

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

2019-2024

Conservation status assessment for the species:

S1902 - Lady's-slipper orchid

(Cypripedium calceolus)

England



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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.
- 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: Lady's-slipper orchid

Table 1: Table summarising the conservation status for S1902 - Lady's-slipper orchid (*Cypripedium calceolus*). 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-bad (U2)
Population (see section 6)	Unfavourable-bad (U2)
Habitat for species (see section 7)	Unfavourable-inadequate (U1)
Future Prospects (see section 10)	Unfavourable-inadequate (U1)

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National Level

1. General information

1.1 Country	England
1.2 Species code	S1902
1.3 Species scientific name	<i>Cypripedium calceolus</i>
1.4 Alternative species scientific name	
1.5 Common name	Lady's-slipper orchid
Annex(es)	II, IV

2. Maps

2.1 Sensitive species	Yes
2.2 Year or period	2010-2024
2.3 Distribution map	No
2.4 Distribution map; Method used	

2.5 Additional information

No distribution map has been produced for the report due to the sensitivity of the species to human disturbance.

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) 1,763.02

5.2 Short-term trend; Period 2013-2024

5.3 Short-term trend; Direction Increasing

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

5.5 Short-term trend; Method used Complete survey or a statistically robust estimate used

5.6 Long-term trend; Period 2000-2024

5.7 Long-term trend; Direction Increasing

5.8 Long-term trend;
Magnitude

a) Minimum

b) Maximum

c) Rate of decrease

5.9 Long-term trend; Method used	Complete survey or a statistically robust estimate
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5.10 Favourable Reference Range (FRR)

a) Area (km ²)	3,500
b) Pre-defined increment	
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

5.11 Change and reason for change in surface area of range

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

5.12 Additional information

A closely monitored species with annual monitoring since 1930, of wild and thereafter also of reintroduced populations, with the data primarily obtained by volunteers and reserve staff. In contrast to previous reports (native/wild only) the current range calculation is based on combining currently occupied wild and reintroduction sites. Inclusion of reintroduction sites is a viable approach as there are prospects that the reintroduction sites could become fully functioning populations, based on recent evidence of natural regeneration at one of the reintroduction sites (Walker, 2024). Range trends however remain stable, (previously stable including only the native/wild) and stable if considering also the reintroduction sites. The number of reintroduction sites has increased to 35 in this reporting round (22 in 2018) with the same 13 hectads occupied by the species within the native range since 2000 to 2024, with some reintroduction sites unsuccessful but others having brought into the recovery programme. Current range

1763.02km² with the inclusion of reintroduction sites is still only 50% of FRR, and is useful as an indication of the direction of travel of the reintroduction programme but it would be unrealistic to accept this as a genuine change simply on the basis of natural regeneration having been observed just once at one of the many reintroduction sites. Even if it was accepted as genuine change, the current range does not quite meet the operator 'between 51-100% smaller' than FRR.

