

**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 :
S1341: *Muscardinus avellanarius* - Common
dormouse**

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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S1341 *Muscardinus avellanarius* Common dormouse

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}

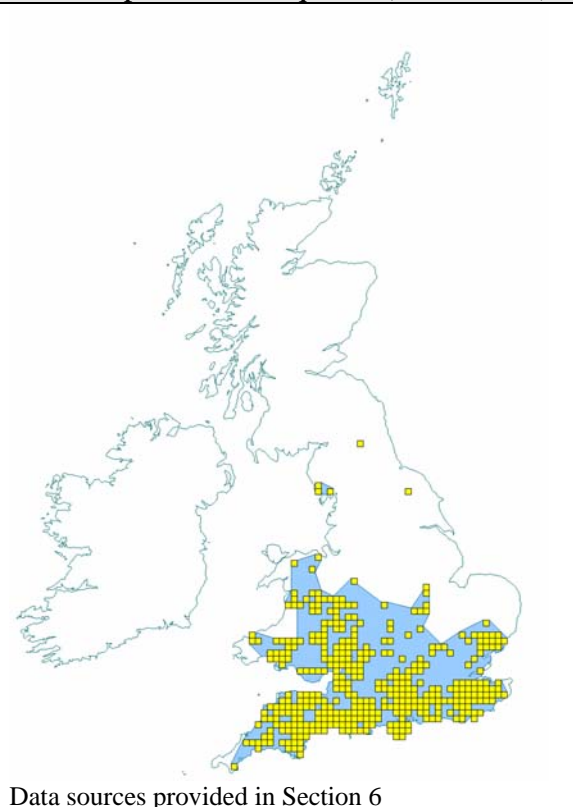
Muscardinus avellanarius is patchily distributed across Wales and the southern half of England. In northern Britain, they occur only in three isolated populations in Cumbria and Northumberland (Macdonald & Tattersall, 2001). Since 1992 *M. avellanarius* has been reintroduced to a number of sites in England. The species is absent from Scotland and Northern Ireland.

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

77,731km²

The above estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (see Map1.1). The value of alpha was set at 25 km to reflect the limited mobility of this species.

Map 1.1 Current extent of occurrence and occupied 10-km squares (1990 -2006)



1.2 Date of range determination^{2.3.2}

1990 – 2006

This species has been subject to a relatively high level of recording, making it possible to consider current range using only data collected since 1990.

1.3 Quality of range data^{2.3.3}

Moderate

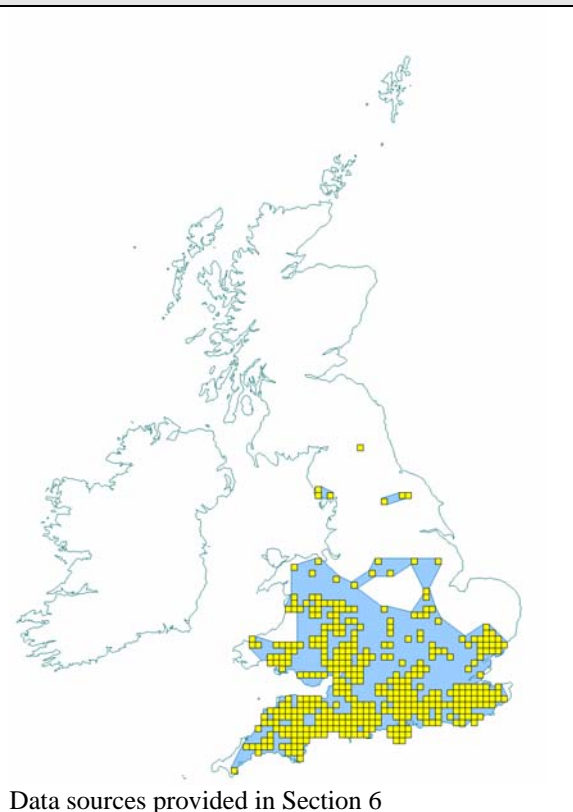
This species has been the subject of several national surveys to assess current distribution and is monitored annually in selected sites across the current range. It has not been the subject of a full inventory, but the quality of data can be described as moderate.

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

Stable

Evidence from distribution surveys carried out during the specified time period (see section 2.5) suggests that the range for this species has remained stable since 1994.

