European Community Directive

on the Conservation of Natural Habitats

and of Wild Fauna and Flora

(92/43/EEC)

Second Report by the United Kingdom under Article 17

on the implementation of the Directive

from January 2001 to December 2006

Conservation status assessment for :

S1283: *Coronella austriaca* - Smooth snake

S1283 *Coronella austriaca* Smooth snake

Audit trail compiled and edited by Joint Nature Conservation Committee, the Inter-Agency Herpetofauna Working Group and the Herpetofauna Conservation Trust

This document is an audit of the data and judgements on conservation status in the UK's report on the implementation of the Habitats Directive (January 2001 to December 2006) for this species. Superscript numbers accompanying the headings below, cross-reference to headings in the corresponding Annex B reporting form. This supporting information should be read in conjunction with the UK approach for species (see 'Assessing Conservation Status: UK Approach').

1. Range Information[2.3]

The smooth snake is restricted to the south of England.

1.1 Surface area of range[2.3.1]

4,289km^2

The above estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (see Map 1.1), at a resolution of 10 km. The value of alpha was set at 35 km to reflect the mobility of this species. The alpha hull (range area) was clipped to include inland habitat only.

Map 1.1. Current extent of occurrence and occupied 10 km-squares (1990-2006)

Data sources provided in Section 6

1.2 Date of range determination[2.3.2]
1990 – 2006
Recent records are patchy and incomplete. For this reason, the current date-class includes all records collected from 1990 onwards (from the data sources listed above). These records provide the best representation of current range as it is understood by species specialists.

## 1.3 Quality of range data[2.3.3]
Moderate
Due to the smooth snake's nature conservation status and restricted distribution, it has been subject to a relatively high level of survey. However, it is a cryptic species, and there are still thought to be significant gaps in knowledge with regards to range, particularly in areas such as the Thames Basin Heaths. For this reason, data quality is reported as moderate, rather than good.

1.4 Range trend[2.3.4] & Range trend magnitude[2.3.5]
Stable
Since the Habitats Directive came into force in 1994, range (at a 10 km scale) has most likely remained stable, with a possible increase since 2001 (J. Foster, *pers. comm.*).

Map 1.2. Historic extent of occurrence and occupied 10 km-squares (1800-1989)

Data sources provided in Section 6
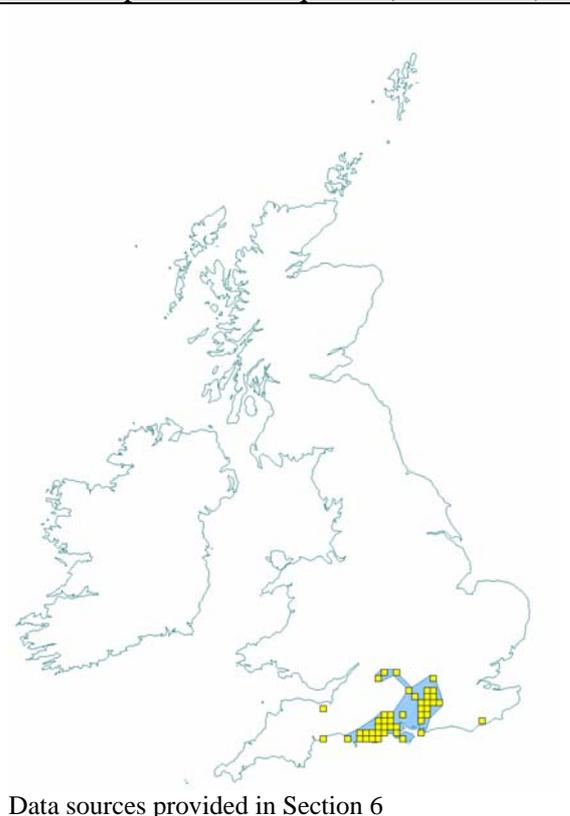
1.5 Range trend period [2.3.6]
1994 – 2006
The reported trend reflects the period after the Habitat Directive came into force.

