

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 :  
**S1308: *Barbastella barbastellus* - Barbastelle**

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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## S1308 *Barbastella barbastellus* Barbastelle

*Audit trail compiled and edited by JNCC and the Inter-Agency Mammal 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<sup>2,3</sup>

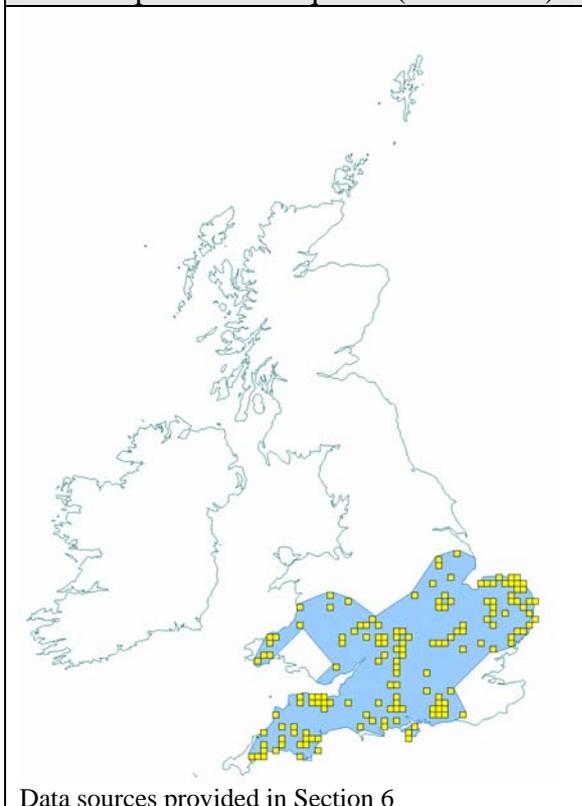
*Barbastella barbastellus* is found across south England and Wales; it is absent from Scotland and Northern Ireland. It is one of the UK's rarest mammals and is classified as Vulnerable in the IUCN Red List of Threatened Species (IUCN 2006).

#### 1.1 Surface area of range<sup>2,3,1</sup>

**80,939km<sup>2</sup>**

The above surface area estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (see Map 1.1). The value of alpha was set at 45 km to reflect the mobility of this species.

**Map 1.1** Current extent of occurrence and occupied 10-km squares (1980-2006)



## **1.2 Date of range determination<sup>2.3.2</sup>**

**1980 – 2006**

The date range indicated has been selected to reflect current range/surface area for the species for the following reasons:

- There are limitations in the quality of the data available. The largest dataset used, Distribution atlas of bats in Britain and Ireland (Richardson 2000) has data ranging from 1980-1999 but the year of recording for individual records within this dataset is not known, making it impossible to divide the data into different date ranges. Therefore, deviating from this time period would mean having to exclude these records, and since other datasets may not be fully comprehensive in isolation of these, such exclusion would be inappropriate.
- The greatest level of change affecting populations of this species probably occurred prior to 1980, and so 1980 to the present is likely to reflect current distribution and range.
- International treaties and national protective legislation affecting all European bat species came into force from 1980 onwards and is likely to have had an effect on their status.

## **1.3 Quality of range data<sup>2.3.3</sup>**

**Poor**

Since the early 1980s there has been an increase in the level of survey effort afforded to UK bat species following the increased level of protection in wildlife legislation, such as the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c) Regulations 1994 (and equivalent legislation in Northern Ireland), and a growing interest in wider conservation issues. However, there is still relatively little information on distribution of this species, and trend analysis is constrained by historic under-recording. For this reason data quality has been assessed as 'Poor'.

## **1.4 Range trend<sup>2.3.4</sup> & Range trend magnitude<sup>2.3.5</sup>**

**Unknown**

There is very little information to assess current trend in range for this species.