Map 1.2. Current extent of occurrence and occupied 10-km squares, including reintroduction sites



Over the last 100 years this species has declined in both numbers and distribution and *M. avellanarius* is often absent from apparently suitable areas, possibly as a consequence of past management. Since 1992, this species has been re-introduced into North Yorkshire, Cambridgeshire, Cheshire, Derbyshire, Suffolk, Warwickshire, Buckinghamshire and Nottinghamshire. However, reintroduction sites have been excluded for the purposes of range trend analysis because further work is required to assess if the populations have

become established. If reintroduced populations become established in all sites, then the current range estimate would increase to 86,277km².

1.5 Range trend period^{2.3.6}

1990 – 2006

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

1.6 Reasons for reported trend in range^{2.3.7}

3. Direct human influence (restoration, deterioration, destruction);

4. Indirect anthropo(zoo)genic influence

Range is stable at present, probably as a result of conservation management and legal protection under wildlife legislation, such as the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c) Regulations 1994, and should increase if reintroduced populations become established.

1.7 Favourable reference range^{2.7.1}

77,731km² (Equal to current estimate)

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 range for this species appears to have been stable since 1994 and is sufficiently large to support a long-term viable population. Furthermore, there are efforts to increase the range through reintroductions and the apparent success of some of the reintroductions and the persistence of populations in Cumbria and Northumberland suggests that the range may be increasing. The current range is, therefore, set as the favourable reference range.

1.8 Range conclusion^{2.8}

Favourable

Range for this species is stable at present and is equal to the favourable reference range. The conclusion is, therefore, Favourable.

2. Population of the Species^{2.4}

2.1 Population estimate^{2.4.1}

45,000 individuals

The total adult population has been estimated to be 45,000, distributed among a variety of widely fragmented sites. Population densities vary with habitat quality: 4-10 individuals/ha in optimal habitat; 2/ha in oak dominated woodland (more if the habitat is appropriately managed); and 1-3/ha in conifer woodland. There are now fewer than 10 known sites north of the line between Wirral and the Wash (Bright, Morris & Mitchell-Jones 2006).

2.2 Date of population estimate^{2.4.2}

2005

2.3 Method of population estimate^{2.4.3}

2 = Extrapolation from surveys of part of the population, sampling

Population size was estimated by extrapolation using data from the National Dormouse Monitoring Programme (NDMP). The NDMP was established in 1991 with the aim of monitoring changes in dormouse distribution using data from dormouse nest box schemes established throughout England and Wales. Each site has a minimum of 50 nest boxes which are checked monthly between May and October. Data collected include number of dormice in each box, body weight, sex and breeding condition.

2.4 Quality of population data^{2.4.4}

Moderate

It will always be difficult to provide good population estimates for small non-colonial mammals, but *M. avellanarius*' dependence on woodland means that we can measure the extent of habitat reasonably well and extrapolate from that.

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

– 13,500 individuals

There has been a national significant downward trend detected between 1993 and 2002. Trend analysis of data from the National Dormouse Monitoring Programme (NDMP), run by People's Trust for Endangered Species, shows that dormouse populations have declined in all landscapes, except areas of southern England, where populations appear to be stable. The overall decline is estimated to be 23% (Sanderson 2004), equivalent to a loss of 13,500 individuals using current population estimates. The greatest change has been observed at the edge of the species current range in Britain.

M. avellanarius declined in both distribution and abundance during the 20th century as a result of woodland loss and habitat fragmentation. Two surveys were carried out in England, in 1993 and 2001, to assess changes in dormouse distribution and to assess whether the species still survived in areas where it was known to occur in Victorian times. The results showed a clear decline in distribution compared with Victorian times, especially in northern England, but many of the sites searched in 1993 were still occupied in 2001.

Two surveys to assess *M. avellanarius* distribution in Wales were carried out between 1997 and 2000 by the Vincent Wildlife Trust (VWT) (Jermyn, Messenger & Birks 2001) and Countryside Council for Wales (Bright 2000). The VWT survey confirmed *M. avellanarius* presence in 53 10 km². When combined with records gathered from other sources, dormice were recorded in a total of 68 10km², a 70% increase since the previously published 1993 distribution map. However, this increase reflected improved recording rather than an increase in *M. avellanarius* distribution. From a sample of 50 sites with pre-1990 records only 68% were positive, indicating the species distribution was still declining in Wales (Jermyn, Messenger & Birks 2001).

