

**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 :
S1083: *Lucanus cervus* - Stag beetle**

Please note that this is a section of the report. For the complete report visit <http://www.jncc.gov.uk/article17>

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S1083 *Lucanus cervus* Stag beetle

Audit trail compiled and edited by JNCC and the Invertebrate Inter-Agency Working Group

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}

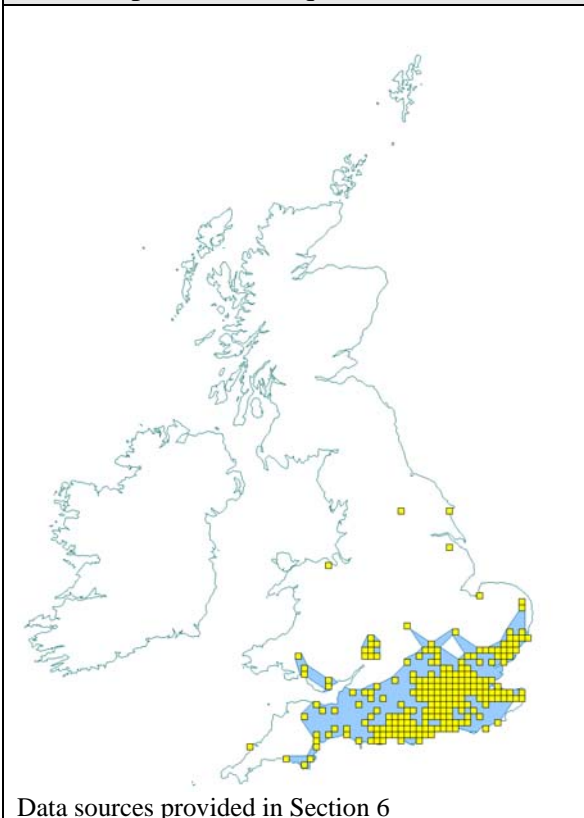
The stag beetle is relatively widespread in southern England, especially the Thames Valley, north Essex, south Hampshire and West Sussex. They are also found in the Severn Valley and coastal areas of the southwest. Elsewhere in Britain they are extremely rare or absent.

1.1 Surface area of range^{2,3,1}

42,883km²

The above estimate was calculated using records collected from 1998 onwards within the Alpha Hull software. Extent of occurrence was used as a proxy measure for range (see Map 1.1 below), at a 10km resolution. The value of alpha was set at 20km to reflect the mobility of this species.

Map 1.1 Current extent of occurrence and occupied 10-km squares (1998-2002)



It is thought that records north of the Wash/Mersey may be vagrants, but further investigation is needed to confirm this. For the moment, they are therefore included in the range calculations. Uncertainties also surround records in Wales and Shropshire. At least some Welsh records were accepted by the recent People's Trust for Endangered Species surveys; a small population in Cardiff was reported in 1998 and 2002. The Shropshire records are debatable, but there are entomologists who recall stag beetle populations in Staffordshire within the past 30 years (M. Smith *Pers. comm.*).

1.2 Date of range determination^{2.3.2}

1998 – 2002

The People's Trust for Endangered Species has undertaken three large surveys since the late 1990s, most recently in 2006. However, the most recent survey data is not yet available; hence current extent of occupancy reflects 1998-2002 records only.

1.3 Quality of range data^{2.3.3}

Good

Data are derived from a series of very large-scale public participation surveys with contributions from conservation and recording organisations and the general public right across the UK. More than 8,000 people reported over 14,000 stag beetle sightings during two surveys carried out in 1998 and 2002. 93% of records from the 2002 survey (2830) were confidently categorised as definite records. The data from a third survey carried out in 2006 have not been analysed yet.

1.4 Range trend^{2.3.4} and range trend magnitude^{2.3.5}

Stable

Recent recording has considerably increased our knowledge of this species' distribution. For this reason, the historic extent of occurrence (shown in Map 1.2) was mapped using all records from 1960 through to 2002, the assumption being that this species is likely to have always been present in those 10km-squares that have only recently been identified as a result of increased survey effort. Based upon this, historic extent of occurrence has been calculated at 46,520km². Since current range has been calculated as 42,883km², this suggests an 8% decline since the 1960s.