1.6 Reasons for reported trend in range[2.3.7]
Not applicable

1.7 Favourable reference range[2.7.1]
4,760 km^2
The decision tree in Note 1 has been used as a guide in determining the favourable reference range estimate (see 'Assessing Conservation Status: UK Approach').

Map 1.2 shows the historical extent (8,248 km^2), calculated using records collected between 1800 and 1989. A comparison of this, and the current extent of occurrence (4,289 km^2), suggests 48% decline in range since the turn of the 19th Century. However, as a direct result of conservation action, this negative trend has been curbed in more recent years.

There is some debate, as yet unresolved, as to whether the current range is sufficiently comprehensive to support a viable UK population in the long-term. The present range is largely dependent on active conservation effort i.e. the species is not self sustaining. If intensive conservation were to be withdrawn, species specialists are not confident that the range would be sufficiently comprehensive to support viable populations in the long-term. However, any decline would be unlikely to exceed 1% per annum. (This judgement is based on knowledge of the species' ecology, its previous distribution and the potential to re-establish the species.)

Therefore, in accordance with the UK approach, the favourable reference range has been identified as 10% greater than the current estimate.

1.8 Range conclusion[2.8]
Unfavourable – Inadequate but improving
The favourable reference range is more than the current estimate, but not by a factor more than 10%. The range conclusion is therefore Unfavourable – Inadeqaute, but improving to reflect post-2001 trends (attributed to conservation action).

2. Population of the species[2.4]

2.1 Population estimate[2.4.1]
354 occupied 1-km squares
In 2005, it was estimated that smooth snakes were present in 354 1-km squares (Herpetofauna Conservation Trust (HCT) Rare Species Database) though it should be noted that not all populations are known hence the figure is likely to be higher than this.

2.2 Date of population estimate[2.4.2]
2005

2.3 Method of population estimate[2.4.3]
2 = extrapolation from surveys of part of the population, sampling
The above estimate was calculated by overlaying all survey areas with 1-km squares.

2.4 Quality of population data[2.4.4]
Moderate

Population assessments are not well-developed for this species. Although attempts have been made to estimate population number, these are not (as yet) thought to provide a suitable baseline, due to the difficulty in defining where a smooth snake 'population' begins and where it ends. Because of this, the number of occupied 1-km squares is used here as a proxy. However, due to gaps in current knowledge, this approach can not be considered comprehensive. Data quality is therefore reported as moderate, rather than good.

2.5 Population trend[2.4.5] & Population tend magnitude[2.4.6]
Stable
Since the Habitats Directive came into force in 1994, populations are thought to have stabilised, and possibly even increased, as a direct result of improved heathland management. On this basis, trend is reported as stable.

2.6 Population trend period[2.4.7]
1994 – 2006
The reported trend reflects the period after the Habitats Directive came into force.

2.7 Reasons for reported trend in population[2.4.8]
Not applicable
Historic declines have been attributed to habitat loss through agricultural intensification, afforestation and development; habitat fragmentation by agriculture and development; a reduction in habitat suitability caused by successional change (resulting from a lack of management); a reduction in habitat suitability following unsympathetic management (notably burning, grazing); encroachment of habitat by invasive plant species; arson; and degradation of habitat by increased public access.

Re-introduction schemes, positive habitat management and restoration are thought to have reduced these impacts in recent years.

2.8 Justification of % thresholds for trends[2.4.9]
Not applicable

2.9 Main pressures[2.4.10]
100 cultivation
160 general forestry management
300 sand and gravel extraction
400 urbanised areas, human habitation
410 industrial or commercial areas
500 communication networks
601 golf course
950 Biocenotic evolution (succession)
800 landfill etc.