6. Population

6.1 Year or period 2010-2024

6.2 Population size (in reporting unit)

a) Unit number of individuals

b) Minimum

c) Maximum

d) Best single value 100

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 adults

b) Minimum

c) Maximum 50

d) Best single value

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 Increasing

6.9 Short-term trend; Magnitude

a) Estimated minimum

b) Estimated maximum

c) Pre-defined range Increasing 0 - 12%

d) Unknown No

e) Type of estimate Best estimate

f) Rate of decrease

6.10 Short-term trend; Method used Complete survey or a statistically robust estimate used

6.11 Long-term trend; Period 2000-2024

6.12 Long-term trend; Direction Increasing

6.13 Long-term trend; Magnitude

a) Minimum

b) Maximum

c) Confidence interval

d) Rate of decrease

6.14 Long-term trend; Method used Complete survey or a statistically robust estimate used

6.15 Favourable Reference Population (FRP)

ai) Population size 2,000

aii) Unit number of individuals

b) Pre-defined increment

c) Unknown No

d) Method used Reference-based approach

e) Quality of information high

6.16 Change and reason for change in population size

a) Change Yes

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

6.17 Additional information

In the 2019 report the FRP was regarded as 2000 individuals, based on the following: If all proposed reintroductions were successful, there would be 13 sites with a minimum of 100 plants at each (1300) which would only just take the species out of IUCN Vulnerable category. This could be viewed as the minimum 'target' population, and to be stated as 'favourable', based on expert opinion, a buffer of 50 additional plants per site would give 2000 plants scattered throughout the favourable reference range and the outlier sites. The FRP value of 2000 has therefore been retained in this reporting round and whilst the reported number of individuals and flowering plants has apparently increased markedly since previous reports this is not a genuine change but is due to inclusion of plants at reintroductions sites. Whilst, none of the populations at the currently occupied sites (wild or reintroduced) could be described as self sustaining yet, due to natural population increase being so rare (vegetative or by sexual reproduction), the first known new seedling arising from natural regeneration in a reintroduced population was observed in 2024, representing a genuine change and increase and positive sign for the future and hence the data included here for perspective on the population in the recovery programme. The number of individuals currently 100, still falls far below the FRR of 2000 plants but has increased in the short and long term as the reintroduction programme has progressed. The number of reintroduction sites has increased from 22 to 35, and 13 sites in total had extant plants in 2024 (14 in 2018). This slight decrease of one occupied site (population) can not be read as significant due to the vagaries of obtaining accurate counts.

6.18 Age structure, mortality and reproduction deviation Yes, strongly deviating 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?	No
b) Is quality of occupied habitat sufficient?	No
c) If No or Unknown, is there a sufficiently large area of unoccupied habitat of suitable quality?	No

7.2 Sufficiency of area and quality of occupied habitat; Method used

a) Sufficiency of area of occupied habitat; Method used	Based mainly on expert opinion with very limited data
b) Sufficiency of quality of occupied habitat; Method used	Based mainly on expert opinion with very limited data

7.3 Short-term trend; Period 2013-2024

7.4 Short-term trend; Direction Increasing

7.5 Short-term trend; Method used Based mainly on expert opinion with very limited data

7.6 Long-term trend; Period 2000-2024

7.7 Long-term trend; Direction Increasing

7.8 Long-term trend; Method used Based mainly on expert opinion with very limited data

7.9 Additional information

Intensive conservation effort has increased the number of reintroduction sites to 35 but in 2024 only 13 of these supported plants, indicating that the habitat is sub-optimal at many of these reintroduction sites for the plants to successfully establish. However, it is not yet known which environmental parameters are critical and the presence of mycorrhizal fungi is likely to be highly influential. The plants in the reintroduction programme can only be raised asymbiotically as the mycorrhizal associations have not yet been isolated, and this could result in reduced resilience to sub-optimal environmental conditions at the time of planting out. Isotope analysis of introduced plants following introduction has shown mycorrhizal associations indistinguishable from

those of wild plants. Chance climatic events could dictate which plants survive the initial stresses of planting out, before they are able to form associations with mycorrhizal fungi. The first new seedling by natural regeneration was at a long established reintroduction site, where the period of time involved and the number of reintroduced plants may have resulted in a more favourable soil microflora. Despite these uncertainties, the fact that more unimproved limestone grassland sites have been brought into the reintroduction programme means that an increasing trend has been applied to the extent and quality of habitat in the short and long term time periods. The other consideration is that the wild/native site discovered in the 1930s is has changed in character, with colonisation by ash trees (now dying), also Hazel and possible drying and change in species composition of ground flora, and there has been no natural (sexual) reproduction of the plants at that site, so the habitat here though extant through persistent annual management, must be sub-optimal in unknown ways (either environmental factors, availability of pollinators, reduced plant fitness, climatic, hydrological or in combination effects).

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
PG12: Illegal harvesting, collecting and taking of plants and fungi	Ongoing and likely to be in the future	High (H)
PJ01: Temperature changes and extremes due to climate change	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)

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	Increase the population size and/or improve population dynamics (related to 'Population')
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
MS03: Restoration of habitat of species from the directives	High (H)
MG04: Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	High (H)
MS01: Reinforce populations of species from the directives	High (H)

9.6 Additional information

The reintroduction programme has been underway for over 30 years, with the dual purpose of re-establishing the former range and increasing the number of populations within this range. Historically there are thought to have been as many as 25 hectads within the native range and the recovery programme has achieved 13 hectads with extant plants but none of these populations could be described as truly self sustaining yet, though there are positive signs that this could become a reality, with the discovery of the first naturally produced seedling at a reintroduction sites in 2024.

10. Future prospects

10.1a Future trends of parameters

ai) Range	Positive - increasing $\leq 1\%$ (one percent or less) per year on average
bi) Population	Positive - increasing $\leq 1\%$ (one percent or less) per year on average
ci) Habitat for the species	Positive - slight/moderate improvement

10.1b Future prospects of parameters

aii) Range	Good
bii) Population	Good
cii) Habitat for the species	Unknown

10.2 Additional information

Future trend in range and number of individuals and populations is positive if the recovery programme can be sustained but there is much uncertainty remaining as to whether the habitat quality is suitable to support self-sustaining populations, resulting in future prospects for habitat being unknown. Uncertainty remains around such factors as the conditions required for formation of mycorrhizal associations from germination through to successful maturation and availability of pollinators, that will result in self-sustaining populations. Furthermore detailed modelling/mapping of future likely climate envelopes for this species is recommended in order to build climate change resilience into the recovery programme and to ensure sufficiency of suitable habitat into the future.

