

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 :  
**S1312: *Nyctalus noctula* - Noctule**

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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## S1312 *Nyctalus noctula* Noctule

*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').

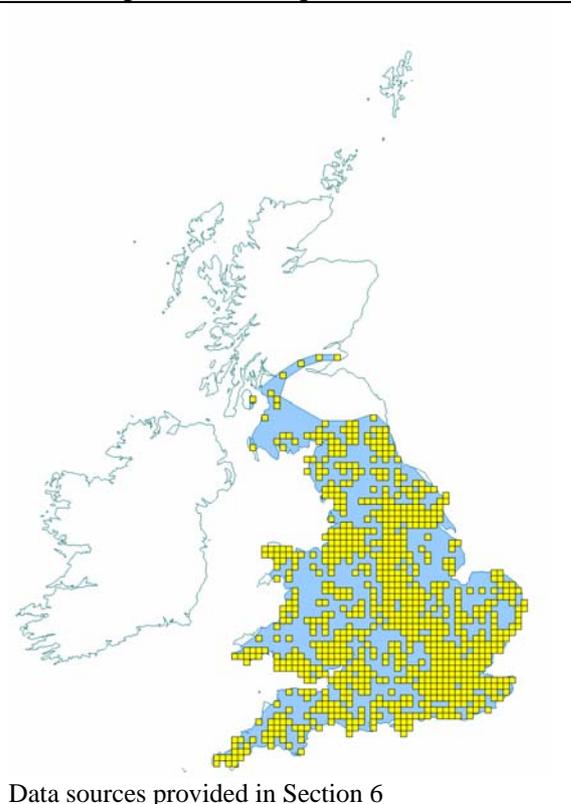
### 1. Range Information<sup>2,3</sup>

*Nyctalus noctula* is relatively common in England, Wales and southern Scotland, but absent from Northern Ireland.

#### 1.1 Surface area of range<sup>2,3,1</sup> 158,299km<sup>2</sup>

The above 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 data set is not known, making it impossible to divide the data into different date ranges. Deviating from this time period would mean having to exclude these records, and since other data sets 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>**

#### **Moderate**

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 have been no structured distribution surveys for this species and records are based on ad-hoc recording in the field, bat roost visits following enquiries to the statutory nature conservation agencies (SNCOs) and data from surveillance schemes. This species is not often encountered in dwelling houses and the level of recording is likely to be lower than for more synanthropic species.

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

#### **Stable**

There is no information on trends in range for this species during the selected time period 1980-2006. However, range does not appear to have changed since historic times (see 1.7) suggesting range has been stable during the selected period and since 1994.

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

#### **1980 – 2006**

The time period selected is considered to reflect the current situation regarding range change for this species and incorporates the time period since the Habitats Directive came into force.

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

#### **Not applicable**

There has been no change in range for this species according to available data.

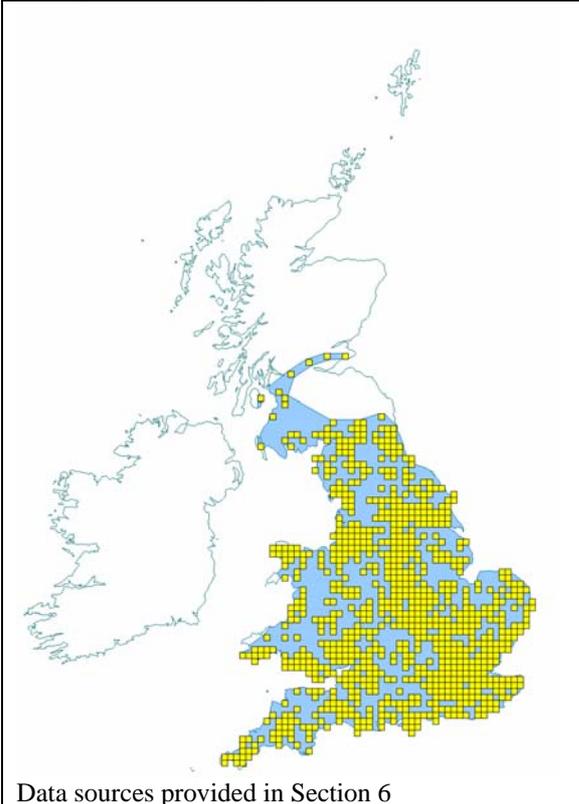
### **1.7 Favourable reference range<sup>2.7.1</sup>**

#### **158,299km<sup>2</sup>**

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.

Range of this species is widespread across England and Wales and into southern Scotland. Range appears to be stable with very little difference between current and historic area (calculated at 158,629km<sup>2</sup> using Alpha Hull software and an alpha value of 45 km. See Map 1.2) and is of sufficient size to support a viable population of the species in the long-term. It is also large enough to allow for increase in distribution within the range. The current estimated range is, therefore, set as the favourable reference range.

