

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 :  
**S1330: *Myotis mystacinus* - Whiskered bat**

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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## S1330 *Myotis mystacinus* Whiskered bat

*Audit trail compiled and edited by JNCC and the UK 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>

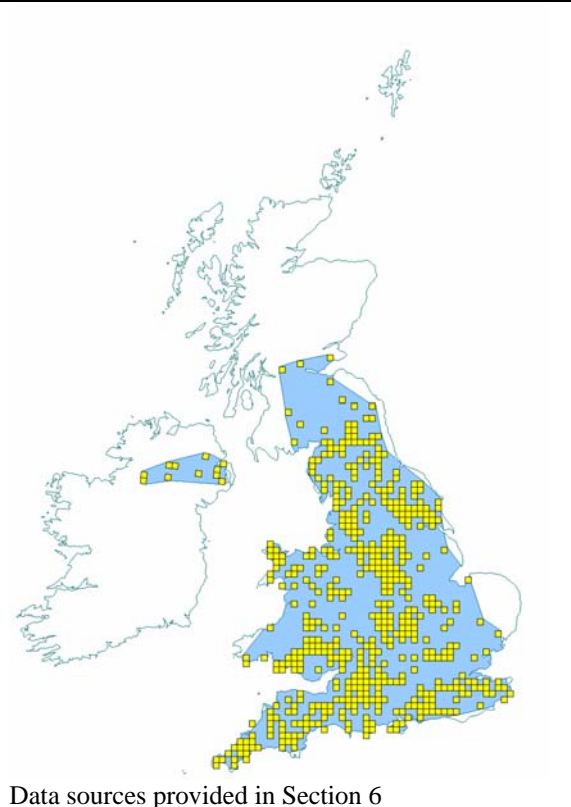
*Myotis mystacinus* is found throughout the UK, as far north as southern Scotland. It has a patchy distribution, and seems to be rarely encountered in some well surveyed areas, such as Norfolk, Suffolk and Essex (Richardson 2000).

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

**157,982km<sup>2</sup>**

The above estimate was calculated within Alpha Hull software, using extent of occurrence (as a proxy measure for range (as shown in Map 1.1). The value of alpha was set at 45 km to reflect the mobility of this species. Occasional records of vagrants that were clearly outside the species range were excluded from the calculation.

**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. 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 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. Furthermore, this species was not distinguished from Brandt's bat until 1970 (Harris *et al.* 1995), and many records do not separate the two species. Therefore, there is still relatively little information on its distribution, and trend analysis is constrained by historic under-recording. The quality of data is therefore considered to be poor.

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

**Stable**

No surveys have been carried out to assess change in distribution or range for this species since 1994. However, there is no evidence to suggest the range is declining.

## **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. Historic information is provided to set the current situation in a historic context.

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

**Not applicable**

The 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 & Tracking Mammals Partnership (TMP) 2005).

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

**157,982km<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.

The first record for *M. mystacinus/Myotis brandtii* was in 1935 and with very few historic records it is difficult to make a proper assessment of species status with regard to range change. However, there has been no apparent change in the range for this species during the time period considered and it is likely that the current estimated range is the same as it was in 1994. The current range is probably 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.

The current estimated range is, therefore, set as the favourable reference range. Improved recording and identification methods should help to differentiate between *M. brandtii* and *M. mystacinus* and provide a more robust assessment of range in the future.

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

### **Favourable**

The range of *M. mystacinus* is stable and is the same as the favourable reference range. For these reasons, it is assessed as Favourable.

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

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

#### **64,000 individuals**

30,500 in England; 1,500 in Scotland; 8,000 in Wales (Harris *et al.* 1995) and 24,000 in Northern Ireland (Russ 1999).

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

#### **1999**

Reported in Battersby & TMP (2005).

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

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

The population estimates produced for Great Britain (GB) were based on subjective estimates of relative abundance because there were few density estimates and little quantified data on bat numbers in relation to habitat associations and patterns of land use (Harris *et al.* 1995). Population estimates for Northern Ireland were based on extrapolation of survey results (Russ 1999) and were added to the GB estimates to give UK totals.

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

#### **Poor**

The above estimate for GB was not supported by quantitative data and was a judgement based on a high level of field experience. Harris *et al.* (1995) gave the estimate a reliability rating of four, meaning that it is an "estimate based on a very limited amount of information on the species". The Northern Ireland estimate should also be treated with caution because it

is thought likely to be an overestimate (Battersby 2005). For these reasons the quality of data is assessed as Poor.