11. Conclusions

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

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

Current conservation status remains unfavourable bad, due to current range, even including reintroduction sites remaining substantially less than the FRR; total population is still less than 10% of FRP; population structure still deviates strongly from normal due to lack of natural regeneration in both wild and reintroduction sites; and until all populations are demonstrably self sustaining the habitat has to be considered insufficient, certainly in terms of quality. However the fact that transplants are able to form mycorrhizal associations following translocation and that a new seedling arising from natural regeneration has been discovered at a reintroduction site in 2024 are positive signs for the future. This combined with ongoing conservation efforts provides a reasonable level of confidence in future trend in conservation status improving.

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 individuals
b) Minimum	25
c) Maximum	50
d) Best single value	
12.2 Type of estimate	Best estimate
12.3 Population size inside the network; Method used	Complete survey or a statistically robust estimate

12.4 Short-term trend of population size within the network; Direction

Stable

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

Based mainly on extrapolation from a limited amount of data

12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction

Uncertain

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

No additional information

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

The recovery programme for this species in the UK has finally, in 2024, produced a naturally regenerated seedling arising from natural pollination, seed set and germination at a long standing reintroduction site. The expectation is to see multiple new plants appearing over the next few years at this and other reintroduction sites but this is by no means certain. Much concerted conservation effort and research is still required to secure the future of the species.

14. References

Biogeographical and marine regions

4.2 Sources of information

Sources of information on location and distribution have not been listed due to the sensitivity of the species to human disturbance.

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:

S1902 Lady's slipper orchid (*Cypripedium calceolus*), ENGLAND'. <https://jncc.gov.uk/jncc-assets/Art17/S1902-EN-Habitats-Directive-Art17-2019.pdf>

JNCC, 2019b '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: S1902 - Lady's-slipper orchid (*Cypripedium calceolus*), UK'. <https://jncc.gov.uk/jncc-assets/Art17/S1902-UK-Habitats-Directive-Art17-2019.pdf>

JNCC, 2025 'UK guidance to be used when undertaking the 'Habitat Regulations reporting' of UK species. For use by statutory nature conservation body staff undertaking the UK Terrestrial and Marine Habitat Regulations Reporting 9a/3z. NON-BIRD SPECIES (Habitats Directive Annexes II, IV and V) Guidance for use for the Habitat Regulations reporting round, 2019-2024'. version 4, JNCC.

Hinde, A., 2019-2024, 'Annual Wild-site Reports to the *Cypripedium* Committee' Natural England, CONFIDENTIAL unpublished reports.

Walker, K., 2024 'Monitoring of *Cypripedium calceolus* reintroduction sites 2023 Dec 4 - 2023', report for *Cypripedium* Committee, Natural England, CONFIDENTIAL, unpublished report.

Main pressures

8.2 Sources of information

No sources of information

15. Explanatory Notes

Field label	Note
2.1: Sensitive species	It is one of the most sensitive vascular plant species in the UK flora and has been targeted on a number of occasions. The species is vulnerable to human disturbance by collection, but also trampling and compaction in pursuit of photographs, or simply to see the plant in flower.
2.2: Year or Period	The time period 2010-2024 has been deployed for hectad distribution but no map is published to protect the species from disturbance. It is a long lived species, and the longer time frame than the reporting period (2019-2024) enables fuller coverage of all localities.
2.4: Distribution map; Method used	For the first time in reporting distribution and range for this species, both native and extant reintroduction sites have been included. It is a well monitored species with information on sustainability of populations, enabling the judgement to be made to include the reintroduction sites on the basis that in 2024 the first naturally regenerated seedling was observed at a reintroduction site.
2.5: Additional information	Although no maps have been published in the report, reintroduction sites have been included in the analysis as they reflect the historic distribution of species having been targeted at localities within the known historic range which was in northern England only in the UK (Stroh et al, 2023).
5.1: Surface area	Surface area is currently 1763.02km ² (alpha hull 20km) including reintroduction sites. Hectad counts and range surface area include both extant native and reintroduction sites, the latter with populations located within the historic distribution for the species.
5.2: Short-term trend; Period	2013-2024, the standard time period as recommended in the guidelines (JNCC, 2025).
5.3: Short-term trend; Direction	The short term trend in range is more or less Stable. In the 2018 reporting round, the wild plants were still extant. At that time, although not included in previous reports, 22 sites had been used in the reintroduction programme and in 2018 approximately 19 of these remained occupied, with