1.5 Range trend period^{2.3.6}

1960 – 2002

1.6 Reasons for reported trend in range^{2.3.7}

3. Direct human impact

The magnitude of this decline may be an artefact of the method of calculation (that is, inclusion of all current records in the historic calculation to counteract historic under-recording). However, populations have probably suffered historically from inappropriate management, i.e. removal of suitable trees and deadwood habitat, and this may have led to a slight decline in range.

1.7 Favourable reference range^{2.7.1}

42,883km² (Equal to current)

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').

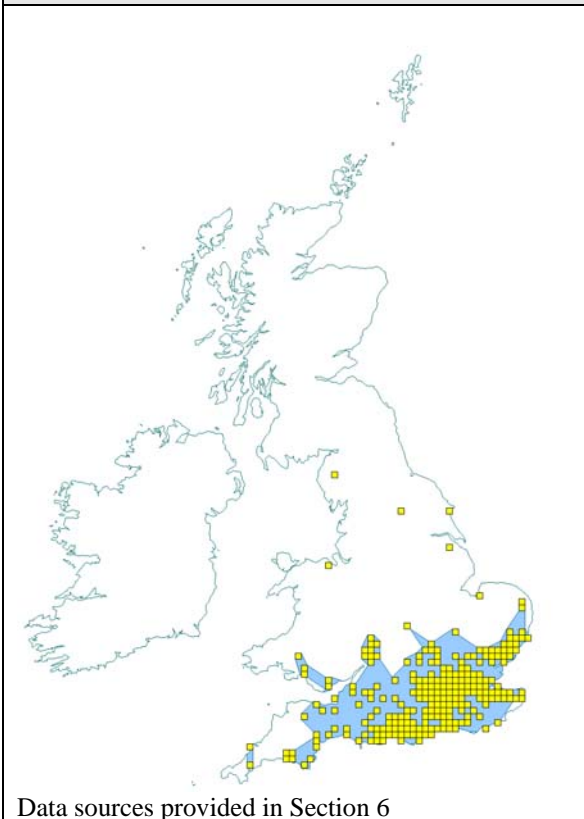
Although a slight historical decline has been reported, range is thought to be relatively stable at present, and it is thought to be sufficiently large to be considered viable in the foreseeable future. Thus, current range is a suitable favourable reference range.

1.8 Range conclusion^{2.8}

Favourable

Range appears not to have changed significantly if the more dubious northern records are discounted, and the favourable reference range has been set as equivalent to current range. The conclusion is therefore Favourable.

Map 1.2 Current extent of occurrence and occupied 10-km squares (1960-2002)



2. Population of the Species^{2.4}

2.1 Population estimate^{2.4.1}

228 occupied 10-km squares

From 1998-2002 survey data, *L. cervus* is known in 229 10-km squares (see Map 1.1).

2.2 Date of population estimate^{2.4.2}

1998 – 2002

2.3 Method of population estimate^{2.4.3}

3 = from comprehensive inventory

In the absence of true population data, the number of occupied 10km-squares has been used as a surrogate. The estimate was derived from extensive surveys undertaken by the People's Trust for Endangered Species, and the records held by the Invertebrate Site Register (for

England), as provided on the NBN Gateway. At this coarse scale, the estimate represents a complete inventory.

2.4 Quality of population data^{2.4.4}

Moderate

Extensive surveys were undertaken in 1998, 2002 and 2006 by the People's Trust for Endangered Species, and there was a good level of public participation across the species' full range. However, on the basis that population can only be estimated at a coarse 10km scale (and thus inhibits insight into the population at a local level) data quality is moderate, rather than good.

2.5 Population trend^{2.4.5} and population trend magnitude^{2.4.6}

Stable

Based on recent survey effort and discounting differences between years (this species has a 4-6 year life cycle and some cohorts are stronger than others), there is no evidence of change. Although fewer records were received in 2002 than in 1998, the proportion of records received from each county was very similar to that seen during the 1998 survey.