2.6 Population trend period^{2.4.7}

1993 – 2002

This is the time period for which sufficient data are available in the NDMP (Sanderson 2004).

2.7 Reasons for reported trend in population^{2.4.8}

3. Direct human influence (restoration, deterioration, destruction);

4. Indirect anthropo(zoo)genic influence

Habitat loss and fragmentation and inappropriate management are thought to be the main factors causing decline.

Many areas of diverse ancient woodland have been felled and replaced by farmland, roads and urban development. Replanted woodlands have fewer tree and shrub species, and will have an even age structure. Furthermore, large areas of woodland have been progressively fragmented into smaller and smaller copses as a result of roads construction and development. These fragments often contain too few individuals to be considered viable populations, the remaining habitat is left in isolated blocks, often with no woodland or hedgerow connections that would allow the dispersal and exchange of animals between local populations.

Inappropriate habitat management has also been a problem. The decline of coppice management resulted in heavier shading, repression of re-growth and death of the understorey where dormice obtain most of their food. Browsing by deer and domestic stock also damages shrubs, depleting food supplies for *M. avellanarius* (Bright, Morris & Mitchell-Jones 2006).

2.8 Justification of % thresholds for trends^{2.4.9}

The recorded decline is greater than 1% annually over the specified time period and so no justification is required.

2.9 Main pressures^{2.4.10}

- 141 Abandonment of pastoral systems**
- 151 Removal of hedges and copses**
- 160 General forestry management**
- 162 Artificial planting**
- 164 Forestry clearance**
- 165 Removal of undergrowth**
- 167 Exploitation without replanting**

2.10 Threats^{2.4.11}

- 141 Abandonment of pastoral systems**
- 151 Removal of hedges and copses**
- 160 General forestry management**
- 162 Artificial planting**
- 164 Forestry clearance**
- 165 Removal of undergrowth**
- 167 Exploitation without replanting**

2.11 Favourable reference population^{2.7.2}

58,500 individuals (Equal to 1994 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.

Population trends from surveillance indicate that the population has declined by 23% since 1993. This represents a large decline of more than 1% per year and suggests that the current population is only 77% of the 1994 population. The EC guidelines stipulate that the favourable reference population should be at least the same as the 1994 level and using current estimates and trend information this gives a figure of 58,500 individuals as the favourable reference population value.

2.12 Population conclusion^{2.8}

Unfavourable – Bad and deteriorating

The population has declined by more than 1% annually during the assessment time period for population change and is below the favourable reference population. Furthermore, data from the national monitoring system indicate that the species is still in decline in most landscape types. For these reasons, the population conclusion is Unfavourable – Bad and deteriorating.

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

M. avellanarius has specialised habitat requirements. In the past they have most often been recorded in coppiced hazel, but they are also found in woodland habitat dominated by oak and holly, birch or oak/ash woodlands. However these latter woodland types are almost certainly poor habitat for this species. More recently, *M. avellanarius* has also been found to be present in coniferous woodland and scrub habitats.

Less intensively cut hedgerows offer suitable habitat, particularly those with a variety of woody shrub species. *M. avellanarius* may inhabit old hedgerows throughout the year, or use them seasonally to exploit autumn fruits and berries.

Generally the species prefers woodland edge, overgrown clearings and areas where there is a high diversity of trees. The best habitats seem to have a vigorous unshaded shrub layer.

The species is found in ancient deciduous woodland, dense shrubbery and coppices, particularly where there are areas of secondary growth and trees with edible seeds, such as hazel, sweet chestnut and beech. The structure of dormouse habitat is important, particularly the availability of arboreal pathways formed by sprawling coppice and climbing plants, such as honeysuckle or bramble. A variety of trees is also needed to provide a succession of food during the active part of the year (Bright, Morris & Mitchell-Jones 2006).

3.1 Surface area of habitat^{2.5.2}

Unknown

It would be possible to estimate the area of available habitat for the species, using the sum of suitable broadleaved, mixed, shrub, coppice and coppice with standards within the current range, but this would require better information on woodland types and densities than is currently available.

3.2 Date of estimation^{2.5.3}

2006

3.3 Quality of data on habitat area^{2.5.4}

Poor

Although habitat requirements of this species have been fairly well documented, there is no information on the area of habitat currently in use.