	<p>flowering at 14 of them. In this reporting round, the wild plants remain extant, and the number of reintroduction sites has increased to 35, all within the native range, and in 2024 in total 13 sites supported plants, several of which were flowering plants. The slight decrease of one site supporting plants can not in isolation be construed as a decrease in the population due to vagaries of counting plants accurately and in distinguishing sites. At the hectad level, occupation has remained stable since 2000 with the same 13 hectads occupied by wild and reintroduced plants.</p>
5.5: Short-term trend; Method used	<p>Extant reintroduction sites have been included in this reporting round, unlike in previous reports. The species has been well monitored since the rediscovery of the species in the wild in the 1930s, and all plants in wild and semi-natural reintroduced situations have been annually recorded in detail by a network of staff and volunteers, with a few exceptions due to staff turnover etc. In addition genetic analysis has enabled genetic provenance of plants to be distinguished, such that the dataset is considered robust and complete as far as is reasonably possible.</p>
5.6: Long-term trend; Period	<p>2000-2024 standard time period as recommended by the guidelines (JNCC, 2025).</p>
5.7: Long-term trend; Direction	<p>The long term trend in range is more or less Stable, with number of occupied hectads remaining the same over the period from 2000-2024 as a result of conservation actions with some reintroduction sites failing and others being brought into the recovery programme.</p>
5.9: Long-term trend; Method used	<p>The current range calculation is based on combining currently occupied wild and reintroduction sites, considered to be a viable approach as there are prospects that the reintroduction sites could become fully functioning populations, based on recent evidence of natural regeneration at one of the reintroduction sites (Walker, 2024). The short and long term trend in range are reported as stable in this report, because the increase in current range value compared with 2018 is a non genuine change due to a difference in methodology, ie the inclusion of reintroduction sites. The short and long term range trends</p>

	<p>remain stable in both situations (inclusion or exclusion of reintroduction sites).</p>
<p>5.10: Favourable Reference Range (FRR)</p>	<p>The FRR value of 3500km² was set in the 2007 report and represents a range similar to the historic English range. The FRR was set on the following basis: the historic range was calculated using the alpha software with the northern most 10-km square in Cumbria excluded, giving an extent of occurrence of 3,926 km², and the FRR was set a little below this at 3,500 km². The value for FRR has been retained in all previous reports (2013, 2018) and in this report. It was 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. JNCC for this reporting round have recommended an operator for FRR set as: between 51 and 100% smaller.</p>
<p>5.11: Change and reason for change in surface area of range</p>	<p>For the duration of previous reporting rounds the range was reported as stable at 100km² (JNCC 2019a) including only the locality for the wild site, where the plant survived being a long lived species, and despite not regenerating naturally was regarded as stable. Despite augmentation at the wild site to increase the likelihood of natural regeneration this has not yet occurred. In this report, reintroduction sites which are within the historic range have been included which increases the current range considerably (1763.02km²), but should be seen in context. This apparent increase is an artefact of methodology, based on new knowledge that leads to justification for inclusion of the reintroduction sites. The inclusion of reintroduction sites is on the basis that in 2024 the first naturally regenerated seedling was recorded at a reintroduction site, indicating that reintroduction sites do have the potential to become self sustaining populations. This increase in current range value does not represent a genuine change, and should be treated with caution as there is much uncertainty remaining as to whether this and other reintroduced populations will become fully self sustaining. However the current range value 1763.02 km² gives an idea of how closely the reintroduction programme if successful in the long term,</p>

	<p>would match the FRR as set in 2007 (3500km²), and is still only at 50% of previous range. Range alone does not give a complete picture - historically there are thought to have been as many as 25 occupied hectads within the native range and the recovery programme has so far achieved 13 hectads with extant plants.</p>
5.12: Additional information	<p>As a result of the reintroduction programme, the same 13 hectads have been continuously occupied by the species within the native range from 2000 to 2024. Although not all reintroduction sites within these hectads have proved persistent, new sites have been brought into the programme in an attempt to establish further populations. Many of these plants have yet to mature sufficiently to flower, so uncertainties remain about the future prospects at these locations. Therefore although current range with the inclusion of reintroduction sites gives a range close to the FRR, it would be unrealistic to deploy this as a valid current range, therefore an operator remains in place that current range is 51-100% smaller than FRR.</p>
6.2: Population size	<p>In the 2019 report the FRP was regarded as 2000 individuals, based on the following: If all proposed reintroductions were successful, there would be 13 sites with a minimum of 100 plants at each (1300) which would only just take the species out of IUCN Vulnerable category. This could be viewed as the minimum 'target' population, and to be stated as 'favourable', based on expert opinion, a buffer of ~50 additional plants per site would give ~2000 plants scattered throughout the favourable reference range and the outlier sites. This is regarded as a realistic value and is biologically meaningful, as there would be sufficient plants to ensure the main pollinator bee genus <i>Andrena</i> can image <i>Cypripedium</i> as a pollen source and has the FRP value of 2000 has therefore been retained in this reporting round.</p>
6.3: Type of estimate	<p>The populations have been closely and consistently monitored at all sites since the 1930's, latterly almost entirely by volunteers, including: number of plants, vegetative and flowering shoots, number of flowering</p>