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

### **Stable**

(25% overall, but not statistically significant)

It is very difficult to separate this species from *M. brandtii* in hibernation sites, because they are morphologically very alike and positive identification would require disturbance of the bats. The UK National Bat Monitoring Programme Hibernation Survey considered *M. mystacinus* and *M. brandtii* together for the purpose of analysis. Using this approach, no significant changes have been identified for the two species since 1997 (BCT 2006). A 25% overall increase has been recorded, representing a 3.3% annual increase, but this is not statistically significant. This is only one surveillance scheme with very small sample sizes and caution should be used in applying the results with confidence to *M. mystacinus*, because the results could reflect the population status of *M. brandtii* (Battersby & TMP 2005).

During recent surveys of whiskered maternity colonies, some former roosts were identified as abandoned, and in many extant roosts, land owner observations suggested population decreases. This may be an indication of populations decline (Lene Berge *pers comm.*).

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

### **1997 – 2005**

In the absence of any robust historic information for this species, the trend period reflects currently available information from surveillance schemes.

## **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 3.3% 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 above the 1% threshold. For this reason the trend is considered currently stable.

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

- 110 Use of pesticides**
- 141 Abandonment of pastoral systems**
- 151 Removal of hedges and copses**
- 160 General Forestry management**
- 164 Forestry clearance**
- 165 Removal of undergrowth**
- 166 Removal of dead and dying trees**
- 167 Exploitation without replanting**
- 401 continuous urbanisation**
- 502 routes, autoroute**
- 624 mountaineering, rock climbing, speliology**

**701 water pollution**

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

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

**110 Use of pesticides**

**141 Abandonment of pastoral systems**

**151 Removal of hedges and copses**

**160 General Forestry management**

**164 Forestry clearance**

**165 Removal of undergrowth**

**166 Removal of dead and dying trees**

**401 continuous urbanisation**

**502 routes, autoroute**

**624 mountaineering, rock climbing, speliology**

**701 water pollution**

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

**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 is very little historic or current information to determine a favourable reference population for this species. The only information on current trends suggests stable populations at present, but the time series is very short and the data are not robust because of potential confusion with the closely related *M. brandtii*. More data are required to assess population trends and absolute abundance. For this reason the favourable reference population is unknown at present.

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

**Unknown**

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

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

*M. mystacinus* 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.

Wing morphology and echolocation calls indicate that *M. mystacinus* forage in edge or cluttered habitats (Norberg & Rayner 1987), in dense woodlands, park-like forests, along forest edges, banks, hedges and in gardens, often in close proximity to water (von Helversen *et al.* 2001). Maximum foraging distance is approximately 1,250 metres from the roost, but in most cases less than 700 metres. A minimum population density of about 1.5 individuals/ km<sup>2</sup> has been estimated in northern England, based on counts from maternity colonies (n=15)

(Jones *et al.* 1996). The species is negatively affected by increased forest patchiness (Johansson & de Jong 1996).

Summer roosts are mostly in buildings, in crevices and holes in buildings, more rarely in trees, in tree holes, and behind loose bark. In many cases the entrance to a roost is a very small opening. Bird or bat boxes are used by single individuals or as mating roosts, and only occasionally are boxes used by a maternity colony. In northern England, the mean size of maternity roosts was found to be 23.3 individuals (Jones *et al.* 1996).

Caves, mines and cellars are used for hibernation. In most underground hibernation sites other bat species are also present, especially of the genus *Myotis* and *Plecotus*.

The species can be found swarming at underground sites from August until October. The purpose is not fully understood, with mating or information transfer as possible explanations (Parsons *et al.* 2003).

### **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**

Although information is available on whiskered bat habitat requirements, 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**

We do not know enough about the habitat requirements of this species to assess trend in habitat extent and quality. Indications are that broadleaved, mixed and yew woodland have increased by about 5% in the UK since 1990 and there has been a small increase in tree lines and hedgerows, and some loss of pasture (Haines-Young *et al.* 2000). However, this is very limited information on which to base an assessment of trend in suitable habitat. 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**

The trend of suitable habitat for this species during the time period considered is unknown and it is not appropriate to consider reasons for an unknown trend.