## **1.5 Range trend period<sup>2.3.6</sup>**

**1994 – 2006**

## **1.6 Reasons for reported trend in range<sup>2.3.7</sup>**

**Not applicable**

## **1.7 Favourable reference range<sup>2.7.1</sup>**

**80,939km<sup>2</sup> (Equal to current)**

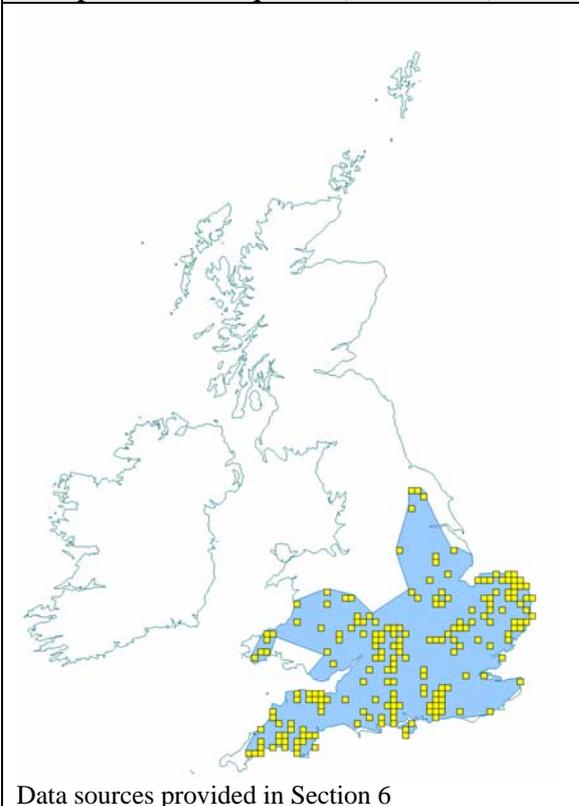
The favourable reference range value has been derived using 1994 as the baseline and making a judgement on whether the range in 1994 was sufficient to allow the long-term survival of the species, using the decision tree in Note 1 (see 'Assessing Conservation Status: UK Approach') as a guide. Historic and current information on range size and trends have been used to assess this and, if the 1994 level was not sufficient, then consideration has been given to what would constitute a large enough range.

The current range is probably no smaller than it was in 1994 and is of sufficient size to support a viable population of the species in the long-term. Furthermore, it is large enough to

allow for increase in distribution within the current range, and is therefore set as the favourable reference range.

In the early 20<sup>th</sup> century *B. barbastellus* was described as 'well-known, although not abundant' in Essex, Norfolk and Warwickshire, with definite colonies in Somerset, Worcestershire and Wales, and there were records from every county south of the Wash and east of the Dee (Harris *et al.* 1995). These authors concluded that it was widely distributed but in small numbers. Map 1.2 shows *B. barbastellus*' historical extent of occurrence (1900-2006), which has been included to provide contextual information. A comparison between current and historic range suggests a 17% decline since the beginning of the 20<sup>th</sup> century (current = 80,939km<sup>2</sup>, historic = 97,916km<sup>2</sup>, using Alpha Hull software and assuming an alpha value of 45 km). However, the quality and quantity of data are not sufficient to know whether this represents a real change in range and does not affect the assessment of favourable reference range for this species.

**Map 1.2** Historic extent of occurrence and occupied 10-km squares (1900-2006)



The rationale for including all records in the historic range estimate, and not only those obtained prior to 1990, is that we have assumed a decline over time for this species was more likely than an increase and that where the species occurs currently it would also have occurred historically, but historic recording was not comprehensive enough to provide sufficient information. Data prior to the 1900s has been excluded from the analysis of historic range, on the basis that it is unlikely to be numerous or reliable. Historic range has been calculated from the total of the data accumulated over the longer period, is not adjusted for natural fluctuations in range, and could exceed the maximum actual range occupied by the species at any given time during that period.

## 1.8 Range conclusion<sup>2.8</sup>

### Favourable

The current range is equal to the favourable reference range and is considered large enough for the long-term survival of the species. This combination of factors makes the range

assessment Favourable. At present there is no information on current trends in range to assess whether the situation is improving or deteriorating.

## **2. Population of the species<sup>2.4</sup>**

### **2.1 Population estimate<sup>2.4.1</sup>**

#### **5000 individuals**

4,500 in England, none in Scotland and 500 in Wales (Harris *et. al.* 1995)

### **2.2 Date of population estimate<sup>2.4.2</sup>**

**1995**

### **2.3 Method of population estimate<sup>2.4.3</sup>**

#### **1 = based on expert opinion**

The population estimate quoted was based on subjective estimates of relative abundance because there were few density estimates and a paucity of quantified data on bat numbers in relation to habitat associations and patterns of land use.

### **2.4 Quality of population data<sup>2.4.4</sup>**

#### **Poor**

The above estimate was a judgement based on field experience and not supported by quantitative data. Therefore, the estimate was given a reliability rating of five, “species for which there was so little information on its distribution and/or abundance in different habitat types, and for which the data were so inadequate or biased, that it was not possible to scale its abundance relative to other species reliably. For these species the estimate was believed on subjective criteria to be within the right order of magnitude, but no greater degree of accuracy was thought to have been achieved.” (Harris *et. al.* 1995). For this reason quality of data has been assessed as ‘Poor’.

### **2.5 Population trend<sup>2.4.5</sup> & Population trend magnitude<sup>2.4.6</sup>**

#### **Unknown**

There are no surveillance data for this species to enable assessment of population trends since 1994.

The best available historic information suggests the species was widely distributed, but in small numbers in southern England and parts of Wales at the beginning of the 20th century. The number of records for this species declined after a peak in the 1950s and 1960s, suggesting a pre 1994 population decline (Harris *et al.* 1995). However, there is not sufficient evidence to make an assessment.

