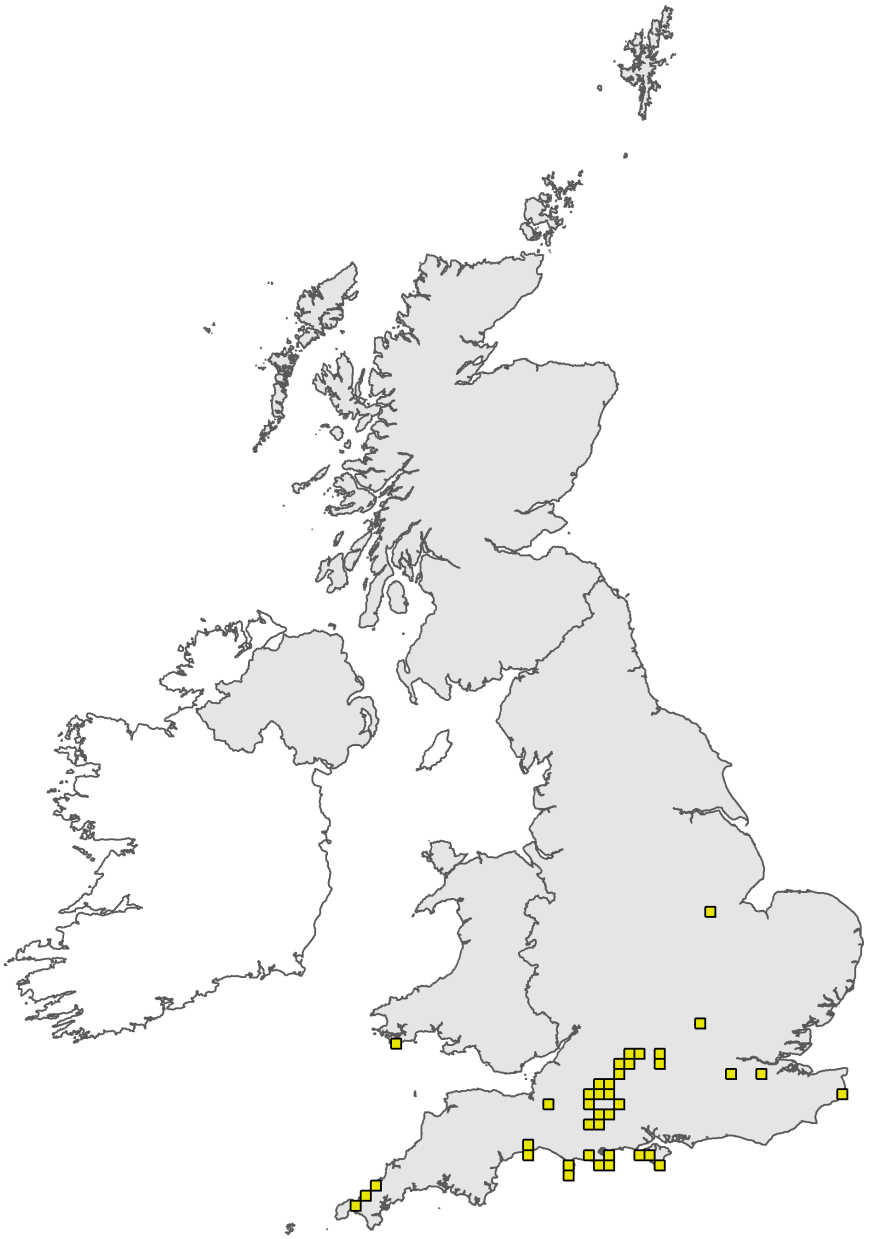

Figure 1: UK distribution map for S1654 - Early gentian (*Gentianella anglica*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