Further, records collected between 1960 and 2002 suggest that the historical number of occupied 10km-squares is 243, hence suggesting a decline of just 6% since the 1960s.

2.6 Population trend period^{2.4.7}

1998 – 2006

2.7 Reasons for reported trend in population^{2.4.8}

Not applicable

2.8 Justification of % thresholds for trends^{2.4.9}

Not applicable

2.9 Main pressures^{2.4.10}

166 Removal of dead and dying trees

This is likely to create problems for this dead wood feeding species. Stag beetle does not favour any particular species of tree; it does however have very specific micro-habitat requirements.

2.10 Threats^{2.4.11}

166 Removal of dead and dying trees

2.11 Favourable reference population^{2.7.2}

228 occupied 10-km squares (Equal to current)

Population is stable and not restricted. Therefore, based on the decision tree in Note 1 (see 'Assessing Conservation Status: UK Approach') and expert opinion, the current population is sufficiently large to be considered viable for the foreseeable future.

2.12 Population conclusion^{2.8}

Favourable

There is no evidence of a decline in numbers and the current range is equal to the favourable reference range. Therefore, in accordance with Annex C, the population assessment is Favourable.

3. Habitat for the Species in the Biogeographic Region or Sea^{2.5}

This species shows preference for damp, decaying timber subterranean habitats up to 50cm underground, especially tree stumps, mainly but not exclusively of broadleaved timber. It will occasionally breed in decaying wood of artificial structures and even, very occasionally, other decaying plant matter such as compost heaps. The soil type is important with most populations breeding in timber on warm alluvial soils. Soils over chalk appear to be less favoured and stag beetles are absent from areas with extensive underlying chalk, with the exception of alluvial soils in river valleys cutting through chalk downs etc.

3.1 Surface area of habitat^{2.5.2}

Unknown

3.2 Date of estimation^{2.5.3}

Not applicable

3.3 Quality of data on habitat area^{2.5.4}

Poor

Species has been very extensively surveyed and studied, including research from two PhD studentships. However, on the basis that we currently have no estimate for habitat area, the data can only be reported as poor for this purpose.

3.4 Habitat trend^{2.5.5}

Stable

Probably declining slightly through overall loss of trees and deadwood habitat within the landscape, though the sort of decaying timber resource that the species requires is less threatened than that required by most other dead wood invertebrates. Since the Habitat Directive came into force in 1994, it has most probably been stable.

3.5 Habitat trend period^{2.5.6}

1994 – 2006

3.6 Reasons for reported trend in habitat^{2.5.7}

Not applicable

3.7 Suitable habitat for the species (in km²)^{2.7.3}

Unknown

3.8 Habitat conclusion^{2.8}

Unknown

Although habitat has most probably remained stable since the Habitats Directive came into force, it can not be reported with any certainty that the area of habitat available is sufficiently large, or of suitable quality, to support the species at favourable status. The assessment is therefore unknown at this time.

4. Future Prospects^{2.6}

Good prospects

The species has caught public attention and its requirements are now recognised by at least some land management interests. There is no evidence for any extension of the range, and considering the very limited life cycle and feeding habitats of the adult the extension of the range would seem unlikely unless encouraged by an artificial programme. However, owing to a reasonably wide niche breadth it is able to use anthropogenic resources, including those in urban situations. Future prospects are therefore considered to be quite good.

4.1 Future prospects conclusion^{2.8}

Favourable

5. Overall Conclusion^{2.8}

Favourable

With the exception of habitat, which was unknown, all of the parameters have been judged as Favourable. Therefore, in accordance with Annex C, the overall conclusion is Favourable.

Table 5.1 Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Current population is stable and not smaller than the favourable reference range	1
Population	Favourable	Current population is stable, and not lower than favourable reference population	2
Habitat	Unknown	Insufficient reliable information available	N/A
Future Prospects	Favourable	Main pressures and threats to the species not significant; species will remain viable on the long-term	2
Overall Assessment	Favourable	Three Favourable and one Unknown	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 predominantly on expert opinion.

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

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Map Data Sources

People's Trust for Endangered Species survey data, and the Invertebrate Site Register – England (via the NBN Gateway).