**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 1980, 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 for 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 range of *N. noctula* is stable and is the same as the favourable reference range. For these reasons, the conclusion is Favourable.

## 2. Population of the Species<sup>2.4</sup>

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

#### 50,000 individuals

45,000 in England; 250 in Scotland; and 4,750 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>**

### **2 - Extrapolation from surveys of part of the population**

The population estimates produced for the UK were based on estimating the ratio of abundance of *N. noctula* relative to other species in surveys organised by local Bat Groups and in samples submitted for rabies testing (Harris *et al.* 1995).

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

### **Poor**

The above estimate was not fully supported by quantitative data and was a judgement based on field experience. Harris *et al.*'s reliability rating of the above estimate was 3, meaning that "the population estimate was based on a limited amount of data on population densities in different habitat types, or for which the population estimate was obtained by scaling abundance relative to a species for which there was a reasonable population estimate." For this reason quality of data has been assessed as Poor.

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

### **Stable (+7%, but not significant)**

Trend analysis of the UK National Bat Monitoring Programme (NBMP) Field Survey undertaken between 1998 and 2005 (BCT 2006) indicated no significant trend across the UK (1% increase annually, overall 7%, but not significant). This would suggest that the population has been stable over this period. However, the time series dataset and the sample sizes for the survey are quite small and longer datasets are required to provide robust trend information.

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

### **1998 – 2005**

This time period has been selected because it allows consideration of the most recent trend data from surveillance schemes and is most relevant for assessing the effectiveness of the Habitats Directive.

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

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

Requirements of this species are largely unknown, but it has probably been subject to the same pressures as other bat species, i.e. the loss of roost sites, foraging habitats and insect prey (Battersby & TMP 2005). However, at present the best evidence available suggests the population is stable.

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

The 1% annual increase recorded here is not significant because of small sample sizes and wide confidence limits and is, therefore, not reported as an increase even though it is the same as the 1% threshold. For this reason the trend is considered currently stable.

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

### **101 Modification of cultivation practices**

### **110 Use of pesticides**

### **141 Abandonment of pastoral systems**

### **151 Removal of hedges and copses**

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- 160 General Forestry management**
- 164 Forestry clearance**
- 166 Removal of dead and dying trees**
- 167 Exploitation without replanting**
- 701 Water pollution**
- 803 Infilling of ditches, dykes, ponds, pools, marshes or pits**

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

- 101 Modification of cultivation practices**
- 110 Use of pesticides**
- 141 Abandonment of pastoral systems**
- 151 Removal of hedges and copses**
- 160 General forestry management**
- 164 Forestry clearance**
- 166 Removal of dead and dying trees**
- 167 Exploitation without replanting**
- 701 Water pollution**
- 803 Infilling of ditches, dykes, ponds, pools, marshes or pits**

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

### **50,000 individuals (Equal to 1995 estimate)**

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.

This species is widespread across England and Wales and southern Scotland. Although the abundance of the species is lower than other bat species with widespread distributions (*M. daubentonii*, *P. pipistrellus*, *P. pygmaeus*, *P. auritus* etc.), it is still considered to be sufficiently large to be viable in the long-term. Population trends for this species appear to be currently stable, although the assessment is based on a small sample of short duration (8 years). The 1995 population estimate has, therefore, been set as the favourable reference population. This figure has been set with limited information and could be revised in the future if better information becomes available. The more recent use of bat detectors has made recording of the species much easier because of its very distinctive echolocation.

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

### **Favourable**

The current population is apparently stable, and is the same as the favourable reference value. The population assessment is, therefore, Favourable.

## **3. Habitat for the Species in the Biogeographic Region or Sea<sup>2.5</sup>**

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

Foraging areas may be in several parts of the landscape, all of which host a high abundance of insect fauna and offer the space in the air needed by the fast flying *N. noctula*. Large water bodies, valley pastures and open forests are preferred, but the bats also forage in other habitats, and even above harvested fields and urban street lights. *N. noctula* bats can easily make foraging flights more than 10 kilometres away from the roost site, up to a maximum of 20 kilometres. However, the main activity of a maternity colony is within a radius of about 2 kilometres from the colony's roost.

Summer roosts are predominantly in woodlands and parks. Deciduous and flood forests with a high percentage of old and dead trees are of highest importance. Roosts are mostly in woodpecker holes in broad-leaved trees. Maternity colonies use several roost sites in a network, which means that the individuals often change from one roost to another. Associations of males, which change their roost site on average every second or third day, need at least eight tree holes suitable for roosting per square kilometre of forest. Besides tree holes the bats also roost in bat boxes (flat constructions are preferred) and small spaces behind wall coverings of buildings or in houses.