	shoots, number of flowers, number of seed capsules produced (and whether artificially pollinated) and the origin and age of the reintroduced stock. Despite this monitoring programme, not every plant at every site is counted every year, and it is possible to miss plants and shoots, especially when herbivores visit first, so counts are considered best estimates.
6.5: Additional population size	There are an estimated 50 mature plants, and a total population of approximately 100 individuals living in semi-natural situations. Plants living ex-situ, of any age, in nurseries, collections and growing facilities are not included in the assessment. In 2024 the first known new seedling was recorded at a long established reintroduction site, arising from natural pollination, seed set and germination and indicates that the species can form self sustaining populations at a reintroduction site.
6.16: Change and reason for change in population size	The trends for population are reported as increasing at reintroduction sites, and despite the positive signs that these can become self-sustaining populations, should not be misinterpreted as a genuine increase since the 2019 report until such time as there is more evidence that reintroduced populations are genuinely sustainable.
6.18: Age structure, mortality and reproduction	Many of the plants at reintroduction and introduction sites are not yet mature enough to flower so it remains to be seen which of these populations will successfully produce flowers, set seed and produce seedlings, and thereby become fully functioning populations.
7.1: Sufficiency of area and quality of occupied habitat	The area of occupied habitat appears sufficient to sustain existing populations as it is lightly-grazed limestone grassland with some tree cover but plants at many of the reintroduction sites have not persisted so the habitat quality must be sub-optimal in some way, and natural pollination of flowers, seed set and germination remains very low, with the first confirmed new seedling at a reintroduction site in 2024. At several reintroduction sites survival of transplants is good, and it has been found that mycorrhizal conditions are suitable for mature plants to pick-up fungal associates providing the plants are able to survive the initial stresses

of planting out. So far it has been impossible to isolate fungal associates essential for germination nor to determine the nature of the mycorrhizal association of the new seedling discovered by natural regeneration at a reintroduction site in 2024. Therefore the extent of suitable habitat for germination in reality is unknown, assumed to be insufficient and the sufficiency of habitat of suitable quality remains uncertain despite the encouraging signs: improved survival of transplants in the reintroduction programme indicating that expert judgement of conditions despite lack of hard environmental data; first naturally pollinated and germinated seedling at a reintroduction site was discovered in 2024.

8.1: Characterisation of pressures

Illegal collection, and trampling as a consequence of photography remain pressures and both are ongoing threats, though perhaps less significant than in the past with more sites where the species can be seen to satisfy general curiosity and the species more widely grown ex situ. The recovery programme is at the point of balancing wider public knowledge of reintroduction sites with sensitivity of these sites. Achieving optimum habitat condition at sites is ongoing with additional likely pressures of effects of climate change on temperatures and rainfall. There is a recognised research need to improve knowledge of required environmental parameters in this country.

9.4: Response to the measures

More reintroduction sites within the historic native range, with surviving plants and an increase in the number of individuals are clear successes of the recovery programme, but achieving fully self-sustaining populations occupying previous numbers of hectads within the native range is not yet fully achieved.

12.1: Population size inside the pSCIs, SCIs and SACs network

The apparent increase in population size within the national site network since the last report is due to the inclusion of reintroduction sites, due to the positive signs that these can become self-sustaining populations, but should not be viewed as a genuine change until such time as there is

	more substantive evidence that natural regeneration in semi-natural populations is sustaining the populations.
12.2: Type of estimate	The species is closely monitored and the figures can be considered reasonably accurate.
12.8: Additional information	The same caveats apply to the inclusion of reintroduction sites; number of individuals; trends in range and populations over short and long term; pressures and measures, as applies for sites outwith the network. The inclusion of reintroduction sites in this report is considered valuable as it provides an indication of where the recovery programme could be heading, particularly with respect to the very early signs of successful natural regeneration at a reintroduction site having been observed in 2024.