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

#### **Unknown**

Current area of habitat used by this species is unknown and it is not possible to suggest an area of 'suitable habitat' to support a favourable population.

### **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. There is evidence of recent improvements in habitat extent, but the information available is very limited. The conclusion is, therefore, Unknown at present. This judgement will need to be reviewed in the future depending on availability of information on habitat use and extent.

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

#### **Unknown**

This species is offered full protection under national and European legislation. However, the lack of information on distribution, abundance and habitat requirements and the inability at present to detect population trends separately from those of *M. brandtii* means that it is difficult to plan conservation management action and to know if action planned for other species will be effective for this species. Roost sites are probably not a limiting factor, and being generalists, it is unlikely that diet is a limiting factor either. It is perhaps most important therefore to concentrate on the conservation of foraging habitats and swarming sites.

### **4.1 Future prospects conclusion<sup>2.8</sup>**

#### **Unknown**

There is insufficient information on this species to make an assessment of future prospects.

## **5. Overall Assessment<sup>2.8</sup>**

#### **Unknown**

Three out of four assessments for this species, population, habitat area and future prospects are unknown at present because of paucity of data. Range is the only assessment considered to be Favourable and the overall assessment is, therefore, Unknown.

**Table 5.1** Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Stable (loss and expansion in balance) or increasing <u>AND</u> not smaller than the favourable reference range	3
Population	Unknown	No or insufficient reliable information available	N/A
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	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. 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)).

BATTERSBY, J (Ed.) & TRACKING MAMMALS PARTNERSHIP. 2005. *UK Mammals: Species Status and Population Trends*. JNCC/Tracking Mammals Partnership.

BOYE, P. & DIETZ, M. 2005. *Research Report No 661: Development of good practice guidelines for woodland management for bats*. English Nature, Peterborough.

HAINES-YOUNG, R.H., BARR, C.J., BLACK, H.I.J., BRIGGS, D.J., BUNCE, R.G.H., CLARKE, R.T., COOPER, A., DAWSON, F.H., FIRBANK, L.G., FULLER, R.M., FURSE, M.T., GILLESPIE, M.K., HILL, R., HORNING, M., HOWARD, D.C., McCANN, T., MORECROFT, M.D., PETIT, S., SIER, A.R.J., SMART, S.M., SMITH, G.M., STOTT, A.P., STUART, R.C. & WATKINS, J.W. 2000. *Accounting for nature: assessing habitats in the UK countryside*. Countryside Survey 2000. DETR, HMSO, London.

HARRIS, S., MORRIS, P., WRAY, S. and YALDEN, D. 1995. *A review of British Mammals: population estimates and conservation status of British mammals other than cetaceans*. JNCC, Peterborough.

JOHANSSON, M. & DE JONG, J. 1996. Bat species diversity in a lake archipelago in central Sweden. *Biodiversity & Conservation*, **5**, 1221-1229.

JONES, K.E., ALTRINGHAM, J.D. & DEATON, R. 1996. Distribution and population densities of seven species of bat in northern England *Journal of Zoology*, **240**, 788-798

NORBERG, U.M. & RAYNER, J.M.V. 1987. Ecological morphology and flight in bats (Mammalia: Chiroptera): Wing adaptations, flight performance, foraging strategy and echolocation. *Philosophical Transactions of the Royal Society, London B*, **316**, 335-427.

RICHARDSON, P. 2000 *Distribution atlas of bats in Britain and Ireland 1980-1999*. Bat Conservation Trust, London.

RUSS, J.M. (1999). The Microchiroptera of Northern Ireland: community composition, habitat associations and ultrasound. Unpublished PhD thesis. Queen's University, Belfast.

VON HELEVERSON, O., HELLER, K.G., NEMETH, A., VOLLETH, M. & GOMBKOTO, P. 2001. Cryptic mammalian species: a new species of whiskered bat (*Myotis aclathoe* n sp) in Europe. *Naturwissenschaften* **88**: 5, 217 – 223

### **Map Data Sources**

Biological Records Centre - Mammals Database 100 m; Environment and Heritage Service - Species Dataset; Natural England - Batsites inventory for Britain; via National Biodiversity Network (NBN) Gateway.

Bat conservation Trust National Bat Monitoring Programme (NBMP) data to 2005 including: Hibernation Survey (1997-2005).

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