Winter roosts are mainly in forest and park trees, but large hibernation colonies also roost in buildings or rock crevices. Tree holes must provide a lot of space for a large number of bats to be a good hibernaculum for the species.

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

#### **Unknown**

In order to obtain this estimate, 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. Therefore area estimate is Unknown.

### **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**

There is some information pertaining to specific habitat requirements for this species (as can be seen above). However, attempts have not been made to calculate the combined area of habitat features that are currently in use.

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

#### **Unknown**

*N. noctula* is a tree-dwelling species, often roosting in large colonies in the hollow trunks or branches of old or dead trees. The loss of suitable roost sites through woodland management is therefore a particular problem. Approximately 12% of the UK is currently covered by woodland (Haines-Young *et al.* 2000), but only 6% is broadleaved, mixed and yew woodland, the most suitable roosting habitat for this species. And although this habitat has increased by about 5% in the UK since 1990, it is still at relatively low levels. There has also been a small increase in tree lines and hedgerows, and some loss of pasture since 1990 (Haines-Young *et al.* 2000).

This species forages over riparian habitat and may have been affected historically by drainage of wetlands and loss of ponds and ditches. River and riparian habitat suffered degradation in the UK during the 20<sup>th</sup> century. However, there is evidence to suggest that these trends are now in reverse. Riparian habitats and water courses have been assessed in the two most recent Countryside Surveys, in 1990 and 1998 (Haines Young *et al.* 2000) and a comparison of results showed that the biological condition of 25% of streams and small rivers improved in Great Britain during this period. Fen, marsh and swamp expanded by 27% in England and Wales and by 19% in Scotland, but declined by 19% in Northern Ireland. The total area of inland water bodies has not changed, but there has been an increase in the number of small inland water bodies, by 6%, which reverses the losses observed in the 1980s.

Overall the loss of wetland areas in the 1980s appears to have stabilised with some return to pre 1980 figures. Water quality has improved during the trend period. However, this is still 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>**

**Not applicable**

### **3.7 Suitable habitat for the species (in km<sup>2</sup>)<sup>2.7.3</sup>**

#### **Unknown**

Since current area of habitat is unknown, it would be inappropriate to suggest an area of suitable habitat.

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

#### **Unknown**

The habitat requirements for this species have been studied, but there has been no attempt to correlate population density with suitable habitat availability. The low percentage of woodland cover across the UK means that the area of habitat available for this species is relatively small. Recent improvements in woodland extent in all countries suggest that the situation is improving, but the very specific roosting requirements of this species mean that newly planted woodland may not provide sufficient roost sites. Area and quality of wetland habitat is also improving. The assessment is, therefore, Unknown at present.

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

#### **Unknown**

No or insufficient reliable information available.

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

**Legislation** *N. noctula* 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 Annex IVa of the Habitats Directive.

**Conservation action.** Range and population status appear to be Favourable at present and there are habitat action plans in place to relieve many of the main pressures and threats to the species, such as loss of woodland and riparian habitat. The species is also being considered as a priority species.

**Threats.** The availability of dead and dying trees as roost sites and the lack of wetland for foraging are major factors likely to continue to affect this species status.

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

##### Unknown

There is very little information for this species to be able to assess future prospects. Range and population appear to be Favourable at present, but there is very little information to make a robust assessment of future threats. The conclusion is, therefore, Unknown at present.

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

##### Unknown

Range and population conclusions are Favourable, but habitat and future prospects are Unknown. The overall assessment is, therefore, Unknown at present.

**Table 5.1** Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Range is stable and not smaller than the favourable reference range	2
Population	Favourable	Population(s) not lower than favourable reference population	2
Habitat	Unknown	No or insufficient reliable information available	N/A
Future Prospects	Unknown	No or insufficient reliable information available	N/A
Overall Assessment	Unknown	Two or more Unknown combined with Favourable or all Unknown	2

\*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

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BAT CONSERVATION TRUST. 2006. *The National Bat Monitoring Programme Annual Report 2005*. 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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### Map Data Sources

BATS & The Millennium Link - Bat species distribution in Central Belt of Scotland (2000 to 2005); Biological Records Centre - Mammals Database 100m; Environment and Heritage Service - Species Dataset; Highland Biological Recording Group Mammals dataset; Natural England - Batsites inventory for Britain; via NBN Gateway

Scottish Natural Heritage bat records: update, J. Haddow (pers. comm)

Bat Conservation Trust National Bat Monitoring Programme NSP Field Survey (1998-2005)

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