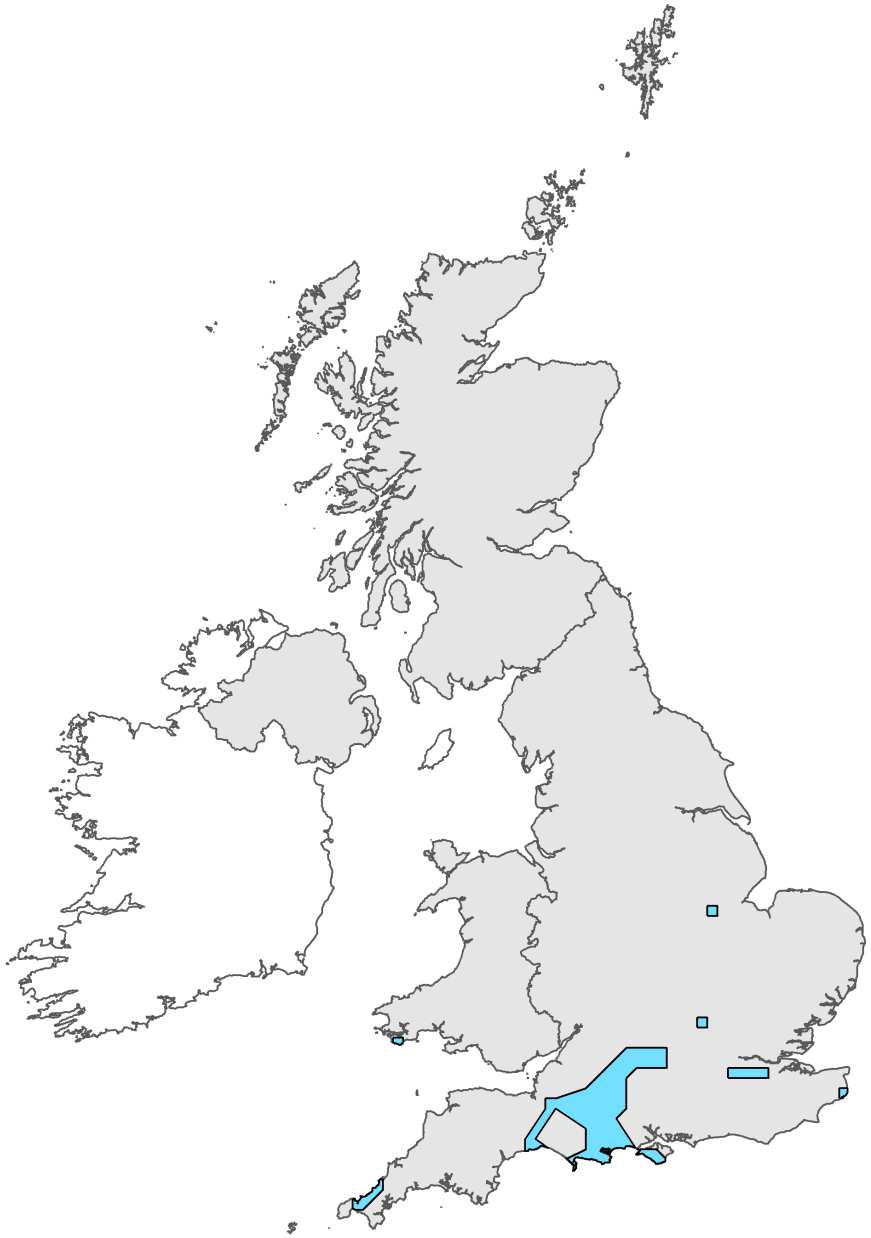

Figure 2: UK range map for S1654 - Early gentian (*Gentianella anglica*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: Gentianella anglica (1654)

Field label	Note
2.4 Distribution map; Method used	There are recent records for Gentianella anglica sensu lato from just one 10 km sq. in Wales and this population (at Stackpole National Nature Reserve) is still extant. The leading taxonomic specialist in this field has found candidate material from other welsh sites to be indeterminate (Rees & Rich, 2012) and, more generally, there is disagreement between published Floras over the validity of this taxon (Stace, 2010; Sell & Murrell, 2009), although with the more conservative position (accepting G. anglica) strongly considering a lower taxonomic rank.