2.10 Threats[2.4.11]
101 modification of cultivation practices
390 mineral extraction activities not referred to above
400 urbanised areas, human habitation
410 industrial or commercial areas
500 communication networks

800 landfill etc.
950 Biocenotic evolution (succession)
965 predation

2.11 Favourable reference population[2.7.2]
395 occupied 1km-squares
The decision tree in Note 1 has been used as a guide in determining the favourable reference population estimate (see 'Assessing Conservation Status: UK Approach').

This species has suffered historic declines in population, concurrent with declines in the Dorset and Weald heaths. This is supported by the large decline in the number of occupied 10-km squares reported since the turn of the 19th century (historical data at a 1 km resolution is not available, so a comparison at this finer scale cannot be made); historical area of occupancy (shown in Map 1.2) was 42, whereas current area of occupancy (shown in Map 1.1) is 33, suggesting a decline of 35%. Further, expert opinion is that even this magnitude is an underestimate. Since the 1800s, heathland habitat is thought to have declined my more than 84% (refer to Section 3.2 Habitat trend), and it is likely that historical smooth snake population trends will have mirrored this.

The current stable population is attributed largely to intensive conservation care.

Based on this, and a professional understanding of the species, the current population estimate is not sufficiently large to ensure the long-term viability of the species. In deriving a value for favourable reference population an estimate has been made based on what the population level should be 12-15 years hence. Favourable reference population is thus given as within 10% of current estimates.

2.12 Population conclusion[2.8]
Unfavourable – Inadequate but improving
The current population has been identified as below the favourable reference population, but not by more than 10%. Therefore, in accordance with Annex C, the conclusion is Unfavourable – Inadequate. The additional judgment of 'improving' reflects the positive effects of re-introduction schemes and positive habitat management.

3. Habitat for the species in the Biogeographic region or sea[2.5]
This species is predominantly confined to dry lowland heath, but occasionally using woodland margins and bogs adjacent to heath. Generally attracted to features with sunny slopes and diverse vegetation structure (Gent & Gibson, 2003).

3.1 Surface area of habitat[2.5.2]
238.5km^2
An unpublished report by the HCT in 2005 suggests that smooth snakes utilise a core habitat area 7,280 ha, with a buffer of 23,850 ha. This estimate is based on site inventory data held in the HCT Rare Species Database.

3.2 Date of estimation[2.5.3]
2005

3.3 Quality of data on habitat area[2.5.4]
Good

3.4 Habitat trend[2.5.5]
Increasing
About 70,000 ha of lowland heathland remain in the UK, which represents approximately 16% of its extent in the 19th century. Many heaths have been lost due to afforestation, development and agricultural practices (source: www.jncc.gov.uk/page-1432).

3.5 Habitat trend period[2.5.6]
2001 – 2005
The period of the last UK Biodiversity Action Reporting round.

3.6 Reasons for reported trend in habitat[2.5.7]
3 = Direct human influence (restoration, deterioration, destruction)
Historically, increased use of technology to reclaim infertile areas for agriculture and forestry; large-scale mechanical extraction of sand and gravel; and urban encroachment, have all played a role in the decline of lowland heaths. Habitat re-creation and restoration efforts in recent years are attributed with reversing this negative trend.

3.7 Suitable habitat for the species (in km^2)[2.7.3]
Unknown

3.8 Habitat conclusion[2.8]
Unfavourable – Inadequate but improving
Although lowland heath shows signs of recovery, the area and quality are not yet at favourable status. Further, despite re-creation efforts, this habitat continues to be under threat from a lack of the appropriate management, required to maintain remaining fragments in a good condition. It is therefore assessed as Unfavourable and, since there is no evidence to suggest that the habitat area "is clearly not sufficiently large to ensure the long term survival of the species", or that "habitat quality is bad, clearly not allowing long term survival of the species", in accordance with Annex C, the judgement is Inadequate, rather than Bad. Habitat is classified as improving to reflect the recent trend.