### **2.6 Population trend period<sup>2.4.7</sup>**

**1994 – 2006**

### **2.7 Reasons for reported trend in population<sup>2.4.8</sup>**

#### **Not applicable**

More data are required to confirm status and trends for this species.

## **2.8 Justification of % thresholds for trends<sup>2.4.9</sup>**

### **Not applicable**

Trends are not described and so there is no requirement for a justification of percentage thresholds.

## **2.9 Main pressures<sup>2.4.10</sup>**

**110 Use of pesticides**

**151 Removal of hedges and copses**

**160 General Forestry management**

**164 Forestry clearance**

**165 Removal of undergrowth**

**166 Removal of dead and dying trees**

**400 Urbanised areas, human habitation**

**800 Landfill, land reclamation and drying out, general**

**803 infilling of ditches, dykes, ponds, pools, marshes or pits**

**810 Drainage**

## **2.10 Threats<sup>2.4.11</sup>**

**110 Use of pesticides**

**151 Removal of hedges and copses**

**160 General Forestry management**

**164 Forestry clearance**

**165 Removal of undergrowth**

**166 Removal of dead and dying trees**

**400 Urbanised areas, human habitation**

**800 Landfill, land reclamation and drying out, general**

**803 infilling of ditches, dykes, ponds, pools, marshes or pits**

**810 Drainage**

Evidence suggests that moths, the favoured food source at certain times of year, have undergone declines (Fox *et al.* 2006).

## **2.11 Favourable reference population<sup>2.7.2</sup>**

### **Unknown**

The favourable reference population value has been derived using 1994 as the baseline and making a judgement on whether the population in 1994 was viable in the long-term, using the decision tree in Note 1 (see 'Assessing Conservation Status: UK Approach') as a guide. Historic and current information on population size, distribution and trends have been used in order to assess viability and, if the 1994 level was not viable, then consideration has been given to what would constitute a viable population.

There was very little evidence with which to assess viability in 1994. There is some evidence that *B. barbastellus* abundance has undergone historic declines, but there are no current trend data to say whether that trend has continued since 1994. The estimated population size is relatively small compared with other bat species that occupy a similar range and it is possible that the 1994 population was not viable in the long-term. However, more data are required to assess population trends and absolute abundance.

## **2.12 Population conclusion<sup>2.8</sup>**

### **Unknown**

There have been no surveys carried out to assess the abundance and distribution of this species and information is largely based on ad hoc recording. There is also no surveillance scheme assessing population trends at present. The current population may be below a favourable reference value, but more robust data are required to confirm this.

## **3. Habitat for the species in the Biogeographic region or sea<sup>2.5</sup>**

*B. barbastellus* requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Boye & Dietz (2005) provides a good overview of this species' habitat requirements.

Foraging areas are predominantly in woodlands or parks, but they can also stretch along forest edges, tree rows, hedges, waterways, or field roads with trees. The home range extends up to 8-10 km around the roost.

Most summer roosts are found in narrow crevices in trees or buildings, but the preferred natural roost sites seem to be behind loose bark. Sometimes woodpecker holes are used and the species is frequently found behind window shutters or wall cover (shingles from wood or slate) on houses. On rare occasions the species is observed in bat boxes. During spring and summer, roost sites are changed frequently, sometimes every day, so that the group composition varies continuously.

Winter roosts are known in caves, old mines and bunkers. Most of the population probably hibernates in tree crevices and walls of houses. Summer and winter roosts seem to be a maximum of 20 km apart.

### **3.1 Surface area of habitat<sup>2.5.2</sup>**

#### **Unknown**

Detailed information is available on the habitat requirements/limitations of this species. Although there is some information on the roosting and foraging requirements for this species, it is not possible to quantify the habitat required for a population to be at favourable conservation status, nor to state whether that area or quality of habitat is available within the range of the species in the UK. Only approximately 8% of England and Wales is currently covered by broadleaved woodland (Haines-Young *et al.* 2000), the most important habitat for this species. However, to obtain an estimate of habitat used by the species, it would be necessary to first identify all of the foraging and roosting habitat located within the current range boundary; determine whether or not each of these features were being used; and subsequently calculate the combined area of all currently used habitats. This process would require very detailed habitat information at a fine scale across the UK. We do not currently have this level of information.

### **3.2 Date of estimation<sup>2.5.3</sup>**

**2006**

### **3.3 Quality of data on habitat area<sup>2.5.4</sup>**

**Poor**

Detailed information is available on the habitat requirements/limitations of this species. However, the area of habitat/suitable habitat is unknown as the species depends on a matrix of habitats in a landscape.

