

Report under The Conservation of Habitats and
Species Regulations 2017 (as amended),
Regulation 9A

2019-2024

Conservation status assessment for the species:

S1654 - Early gentian

(Gentianella anglica)

England



For further information please contact:

Natural England, Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX.
<https://www.gov.uk/government/organisations/natural-england>

JNCC, Quay House, 2 East Station Road, Fletton Quays, Peterborough, PE2 8YY.
<https://jncc.gov.uk>

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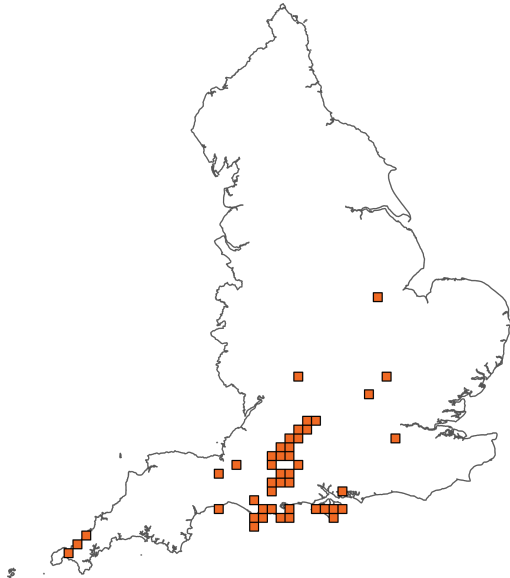
Important note - Please read

- The information in this document represents the England Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A, for the period 2019-2024.
- It is based on supporting information provided by Natural England, which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the species are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country 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 National Site Network coverage for Annex II species).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the [JNCC website](#).

Assessment Summary: Early gentian

Distribution Map



Range Map

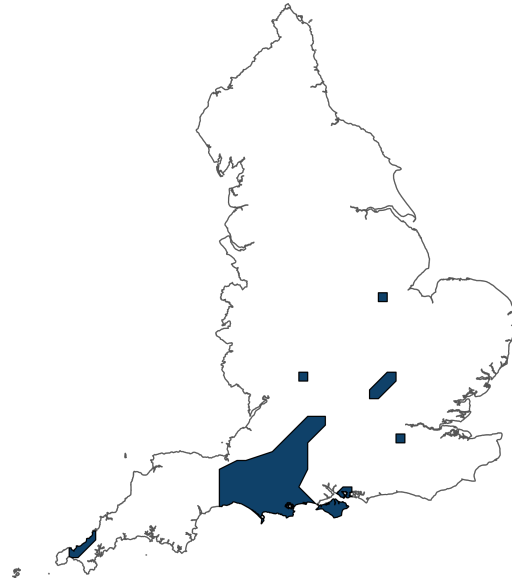


Figure 1: England distribution and range map for S1654 - Early gentian (*Gentianella anglica*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available species records within the current reporting period.

Table 1: Table summarising the conservation status for S1654 - Early gentian (*Gentianella anglica*). Overall conservation status for species is based on assessments of range, population, habitat for the species, and future prospects.

Overall Conservation Status (see section 11)

Unfavourable-bad (U2)

Breakdown of Overall Conservation Status

Range (see section 5)

Unfavourable-inadequate (U1)

Population (see section 6)

Unfavourable-bad (U2)

Habitat for the species (see section 7)

Unfavourable-inadequate (U1)

Future prospects (see section 10)

Unfavourable-bad (U2)

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National Level

1. General information

1.1 Country	England
1.2 Species code	S1654
1.3 Species scientific name	<i>Gentianella anglica</i>
1.4 Alternative species scientific name	Gentianella amarella subsp. anglica
1.5 Common name	Early gentian
Annex(es)	II, IV

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2010-2024
2.3 Distribution map	Yes
2.4 Distribution map; Method used	Complete survey or a statistically robust estimate

2.5 Additional information

Occupied hectads between 2010-2024 mapped, using data from BSBI Distribution Database (BSBI, DDb, accessed January 2025).