3.4 Habitat trend^{2.5.5}

Unknown

Approximately 8% of England and Wales is currently covered by broadleaved woodland (Haines-Young *et al.* 2000), the most suitable habitat 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 (Haines-Young *et al.* 2000). 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^{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}

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

Although the current trend is unknown, deforestation and inappropriate management prior to 1994 have contributed to the species post 1994 population decline. 160,000ha of ancient woodland was converted during the 20th century to plantations of conifer (50%), broadleaf (28%) or mixed woodland (22%) (Bright, Morris & Mitchell-Jones 2006).

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

Unknown

There has been reduction in quality of woodland habitat and *M. avellanarius* requires woodland that is appropriately managed. Coppice woodland is generally perceived to be optimal for *M. avellanarius* but represents only 200 km² of the total 13,000 km² of woodland in England and Wales (Bright, Morris & Mitchell-Jones 2006). This represents only 0.015% of the total woodland resource and only 0.03% of the ancient or semi-ancient woodland resource. However, extent of suitable habitat required to support a Favourable population is not known at present.

3.8 Habitat conclusion^{2.8}

Unknown

Based on expert opinion, habitat is not yet sufficient to support the species at Favourable status. However, the actual area of suitable habitat required to support a viable population is unknown at present. The conclusion is, therefore, Unknown.

4. Future Prospects^{2.6}

Poor prospects

Species expected to struggle unless conditions change.

Factors likely to affect *M. avellanarius* over the next 12-15 years are considered below.

Legislation. *M. avellanarius* is fully protected under national and European legislation. It is listed on Schedules 5 & 6 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 and on Annex IVa of the Habitats Directive.

Conservation action The species is listed as a priority species under the UK Biodiversity Action Plan (BAP) and has a Species Action Plan (SAP).

Reintroductions have been used to return dormice to parts of England where they have gone extinct. However, it is not yet clear how successful the re-introduced populations will be in the long term (Macdonald & Tattersall 2001).

The second edition of the Dormouse Conservation Handbook has been published (Bright, Morris & Mitchell-Jones 2006) providing detailed information on conservation management, legislation issues, mitigation and survey methods.

There is a national monitoring schemes in place, the National Dormouse Monitoring Programme, monitoring nestbox occupancy in approximately 243 woodland sites across England and Wales.

Threats. *M. avellanarius* is still threatened by habitat loss, fragmentation and lack of suitable woodland management, although some woodlands are being appropriately managed. The species has specific habitat requirements and, without management, coppice will become overgrown causing the woodland to become dark and shady, with the consequent loss of the understorey.

Where suitable habitat has been restored, if hedgerow connections are poor, *M. avellanarius* is unlikely to recolonise areas without help because the species is reluctant to cross open ground. The continued loss of hedgerows, particularly species rich ones, is a real problem.

Climate change. The likely impact of climate change is not yet known, but wet, mild winters and wet summers provide poor conditions for survival and successful breeding.

4.1 Future prospects conclusion^{2.8}

Unfavourable – Inadequate and deteriorating

The pressures and threats to this species are still significantly affecting species populations and they are still declining as a result.

5. Overall Assessment^{2.8}

Unfavourable – Bad and deteriorating

The species is in serious danger of becoming extinct (at least locally)

Range for this species is Favourable, population is Unfavourable - Bad and deteriorating, because of the magnitude of the continued declines, habitat is Unknown and future prospects are Unfavourable - Inadequate and deteriorating. The overall assessment is, therefore, Unfavourable - Bad and deteriorating.

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	Unfavourable – Bad and deteriorating	Population is more than 25% below the favourable reference population	2
Habitat	Unknown	No or insufficient reliable information available	3
Future Prospects	Unfavourable – Inadequate and deteriorating	Any other combination The pressures and threats to this species are still significantly affecting species populations and they are still declining as a result.	3
Overall Assessment	Unfavourable – Bad and deteriorating	One or more Unfavourable bad	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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Map Data Sources

Biological Records Centre - Mammals & Irish Otter Databases; Bristol Regional Environmental Records Centre - SW Pilot Project BAP Species Inventory 2002; Dorset ERC - Dorset SW Pilot species dataset; Natural England - Dormouse site inventory; Wiltshire and Swindon BRC - Wiltshire BAP Priority Species Distribution Records (via NBN Gateway)