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 :

S1314: *Myotis daubentonii* - Daubenton's bat

S1314 *Myotis daubentonii* Daubenton's 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[2.3]

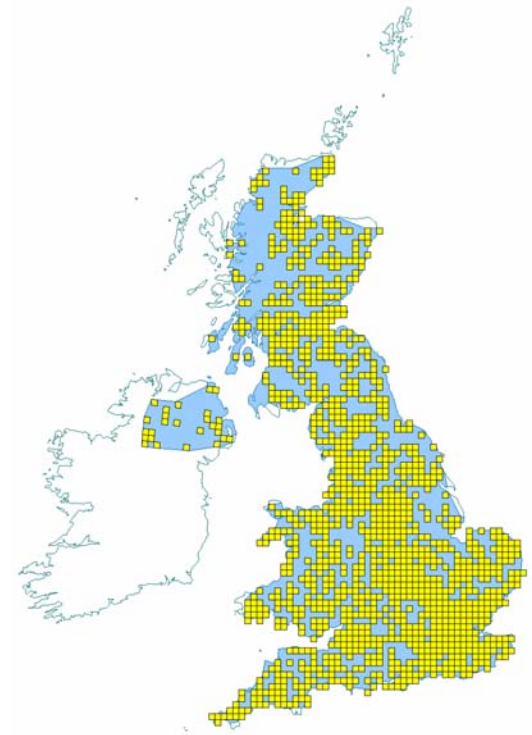
Myotis daubentonii is relatively widespread across the UK.

1.1 Surface area of range[2.3.1]

228,149km^2

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 below). 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)



Data sources provided in Section 6

1.2 Date of range determination[2.3.2]

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[2.3.3]

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[2.3.4] and range trend magnitude[2.3.5]

Stable

There have not been any surveys carried out to assess trends in distribution or range for this species. However, the species is widespread across the UK and there are no indications that the range has changed since the Habitats Directive came into force.

1.5 Range trend period [2.3.6]

1980 – 2006

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

1.6 Reasons for reported trend in range[2.3.7]

Not applicable

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

1.7 Favourable reference range[2.7.1]

228,149km^2 (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.

This species is widespread across the UK. The favourable reference range is set to be equivalent to all of the UK, excluding the Scottish offshore islands, where the species does not occur. The favourable reference range/current estimated range may not correspond exactly with UK total area, but this is due to an artefact of the alpha mapping tool and the fact that there has been no comprehensive distribution survey to complete the recording information. Expert opinion considers this species to occur throughout the UK.

1.8 Range conclusion[2.8]

Favourable

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

2. Population of the Species[2.4]

2.1 Population estimate[2.4.1]

560,000 individuals

95,000 in England; 40,000 in Scotland; 15,000 in Wales (Harris *et al*. 1995); and 410,000 in Northern Ireland (Russ 1999).

2.2 Date of population estimate[2.4.2]

1999

2.3 Method of population estimate[2.4.3]

1 = Based on expert opinion

The estimates were based on expert judgement and extrapolation from limited field surveys. The 1995 population estimate for Great Britain (GB) was based on very limited information, extrapolating from known size of *Pipistrellus pipistrellus* colonies in relation to size of *M. daubentonii* colonies following the methods described by Speakman (1991) and Harris *et al.* (1995). Population estimates for Northern Ireland were based on extrapolation of survey results and were added to the GB estimate to give UK totals (Russ 1999).

2.4 Quality of population data[2.4.4]

Poor

The population estimates 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. For this reason the quality of data is assessed as Poor.

The GB estimate was not supported by quantitative data and was an expert judgement based on field experience. Harris *et al's* (1995) reliability rating of the estimate was 4, meaning that it is "based on a very limited amount of information on the species". The Northern Ireland estimate should also be treated with caution because it could be an overestimate (Battersby & TMP 2005). Accurate estimates are not possible until more is known about the ecology of this species.

2.5 Population trend[2.4.5] and population trend magnitude[2.4.6]

+

The UK National Bat Monitoring Programme (NBMP) has been carrying out a standardised annual Field Survey for this species and a Hibernation Survey since 1997. The Daubenton's Waterway Survey, using randomly selected 1km square bat detector transects along waterways and waterbodies, has detected a significant upward trend of 20% since 1997, representing a mean annual increase of 2.9% across the UK. The Hibernation Survey has detected a significant upward trend of 25%, a mean annual increase of 3.3% (BCT 2006). The percentage increase in the population has not been incorporated into the current population estimate because of the levels of uncertainty in the population data.

2.6 Population trend period[2.4.7]

1997 – 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[2.4.8]

4. Indirect anthropo(zoo)genic influence

Aquatic insects provide a major source of food for *M. daubentonii*, and these have not declined to the same extent as terrestrial insects (which have suffered from extensive insecticide use) (REF). Excessive use of fertilisers and the resultant eutrophication of some waterbodies may have increased insect availability for this species (Harris *et al.* 1995; Warren *et al*. 2000). If population increases are substantiated, it may be that this is a strong contributing factor.