3. Information related to Annex V Species

3.1 Is the species taken in the wild / exploited?

3.2 What measures have been taken?

a) Regulations regarding access to property

b) Temporary or local prohibition on the taking of specimens in the wild and exploitation

c) Regulation of the periods and/or methods of taking specimens

d) Application of hunting and fishing rules which take account of the conservation of such populations

e) Establishment of a system of licences for taking specimens or of quotas

f) Regulation of the purchase, sale, offering for sale, keeping for sale, or transport for sale of specimens

g) Breeding in captivity of animal species as well as artificial propagation of plant species

Other measures

Other measures description

3.3: Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit

Table 2: Quantity taken from the wild during the reporting period (see 3.3a for units). For species with defined hunting seasons, Season 1 refers to 2018/2019 (autumn 2018 to spring 2019), and Season 6 to 2023/2024. For species without hunting seasons, data are reported by calendar year: Year 1 is 2019, and Year 6 is 2024.

	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
b) Minimum	-	-	-	-	-	-
c) Maximum	-	-	-	-	-	-
d) Unknown	-	-	-	-	-	-

3.4: Hunting bag or quantity taken in the wild; Method used

3.5: Additional information

No additional information

Biogeographical Level

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs ATL

4.2 Sources of information

See section 14 References

5. Range

5.1 Surface area (km²) 8,644.6

5.2 Short-term trend; Period 2013-2024

5.3 Short-term trend; Direction Decreasing

5.4 Short-term trend;
Magnitude

a) Estimated minimum

b) Estimated maximum

c) Pre-defined range

d) Unknown

e) Type of estimate Best estimate

f) Rate of decrease Decreasing >1% (more than one percent) per year on average

5.5 Short-term trend; Method used Based mainly on extrapolation from a limited amount of data

5.6 Long-term trend; Period 2000-2024

5.7 Long-term trend; Direction Decreasing

5.8 Long-term trend;
Magnitude

a) Minimum

b) Maximum

c) Rate of decrease

	Decreasing >1% (more than one percent) per year on average
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5.9 Long-term trend; Method used	Based mainly on extrapolation from a limited amount of data
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5.10 Favourable Reference Range (FRR)

a) Area (km ²)	12,407
b) Pre-defined increment	
c) Unknown	No
d) Method used	Expert opinion
e) Quality of information	moderate

5.11 Change and reason for change in surface area of range

a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	Yes
d) Different method	
e) No information	
f) Other reason	
g) Main reason	Genuine change

5.12 Additional information

The current range is 8644.6km² in England (for time period 2010-2024), whereas in 2019 it was 6911.61km² (time period 2013-2018). The latter was regarded at the time as inaccurate due to insufficiency of the data (JNCC 2019b) and the range was judged by expert opinion in 2019 to be closer to the figure in the 2013 report (14,673.47km²), rather than the much lower figure (by 53%) 6911.61km² in 2019, which was therefore considered a non genuine decrease. The time period selected for distribution and range in this report was deliberately chosen to provide the most accurate picture possible for current range to provide a meaningful baseline. Despite the differences in time periods and vagaries in the availability of data it is still possible to detect trends, with certain caveats. The FRR was set in 2007 and retained in 2013 as 12,407km² for England