4. Future Prospects[2.6]
Good prospects
"Species is expected to survive and prosper."

Agri-environment schemes now better targeted and with good incentives, and should encourage habitat retention, enhancement and creation. Planning system and associated mechanisms are now increasingly likely to recognise the presence of the species and avert adverse impacts, whilst ensuring compensation where there are some impacts; most sites are in any case on protected areas. New emphasis on habitat creation in planning could, in theory, result in gains. General habitat creation schemes are more likely to take smooth snakes into account. New guidance on habitat management is being prepared (to be published 2007).

Smooth snake has been added to the UK Biodiversity Action Plan (BAP) priority list; this should alert many to the requirements of the species. New legal duty (Nature Conservation

(Scotland) Act 2004, NERC Act 2006) should mean that public bodies take greater account of the species.

However, these positive comments rely on the mechanisms described being implemented in a way that benefits smooth snake populations. In practice, it remains to be seen whether the potential for positive gains will be achieved on the ground. Even with many of these mechanisms working, it will take many years to compensate for the substantial historical population losses. In addition, major losses still occur locally through arson.

4.1 Future prospects conclusion[2.8]
Favourable

5. Overall Conclusion [2.8]
Unfavourable – Inadequate but improving
Range, population and habitat have been assessed as Unfavourable – Inadequate but improving; and future prospects as Favourable.

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Unfavourable – Inadequate but improving	Any other combination Current range is below the favourable reference range, but stable and showing signs of recent improvement	3
Population	Unfavourable – Inadequate but improving	Any other combination Current range is below the favourable reference range, but stable and showing signs of recent improvement	3
Habitat	Unfavourable – Inadequate but improving	Any other combination Although habitat is recovering following historic decline, it is not yet sufficiently large or of adequate quality, to support the species at favourable status	2
Future Prospects	Favourable	Main pressures and threats to the species not significant; species will remain viable in the long-term	2
Overall Assessment	Unfavourable – Inadequate but improving	One or more Unfavourable – Inadequate Future prospects are Favourable, and range population and habitat are showing signs of improvement	1

*1=High, 2=Moderate, 3=Low

High – Expert opinion is that the concluding judgement accurately reflects the current situation based on a professional understanding of the species. For range, population, and habitat, quality of data used to establish the current estimate has been identified as "good"; data used to inform trends is comprehensive and up to date.

Moderate – A greater understanding of the feature, or the factors affecting it, is required before a confident concluding judgement can be made by experts. For range, population, and habitat, the current estimate and/or

trend are based on recent, but incomplete or limited survey data; or alternately, a comprehensive, but outdated (pre-1994) review.

Low – Judgements, and comprising estimates, are based predominately on expert opinion.

N/A – Assessment conclusion is "unknown", on the basis of insufficient reliable information.

6. References

BEEBEE, T.J.C. & GRIFFITHS, R.A. 2000. *Amphibians and reptiles: A natural history of the British herpetofauna*. The New Naturalist series. London: Harper Collins.

COOKE, A.S. & SCORGIE, H.R.A. 1983. *The status of the commoner amphibians and reptiles in Britain.* Huntingdon: Nature Conservancy Council.

GENT, T. & GIBSON, S .2003. *Herpetofauna Workers' Manual*. Peterborough: Joint Nature Conservation Committee.

GLEED-OWEN, C., BUCKLEY, J., CONEYBEER, J., GENT, T., MCCRACKEN, M., MOULTON, N., & WRIGHT, D. 2005. Costed plans and options for herpetofauna surveillance and monitoring. *English Nature Research Reports,* No. 663.

THE HERPETOLOGICAL CONSERVATION TRUST. 2005. *Evaluation of the 2005 Conservation Status of* Coronella austriaca *in the United Kingdom*. Working document, unpublished.

Map Data Sources

The Herpetofauna Conservation Trust Rare Species Database; Reptile Records for Wiltshire 1900 – 2003; and Reptiles and Amphibians Dataset (via the National Biodiversity Network (NBN) Gateway).