Species name: Gentianella anglica (1654) Region code: ATL

Field label	Note
5.11 Change and reason for change in surface area of range	There has been no change to the recorded 10km square distribution of 'Gentianella anglica' in Wales, where it is confined to a single site.
6.2 Population size	The number of individual plants within the population is difficult to estimate due to its close intermixing and probable hybridisation with the closely related Gentianella amarella here. Population estimates are further complicated by the wide inter-annual fluctuations in abundance of this annual species.
6.4 Additional population size	Gentianella anglica is known from a single locality in Wales, Stackpole Warren, where it occupies dry slacks within a perched dune system.
6.6 Population size; Method used	The Gentianella anglica population at Stackpole Warren is monitored approximately once every six years as part of NRWs SAC monitoring programme. Monitoring focuses on the condition of the plant's habitat and the local distribution of individuals conforming to the morphological description of G. anglica.
6.8 Short term trend; Direction	While there has been no change in the number of localities from which G. anglica is recorded in Wales, the trend in numbers of individual plants remains uncertain because verifiable counts of 'G. anglica' are difficult if not impossible, as taxonomic identification of material in the field is imprecise and many individuals cannot be assigned to 'G. anglica' (or other supposedly related taxa) with any degree of confidence. Counts of candidate 'G. anglica' can vary throughout the growth season as material approximating to this taxon either grows into or is replaced by other variants. There also appears to be significant differences between observers, due to differences in sampling and measurement technique and / or the overlapping range of taxonomic characters.
6.10 Short term trend; Method used	The population of G. anglica at Stackpole Warren NNR is the focus of regular (six yearly) and comprehensive monitoring, focussing on the frequency and distribution of plants conforming to the morphological description of G. anglica and the condition of its supporting habitat. Despite this detailed monitoring, the difficulties associated with confidently assigning a individual plants to the taxon, along with the unknown scale of natural inter-annual fluctions in population size mean that a trend in population numbers cannot be identified.
6.17 Additional information	There is no reason to suspect that the reproduction, mortality or age structure of the Gentianella anglica population in Wales is deviating from the normal.

7.1 Sufficiency of area and quality of occupied habitat	SAC monitoring of Gentianella anglica at Stackpole Warren in 2015 (Wilkinson, 2015), revealed that the habitat was in unfavourable condition for the species largely as a consequence of the encroachment of bracken, Rubus caesius and other more rubust/competitive species within the short, open-turved, dry slack habitat that the Gentian requires at this site. It is unknown whether or not the area of currently occupied habitat at Stackpole is sufficient to maintain a population in the longer term. The species is only known from a small and environmentally homogeneous area (0.21 ha) of dry slack habitat (Sutton, 2012) within the wider perched dune system which effectively limits the size of the population making it more vulnerable to stochastic effects and chance events. The extent of suitable but unoccupied habitat in Wales is unknown, but likely to be very limited. The steep, mostly south-facing chalk downland slopes the species is associated within its core range in southern England are absent from Wales and dry slack habitat of the kind that G. anglica currently occupies at Stackpole is extremely restricted, with few if any sites other Welsh sites providing similar conditions.
7.2 Sufficiency of area and quality of occupied habitat; Method used	The habitat for the species at Stackpole Warren (part of the Limestone Coast of South West Wales SAC) has been systematically recorded as part of NRWs SAC monitoring programme (Wilkinson, 2015).
7.4 Short term trend; Direction	Common Standards monitoring of the habitat for Gentianella anglica at Stackpole Warren (Wilkinson, 2004, 2009, 2015) shows no clear trend in habitat extent or condition. There is some evidence of localised encroachment by bracken and Rubus caesius and decreases in the extent of bare ground within the monitoring plots perhaps suggesting a minor reduction in habitat quality, but these changes are too small to be confident that they represent a genuine and ecologically significant change in habitat condition.
7.5 Short term trend; Method used	Both the species and its habitat are the focus of regular systematic monitoring at its only site in Wales.
8.1 Characterisation of pressures/ threats	Pressures: The habitat for Gentianella anglica is reliant on suitable levels of grazing to maintain the open structure on which the species depends. Under-grazing (A10) in combination with other drivers such as excess deposition of atmospheric nitrogen may be contributing to the encroachment of Rubus caesius and other coarse species into the core habitat for the species at its one Welsh site. In Wales G. anglica occupies open areas of dry slack habitat within a fossilised perched dune system. These areas are threatened by habitat succession (L02) which is likely to be exacerbated by excess N deposition (J03) and under-grazing (A10). The current estimated deposition rate for atmospheric nutrient nitrogen at Stackpole is 13 Kg N/ha/yr (based on the estimated average deposition for the years 2014-16) (Air Pollution Information System, 2018). This rate exceeds the Critical Load mapping value for grey dunes (H2130) and approaches that for calcareous grasslands (H6210) which represent the two closest Annex I habitat types to the vegetation in which G. anglica occurs. Excess nutrient nitrogen in these habitats is likely to accelerate natural successional processes and encourage the spread of nitrophilous species at the expense of G. anglica and other small herbs. Rabbits are important grazers at Stackpole and play a key role in maintaining the open and short-grazed turf occupied by the gentian. Populations have in the past been adversely impacted by both myxomatosis and rabbit haemorrhagic disease. This pressure is currently assigned to I02, but would fall under the new I05 category which covers plant and animal pathogens and pests. Plants of Gentianella conforming to the published description of G. anglica at Stackpole are closely associated with larger numbers of plants clearly assignable G. amarella, alongside individuals with intermediate morphology and an overlapping flowering period. The presence of these intermediate plants suggests a degree of hybridisation between the two 'species' at this site and indicates an ongoing risk to those plants with the strongest morphological similarity to G. anglica (L06). Threats: All the listed pressures are considered current and likely to continue to have an impact over the next twelve years.