(measured for the time period 1987-1999), but in 2019 this was changed to an operator 'Approximately equal to (\approx)' the range when the Habitats Directive came into force. In 2019 expert opinion judged that the species still occupied a range above the FRR as it was likely similar to the 2013 range figure and that therefore that the long term range trend was stable. The decline in the species was attributed to the number and quality of the sites rather than in overall range and despite loss of some outliers there was no particular reason to believe that the range in 2019 was insufficient to support the species (JNCC, 2019). Review of the data in 2024 now suggests that extrapolating the range in 2019 from 6911.61km² to 14,673.47km² was an overly optimistic interpretation. The following observations can now be made that indicate this was almost certainly an overestimate: the species occupied 39 hectads in England in the 2018 reporting round (date range 2013-2018 - the following sources: BSBI data, personal communications from Vice Recorder for Cornwall and a sample survey conducted by Species Recovery Trust, 2017). For this reporting round the species occupies 49 hectads for the date range 2010-2024, a range selected to account for a drop in recording effort post completion of the Plant Atlas 2020. Perhaps there is over compensation occurring here, as there is an apparent increase since 2018, but is likely mainly due to the extension of the date range. If the analysis is restricted to change between the two reporting rounds in 2018 and 2024 - the distribution in 2018 (38 hectads) has declined to 32 hectads in the period since the last report (2019-2024). Assessing this data, it is considered likely that an actual decline in this species has occurred between reporting rounds, notwithstanding possible exacerbation by reduced recording effort post Atlas 2020. This aligns more with long term observed trends by other analyses. The current threat status review regards the species as having declined by about 25% between the 2nd and 3rd plant atlases (1987-2019) based on hectad counts (Stroh, pers.comm. 2024) with ongoing threats to many populations, meaning the species qualifies as Vulnerable (VU). The standard long term date period for range in this report is 2000-2024 and viewing the evidence in Plant Atlas 2020 over this time frame there has been a clear decline in hectad occupation, especially outside the core area on the chalk downlands of Hampshire, the Isle of Wight and Wiltshire, presumably due to spread of scrub and tall grasses where grazing levels have been reduced and possibly hybridization with subsp. *amarella* in some populations (Stroh et al, 2023). In conclusion if the current range (8644.6km²) is taken as largely representative, and we apply a more conservative approach to the expert opinion of 2019 that the range figure then (6911.61km²) was underestimated by 53%, but use a smaller and more realistic amount, say 30% underestimate (giving a figure of 11,313.651km²), then the range has genuinely contracted. This holds true even if we have also underestimated the current range by as much 30% when the current range would be estimated as 11237.98km², which is unlikely there being more confidence in the data for this reporting round than previously.

6. Population

6.1 Year or period 2019-2024

6.2 Population size (in reporting unit)

a) Unit number of localities

b) Minimum

c) Maximum

d) Best single value 38

6.3 Type of estimate Best estimate

6.4 Quality of extrapolation to reporting unit moderate

6.5 Additional population size (using population unit other than reporting unit)

a) Unit number of map 1x1 km grid cells

b) Minimum

c) Maximum

d) Best single value 41

e) Type of estimate Best estimate

6.6 Population size; Method used Complete survey or a statistically robust estimate

6.7 Short-term trend; Period 2013-2024

6.8 Short-term trend; Direction Decreasing

6.9 Short-term trend; Magnitude

a) Estimated minimum

b) Estimated maximum

c) Pre-defined range Decreasing 0 - 12%

d) Unknown No

e) Type of estimate Best estimate

f) Rate of decrease	Decreasing >1% (more than one percent) per year on average
6.10 Short-term trend; Method used	Based mainly on extrapolation from a limited amount of data
6.11 Long-term trend; Period	2000-2024
6.12 Long-term trend; Direction	Decreasing
6.13 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Confidence interval	
d) Rate of decrease	
6.14 Long-term trend; Method used	Based mainly on extrapolation from a limited amount of data
6.15 Favourable Reference Population (FRP)	
ai) Population size	154
aii) Unit	number of localities
b) Pre-defined increment	
c) Unknown	No
d) Method used	Expert opinion
e) Quality of information	moderate
6.16 Change and reason for change in population size	
a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	
d) Different method	
e) No information	