### **3.4 Habitat trend<sup>2.5.5</sup>**

#### **Unknown**

There is very limited information on changes in amount and quality of foraging and roosting habitats suitable for this species. Indications are that broadleaved, mixed and yew woodland have increased by about 4% in England and Wales since 1990 and there has been a small increase in tree lines and hedgerows, and some loss of pasture (Haines-Young *et al.* 2000). This is very limited information on which to base an assessment of trend in habitat suitable for this particular species. The assessment is, therefore, Unknown.

### **3.5 Habitat trend period<sup>2.5.6</sup>**

#### **1990 – 1998**

The time period selected reflects the results of two Countryside Surveys carried out in 1990 and 1998 (Haines-Young *et al.* 2000).

### **3.6 Reasons for reported trend in habitat<sup>2.5.7</sup>**

#### **3 = Direct human influence (restoration, deterioration, destruction)**

Deforestation and hard development.

### **3.7 Suitable habitat for the species (in km<sup>2</sup>)<sup>2.73</sup>**

#### **Unknown**

Since the current area of habitat is unknown, it would be inappropriate to try and estimate an area of 'suitable habitat'.

### **3.8 Habitat conclusion<sup>2.8</sup>**

#### **Unknown**

There is insufficient information to make a robust assessment on the habitat status for this species. The conclusion is, therefore, Unknown at the present time.

## **4. Future Prospects<sup>2.6</sup>**

#### **Unknown**

Insufficient information to make a judgement at present.

Factors likely to affect the species over the next 12-15 years are considered below.

**Legislation.** This species is listed on Schedules 5 & 6 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 and is listed on Annexes IIa and IVa of the Habitats Directive.

**Conservation action.** The species is the subject of a Species Action Plan under the UK Biodiversity Action Plan. Some of the known hibernation sites have been protected by grilling, and several are within Sites of Special Scientific Interest (SSSIs). There are 14 Special Areas of Conservation (SAC) where the species is recorded, with seven of those designated as SACs for this species and two others where the species is a feature of interest.

The UK National Bat Monitoring Programme (NBMP) has developed and piloted a survey protocol on woodland SAC sites, establishing that *B. barbastellus* can be monitored using ultrasonic detectors (BCT 2004). In 2005, the pilot was repeated, modified, and expanded to encompass 12 sites including several where the species was not known to occur. There are now aims to establish baseline data for the species and to propose a long-term monitoring protocol (BCT 2006).

**Threats.** Low population density and slow population growth are likely to have made this species particularly vulnerable to factors such as loss and fragmentation of ancient deciduous woodland habitat; the loss, destruction and disturbance of roosts in buildings, trees and underground sites; and the reduction in numbers of insect prey, due to habitat simplification and factors such as fertiliser use and intensive grazing. The availability of dead and dying trees as roost sites and the lack of wetland for foraging are still major factors likely to affect the species status.

#### 4.1 Future prospects conclusion<sup>2,8</sup>

##### Unknown

Although there is information on legislative protection and conservation action for this species, there is very little information on whether the action has been effective. The NBMP should be able to address this in future years by providing trend information, but at present there is insufficient information on this species to make an assessment of future prospects. The conclusion is, therefore, Unknown.

### 5. Overall Assessment<sup>2,8</sup>

##### Unknown

Range for this species is considered favourable at this stage, but population, habitat and future prospects are unknown because of paucity of detailed research information. The overall assessment is therefore Unknown.

**Table 5.1.** Summary of conclusions

| Parameter                 | Judgement  | Grounds for Judgement (in accordance with Annex C)       | Reliability* |
|---------------------------|------------|--|--------------|
| <b>Range</b>              | Favourable | Range is not smaller than the favourable reference range | 3            |
| <b>Population</b>         | Unknown    | No or insufficient reliable information available        | N/A          |
| <b>Habitat</b>            | Unknown    | No or insufficient reliable information available        | N/A          |
| <b>Future Prospects</b>   | Unknown    | No or insufficient reliable information available        | N/A          |
| <b>Overall Assessment</b> | Unknown    | Two or more Unknown combined with Favourable             | N/A          |

\*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

BAT CONSERVATION TRUST. 2005. *The National Bat Monitoring Programme Annual Report 2004*. Available to download from Bat Conservation Trust website ([www.bats.org.uk](http://www.bats.org.uk)) and Tracking Mammals Partnership website ([www.trackingmammals.org](http://www.trackingmammals.org)).

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### Data Map Sources

Biological Records Centre - Mammals Database 100 m; Natural England - Batsites inventory for Britain (via the National Biodiversity Network (NBN) Gateway).

Bat Conservation Trust - National Bat Monitoring Programme Hibernation Survey (1997-2005).

Bat Conservation Trust - Distribution atlas of bats in Britain and Ireland 1980-1999. GB data only.