9.1 Status of measures	Management of the grazing unit at Stackpole NNR is the main factor in maintaining and restoring habitat for this species. However, hybridisation with the related Gentianella amarella, excess deposition of atmospheric nitrogen, ongoing successional processes within a largely fossilised perched dunes system and the threat to the rabbit population posed by rabbit haemorrhagic disease and other pathogens present challenges to which there are at present no clear solutions.
9.5 List of main conservation measures	CA05 & CL01 - Continued management of the grazing unit at Stackpole NNR is the main factor in maintaining the habitat for this species. Focussed management of the bracken and coarse vegetation within the dune hollows where the Gentian occurs should be a priority, with management in other adjacent hollows a secondary priority. Management should be through grazing and cutting / mowing (Wilkinson 2015) CI06 Measures to reduce the threat of Myxomatosis and Rabbit Haemorrhagic Disease to the local rabbit population (which is important in maintaining the habitat for 'G. anglica') have not yet been undertaken. However, steps such as vaccination and bolstering of the population are to be trialled at other sites as part of a recently approved LIFE project on Welsh dunes and could potentially be extended to Stackpole if successful. CJ01 National regulations and local controls are in place controlling emissions of reactive nitrogen and other atmospheric pollutants from various sectors and sources.
10.1 Future prospects of parameters	The range and 10km square distribution of 'Gentianella anglica' in Wales is considered unlikely to change in the short to medium-term. Hybridisation and habitat change are considered to represent significant threats to the population of 'G. anglica' at its one Welsh site. These threats are only partially addressed by either existing or proposed conservation measures and are considered likely to result in a decline in the population of plants meeting the description of G. anglica. Habitat succession exacerbated by excess deposition of atmospheric nitrogen represents a significant threat to the extent and condition of the habitat for 'G. anglica' at Stackpole. Although ongoing active management of the NNR (notably through manipulation of grazing timing and intensity, and bracken control) should to some extent mitigate these impacts they are considered unlikely to completely negate them.
12.1 Population size inside the pSCIs, SCIs and SACs network	The only known population of Gentianella anglica in Wales falls within the Limestone Coast of South West Wales SAC.
12.3 Population size inside the network; Method used	The population of Gentianella anglica at Stackpole is subject to regular monitoring as part of NRWs SAC monitoring programme.
12.4 Short term trend of the population size within the network; Direction	While there has been no change in the number of welsh SAC from which G. anglica is recorded in Wales, the trend in numbers of individual plants remains uncertain. Verifiable counts of 'G. anglica' are difficult if not impossible, as taxonomic identification of material in the field is imprecise and many individuals cannot be assigned to 'G. anglica' with any degree of confidence. Counts of candidate 'G. anglica' can vary throughout the growth season as material approximating to this taxon either grows into or is replaced by other variants. There also appears to be significant differences between observers, due to differences in sampling and measurement technique and / or the overlapping range of taxonomic characters (NRW, 2013).
12.5 Short term trend of population size within the network; Method used	The population of G. anglica at Stackpole Warren NNR is the focus of regular and comprehensive monitoring, focussing on the frequency and distribution of plants conforming to the morphological description of G. anglica and the condition of its supporting habitat. Despite this detailed monitoring, the difficulties associated with confidently assigning a individual plants to the taxon, along with the unknown scale of natural inter-annual fluctions in population size mean that a trend in population numbers cannot be identified.