f) Other reason**g) Main reason**

Genuine change

6.17 Additional information

Population sizes vary from year to year, fluctuating from one or two individuals to many tens of thousands making the use of a proxy measure of population essential. The number of map 1x1 km grid cells (grids1x1) was used as the main measure in the 2019 England report (JNCC 2019a) with number of localities as the additional measure, but in the UK report (JNCC 2019b), the main measure used was the number of localities with no additional population measure utilised. In 2019 localities were defined as sites bearing different names, without subsites. Therefore, for instance, 'Braunton Burrows' is counted as a single locality, despite there being separate populations (and possibly subsites) within it. In reality the number of localities and monads are very similar to one another and monads is the easier and more definitive unit to use in terms of analysis. In 2019 in England there were 75 occupied monads (in the time period 2013-2018), and 70 localities, with a further one locality in Wales, so the UK total was 71 localities at that time, less than half the FRP. The UK FRP was set at 154 localities (England = 152 localities and Wales = 2 localities), based on 2005 data. This FRP value was used in 2013 and 2019 and is 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. In this reporting period (2019-2024) there are 38 recorded localities, a decline from 70 localities in England (JNCC 2019a) for the period 2013-2018, even though there has been a dip in recording effort this decline is likely to exceed that which would be expected from that effect alone, and considering pressures are known to still exist, this is likely to reflect a genuine change. If using 1x1 km grid squares the declining trend is more easily followed: 2000-2013 (105), 2007-2012 (60); 2013-2018 (75); 2019-2024 (41). The peak during the period 2013-2018 is likely attributed to increase in recording effort for Plant Atlas 2020. If we assume that recording levels fell back to 'normal' in the ensuing time period there has been a decline in occupied monads (proxy for population) in the short and long term.

6.18 Age structure, mortality and reproduction deviation

No deviation from normal

7. Habitat for the species**7.1 Sufficiency of area and quality of occupied habitat (for long-term survival)**

a) Is area of occupied habitat sufficient?	Unknown
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b) Is quality of occupied habitat sufficient?	Unknown
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c) If No or Unknown, is there a sufficiently large area of unoccupied habitat of suitable quality?	Unknown
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7.2 Sufficiency of area and quality of occupied habitat; Method used

a) Sufficiency of area of occupied habitat; Method used	Insufficient or no data available
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b) Sufficiency of quality of occupied habitat; Method used	Insufficient or no data available
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7.3 Short-term trend; Period	2013-2024
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7.4 Short-term trend; Direction	Decreasing
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7.5 Short-term trend; Method used	Based mainly on extrapolation from a limited amount of data
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7.6 Long-term trend; Period	2000-2024
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7.7 Long-term trend; Direction	Decreasing
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7.8 Long-term trend; Method used	Based mainly on extrapolation from a limited amount of data
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7.9 Additional information

Assuming the decline in population is real due to continued loss of sites and the FRV to be representative of range in the first reporting round, then it is reasonable to assume that either habitat quality or quantity, or both, is currently insufficient to maintain a favourable population of the species. However, it is 'unknown' whether there is sufficient area of habitat remaining even if the habitat quality could be optimised for the species, which has become difficult to do, especially at isolated sites, due to exacting requirements. It is not just the overall area but the size and degree of fragmentation of remaining parcels that is influencing sufficiency in area. Although we do not currently hold accurate data on the loss of suitable grassland, there is a body of evidence to

suggest gradual deterioration of unimproved grassland. Although this cannot be quantified using existing data, observations suggest that habitat has declined in both area and quality. Populations have also been lost due to habitat fragmentation. For instance, Stewart et al. (1994) states: ‘Most fragments of surviving grasslands are unsuitable as the cessation of traditional grazing regimes has allowed rank grassland and scrub to replace the closely grazed swards required by this species. Populations within Sites of Special Scientific Interest (SSSIs) and nature reserves are still threatened because of the practical difficulties of grazing grassland fragments, cliff edges and coastal slopes.’ There is also a difficulty within fragmented sites in balancing the requirements of this species with other species worthy of conservation as it requires short grazed grassland but with relaxation of grazing and hence trampling at the appropriate time to enable successful flowering and seed set. Many localities have been lost as a result of quarrying or through the ploughing up or fertilising of chalk grassland for agriculture or by the invasion of coarse grasses or scrub. Decline in habitat quality was also noted in Wilson’s survey (Wilson, 2017) where 8 of the sites were considered to be in unfavourable condition in terms of vegetation structure in 2017 compared with 6 in 2008, but was a mixed picture with some positive change (13 of the sites were considered to be in ideal condition in terms of vegetation structure in 2017 compared with 9 in 2008).