2.8 Justification of % thresholds for trends[2.4.9]

Not applicable

The recent increase of 2.9%-3.3% annually since 1997 is greater than the specified threshold and no justification is required.

2.9 Main pressures[2.4.10]

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
502 Routes, autoroutes
624 Mountaineering, rock climbing, speliology
700 Pollution
803 Infilling of ditches, dykes, ponds, pools, marshes or pits

2.10 Threats[2.4.11]

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
502 Routes, autoroutes
624 Mountaineering, rock climbing, speliology
700 Pollution
803 Infilling of ditches, dykes, ponds, pools, marshes or pits

2.11 Favourable reference population[2.7.2]

150,000 individuals (Equal to the 1995 GB 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.

Survey schemes have been detecting increasing trends since 1997, which are not considered to be the result of natural fluctuations. The GB population for this species in 1995 was estimated to be 150,000 individuals (see section 2.3). With increasing trends, widespread distribution and relatively high abundance, the species is judged to have been viable in 1994. The 1994 estimate has, therefore, been set as the favourable reference population. This figure does not include the more recent estimate for the Northern Ireland population and has been set with limited information. It could be revised in the future if better information becomes available.

2.12 Population conclusion[2.8]

Favourable

Populations of this species have been increasing since at least 1997, as measured by the NBMP and the current population is likely to be above the favourable reference population. The population is, therefore, considered to be Favourable.

3. Habitat for the Species in the Biogeographic Region or Sea[2.5]

M. daubentonii 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 at open water bodies and slow flowing rivers. *M. daubentonii* prefers water bodies, rivers and streams with trees or bushes on the banks to provide shelter from wind. Foraging success is also influenced by the amount of weed cover on the water surface. Sometimes, mainly in springtime, the bats also forage away from water, e.g. woodland clearings. The use of particular foraging areas generally follows the abundance of Nematocera and Ephemeroptera. When riparian insect abundance is reduced due to windy weather or cold temperatures, *M. daubentonii* preferentially forages in woodlands. In oak forests individual home ranges were identified with an average size of about 49 hectares. The species can cover distances of 7-8 kms between roosting and foraging areas without difficulty.

Woodlands are most important as roost sites, especially if they are close to water bodies. Summer roosts are predominantly in trees, sometimes in wall crevices in buildings or underneath bridges. Preferred roosts are in old woodpecker holes, which become enlarged upwards by rotting within a living tree. Fissures in stems, wood crevices, hollow branches, and bird or bat boxes are also used. Most roosts are found in or near the trunk of a broadleaf tree at a height of 1 to 25 metres above the ground with a trunk diameter of at least 30 centimetres. Roost trees are often situated near the forest edge, with more than 40% within 30 metres of the edge. Most males roost alone, and in May and June they also use underground roost sites. Summer roosts are changed frequently. Maternity colonies switch among a network of several roost sites. Winter roosts include caves, mines, cellars and other underground habitats.

3.1 Surface area of habitat[2.5.2]

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[2.5.3]

2006

3.3 Quality of data on habitat area[2.5.4]

Poor

Much work has been done on this species and there is a good information pertaining to its specific habitat requirements (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[2.5.5]

Unknown

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).

This species forages preferentially over riparian habitat and may have been affected historically by drainage of wetlands and loss of ponds and ditches. 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[2.5.6]

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[2.5.7]

Not applicable

The trend 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^2)[2.7.3]

Unknown

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

3.8 Habitat conclusion[2.8]

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 historic loss of suitable habitat for this species, but also evidence of recent improvements, making it difficult to be sure of the situation regarding habitat extent and quality. The assessment is, therefore, Unknown at present.

4. Future Prospects[2.6]

Good prospects

The species is expected to survive and prosper.
Factors likely to affect the species over the next 12-15 years are considered below.

Legislation *M. daubentonii* is listed on Schedules 5 & 6 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 (and equivalent legislation in Northern Ireland) and is listed on Annex IVa of the Habitats Directive.

Conservation action. Range and population appear to be Favourable at present and there are habitat action plans and legislation 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 very generalist in the prey items it takes and forages in many different types of habitat. There has been a general trend towards improved water quality across the UK and as long as this continues then prospects are good.

Threats. Maintaining sufficient vegetation cover along water body and river edges is an important factor that will affect prospects for this species.

4.1 Future prospects conclusion[2.8]

Favourable

Although there are undoubtedly continuing threats to this species, the main pressures and threats are not significant enough to affect the long-term viability.

5. Overall Assessment[2.8]

Favourable

Range, population and future prospects are all Favourable for this species and the habitat assessment is Unknown at present and requires further consideration. The overall conclusion is, therefore, Favourable.

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	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	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

BAT CONSERVATION TRUST. 2006. *The National Bat Monitoring Programme Annual Report 2005*. Available to download from Bat Conservation Trust website (www.bats.org.uk) and Tracking Mammals Partnership website (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 Waterway Survey (1997-2005) Hibernation Survey (1997-2005)

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