8. Main pressures

8.1 Characterisation of pressures

Table 3: Pressures affecting the species, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
PA05: Abandonment of management/use of grasslands and other agricultural and agroforestry systems (e.g. cessation of grazing, mowing or traditional farming)	Ongoing and likely to be in the future	Medium (M)
PA02: Conversion from one type of agricultural land use to another (excluding drainage and burning)	Ongoing and likely to be in the future	High (H)
PA07: Intensive grazing or overgrazing by livestock	Ongoing and likely to be in the future	High (H)

PA13: Application of natural or synthetic fertilisers on agricultural land	Ongoing and likely to be in the future	Medium (M)
PJ03: Changes in precipitation regimes due to climate change	Ongoing and likely to be in the future	Medium (M)
PJ01: Temperature changes and extremes due to climate change	Ongoing and likely to be in the future	Medium (M)
PK04: Atmospheric N-deposition	Ongoing and likely to be in the future	Medium (M)

8.2 Sources of information

See section 14 References

8.3 Additional information

No 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 Both inside and outside National Site Network

9.4 Response to measures Medium-term results (within the next two reporting periods, 2025–2036)

9.5 List of main conservation measures

Table 4: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
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MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land	Medium (M)
MA03: Maintain existing extensive agricultural practices and agricultural landscape features	High (H)
MA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	High (H)
MA05: Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	High (H)
MJ01: Implement climate change mitigation measures	Medium (M)
MA11: Reduce/eliminate air pollution from agricultural activities	Medium (M)

9.6 Additional information

Measures to improve management of remaining habitat can be delivered through mechanisms on designated and undesignated sites. Designated sites for this species include SACs (Natura 2000 sites) - 35 of 70 monads reported in 2013-2018 were within Natura 2000 sites. There is limited data (Wilson, 2017) to suggest that these sites have fared better than the wider countryside and populations here in less rapid decline, possibly even stable at some sites. However, targeting of agri-environment schemes, nature and species recovery initiatives at landscape scale for species-rich calcareous grassland sites that hold this species are all plausible methods that could improve habitat quality of existing sites and recovery of lost populations where recently lost due to habitat degradation. The potential for re-creation of calcareous grassland, such as arable reversion on historic sites that are able to support this species is less certain and would need research, trials and investigation.

10. Future prospects

10.1a Future trends of parameters

ai) Range	Very Negative - decreasing >1% (more than one percent) per year on average
bi) Population	Very Negative - decreasing >1% (more than one percent) per year on average
ci) Habitat for the species	Negative - slight/moderate deterioration

10.1b Future prospects of parameters

aii) Range	Poor
bii) Population	Poor
cii) Habitat for the species	Poor

10.2 Additional information

The main threats are abandonment of grazing, undergrazing, intensification of grazing (fertiliser, reseeding), change from grassland to arable cultivation and other land uses that result in reduction of area or quality of unimproved calcareous grassland. Climate change and atmospheric deposition of nitrogen (APIS, 2025) will also affect the habitat quality and interact with management practices, for example increased vigorous grass growth, all of which will require even more responsive land management, and creating habitat/grazing networks to mitigate against these effects. The pressures on the species are ongoing, and despite there having been some successes in stabilising losses at some sites, the management of the grasslands to maintain suitable conditions is ongoing, reliant on conservation efforts which need to be sustained or normalised into the nature recovery agenda.

11. Conclusions

11.1 Range	Unfavourable-inadequate (U1)
11.2 Population	Unfavourable-bad (U2)
11.3 Habitat for the species	Unfavourable-inadequate (U1)
11.4 Future prospects	Unfavourable-bad (U2)
11.5 Overall assessment of Conservation Status	Unfavourable-bad (U2)
11.6 Overall trend in Conservation Status	Deteriorating

11.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.8 Additional information

No additional information

12. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network

a) Unit	number of localities
b) Minimum	17
c) Maximum	28
d) Best single value	
12.2 Type of estimate	Best estimate
12.3 Population size inside the network; Method used	Based mainly on expert opinion with very limited data
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	Based mainly on expert opinion with very limited data
12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction	Decreasing
12.7 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Method used	Based mainly on expert opinion with very limited data

12.8 Additional information

During the time period 2010-2024 corresponding to the date range for the distribution map, 62 of a total of 115 monads were contained within SACs (54%). In the previous reporting round (2013-2018) the minimum value was estimated to be 34 monads (1x1km grid cells) within the Natura 2000 network, a little less than half the total of 75 occupied monads (in the time period 2013-2018), which equated to approximately 70 localities (JNCC 2019a). A declining trend has been observed in the England population as whole (inside and outside the network), using 1x1 km grid squares: 2000-2013 (105), 2007-2012 (60); 2013-2018 (75); 2019-2024 (41). The peak during the period 2013-2018 is likely attributed to increase in recording effort for Plant Atlas 2020, but if we assume that recording levels fell back to 'normal' in the ensuing time period there has been a decline in occupied monads (proxy for population) in the short and long term. The decline is assumed to also apply, but to a lesser extent within the network, given that some of the pressures exert an influence at large scale and are not necessarily related to direct site management effects. Minimum and maximum values have been estimated for proportion of monads within the Natura 2000 network.

13. Complementary information

13.1 Justification of percentage thresholds for trends

No justification information

13.2 Trans-boundary assessment

No trans-boundary assessment information

13.2 Other relevant information

No other relevant information

14. References

Biogeographical and marine regions

4.2 Sources of information

APIS, 2025 Air Pollution Information System website accessed March 2025: <https://www.apis.ac.uk/node/966>

BSBI Distribution Database (BSBI, DDb, accessed January 2025)

JNCC, 2019a. '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*) ENGLAND'. <https://jncc.gov.uk/jncc-assets/Art17/S1654-EN-Habitats-Directive-Art17-2019.pdf>

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Stewart, A., Pearman, D.A. & Preston, C.D. 1994. 'Scarce Plants in Britain.' Peterborough: Joint Nature Conservation Committee

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Winfield, M.O., Wilson, P.J., Labra, M. & Parker, J.S. 2003. 'A brief evolutionary excursion comes to an end: the genetic relationship of British species of *Gentianella* sect. *Gentianella* (Gentianaceae).' *Plant Systematics and Evolution* 237: 137–151. doi:10.1007/s00606-002-0248-3

Main pressures

8.2 Sources of information

No sources of information

15. Explanatory Notes

Field label	Note
1.4: Alternative species scientific name	The species reported here is <i>Gentianella amarella</i> subsp. <i>anglica</i> (Pugsley) Rich & McVeigh (2019), endemic to Great Britain (England and Wales only). Various authors have regarded <i>Gentianella anglica</i> (Pugsley) E.F. Warb. as a species in the past, but molecular studies by Winfield et al. (2003) showed that it is part of <i>G. amarella</i> and indicated that it was of relatively recent origin. It is genetically similar to <i>G. amarella</i> , but flowers early and is morphologically distinct so can be reliably identified in the field (flowers with 1–3 internodes and the terminal internode contributing more than 40% to the stem height). Previous taxonomic classification: <i>Gentianella amarella</i> (L.) Börner subsp. <i>anglica</i> (Pugsley) Rich & McVeigh, comb. et stat. nov. Basionym: <i>Gentiana anglica</i> (Pugsley); <i>Gentianella amarella</i> var. <i>praecox</i> (F. Towns.).
2.1: Sensitive species	No evidence of any collection threat for this species or threat from other indirect effects (e.g. compaction or trampling) so not considered sensitive.
2.3: Distribution map	Data from BSBI Distribution database (Accessed January 2025)
2.2: Year or Period	The time period 2010-2024 has been used to provide a more representative current distribution for plant species in this reporting round. This is because the national dataset of botanical records (BSBI) could for many species, show a dip in records post 2020, an artefact of the relaxation in recording effort post production of the Plant Atlas 2020, therefore just utilising records from 2019-2024 has the potential to show a non genuine decrease. In preparation for the fourth report (JNCC 2019a) in the Species Recovery Trust (Wilson, 2017) visited 22 sites (a sample of the known localities reflecting the full ecological range and which were also surveyed in 2009). Although no comprehensive targeted surveys have taken place since 2017, the dataset for this species is considered reasonably complete for this report as recent records for populations were collated as

	part of the ongoing threat status review of vascular plants in Great Britain (Stroh, pers.comm. 2024).
2.4: Distribution map; Method used	Occupied hectads between 2010-2024 mapped, using data from BSBI Distribution Database (BSBI, DDb, accessed January 2025).
5.1: Surface area	The vast majority of records for this species are in England with only one locality in Wales. Unfortunately due to perceived insufficiencies in the data, the range value provided in 2019 was not accepted as representing a genuine surface area, therefore it is difficult to compare directly with the 2024 range value here, the reasons are explained fully in section 5.12. However, other means of analysing the data have been proffered, all of which point towards a genuine contraction in range. This is corroborated by studying hectad occupation; the distribution in 2018 (38 hectads) has declined to 32 hectads in the period since the last report (2019-2024). This likely indicates a genuine decline has occurred for this species between reporting rounds, given there are known pressures on populations, even and despite possible 'exaggeration' of decline due to reduced recording effort post Atlas 2020.
5.2: Short-term trend; Period	2013-2024, retained as the standard time period recommended (JNCC, 2024) despite difficulties of overlapping time periods with other analyses, and variation in recorder effort pre and post recording for Plant Atlas 2020.
6.5: Additional population size	Number of occupied 1km x 1km grid squares (monads) has been used in addition to number of localities due to the imprecision of the latter, vagaries of site naming by different recorders and difficulties of definition of locality as used in this context. Number of localities is nevertheless useful as a reference for charting change since this is a term that has been used in earlier reports, and since information is available from the BSBI dataset, both have been used in assessing populations.
5.3: Short-term trend; Direction	The data indicates a declining trend in range surface area in England since 2013 (14,673.47km ²) to 2024 (8644.6km ²)

utilising data for the time period 2010-2024). The latter time period was deliberately selected to account for change in recorder effort that may have occurred pre and post recording for the Plant Atlas 2020. Despite overlapping time periods making direct comparisons and calculations difficult there has been a clear decrease in surface area and this is corroborated by analyses carried out for the plant red list status review which does account for recorder effort, though data is only to 2020 (pers. comm. Stroh, 2024). Whilst the apparent decrease in population may be in part an artefact of recording effort as not all sites have been visited, the degree of decline is unlikely to be entirely explained by this, particularly since it is known that small and fragmented sites continue to be at high risk, and are occasionally lost, hence it is reasonable to report that the current trend is a decreasing one.

5.6: Long-term trend; Period	2000-2024 retained as the standard time period recommended (JNCC, 2024)
5.7: Long-term trend; Direction	The standard long term date period for range in this report is 2000-2024 and viewing the evidence in Plant Atlas 2020 over this time frame there has been a clear decline in hectad occupation, especially outside the core area on the chalk downlands of Hampshire, the Isle of Wight and Wiltshire, presumably due to spread of scrub and tall grasses where grazing levels have been reduced and possibly hybridization with subsp. amarella in some populations (Stroh et al, 2023). The current threat status review regards the species as having declined by about 25% between the 2nd and 3rd plant atlases (1987-2019) based on hectad counts (Stroh, pers.comm. 2024) with ongoing threats to many populations, meaning the species qualifies as Vulnerable (VU). If the current range (8644.6km ²) is taken as largely representative, there has been a clear decline since 2013 (14,673.47km ²), and almost certainly prior to this, although no range calculation is available for the precise date of 2000.

7.1: Sufficiency of area and quality of occupied habitat

Assumptions are based on the apparent continued loss of sites (especially small sites) and widely reported problems in maintaining short species-rich calcareous grassland in suitable condition for all stages of the life cycle of the plant. Grazing and trampling exposes bare ground enabling successful germination and later on, seeds to fall and reach bare ground, and also reduces competition enabling good seedling growth. However, relaxation of grazing at the right point is necessary as it enables the plants to flower and ripen seed without being unduly damaged by trampling, but shortly thereafter grazing would again be ideal to provide bare ground, enabling ripe seed to fall on openings in the sward. This regime is difficult to manage on small, inaccessible sites, and would have happened more naturally within much larger interconnected grazing areas with animals moving around, and losses in certain areas, or damage in certain years, mitigated by other successful colonies.