



Hazel dormouse

Muscardinus avellanarius

Species Action Plan

1. Introduction

The hazel dormouse (hereinafter 'dormouse') is a species of national importance as it has declined dramatically over the last 150 years, being lost from up to 17 counties (comprising half of its former range) since 1885. It is classed as Vulnerable in the UK Red Data Book and is a species of particular concern and importance in Worcestershire.

2. Current Status

2.1 Ecology and habitat requirements

The dormouse is a distinctive native British mammal, which is infrequently seen or recorded due to its rarity, arboreal lifestyle and nocturnal habits. The dormouse ideally requires a woodland habitat with a large structural and species diversity that is managed on a medium (10-15 year) coppice rotation. Standard trees should be retained as dormice nest in hollow tree branches and can hibernate amongst tree roots. However, recent research suggests that the species is much more adaptable than previously thought (Juskaitis and Buchner, 2013) and dormice can be found in a variety of other habitats including hedgerows, scrub and mixed, young coniferous woodland. They eat flowers and pollen during the spring, fruit in summer and nuts, particularly hazel nuts where available, in autumn. Insects also supplement the diet throughout the year. Dormice are known to hibernate for as much as seven months of the year.

2.2 Population and distribution

Wales and southern England are the strongholds for this species (Mathews *et al*, 2018). There is one known population in northern England (Cumbria) but it is absent from Scotland. A recent Mammal Society study gives a total British population estimate of 930,000 individuals. This estimate was based on data and analysis carried out only on records from surveys of woodlands containing hazel and may therefore be an underestimate (Mathews *et al*, 2018).

Records for dormouse in Worcestershire (figure 1) are localised. Populations are mostly found on the western edge of the county throughout the Malvern Hills and extending north into the Wyre Forest, most notably in The Betts reserve and Ribbesford Wood. There are scattered, occasional records from elsewhere in the county, including to the south of Worcester city, with unconfirmed records to the north east of Redditch on the Warwickshire border.

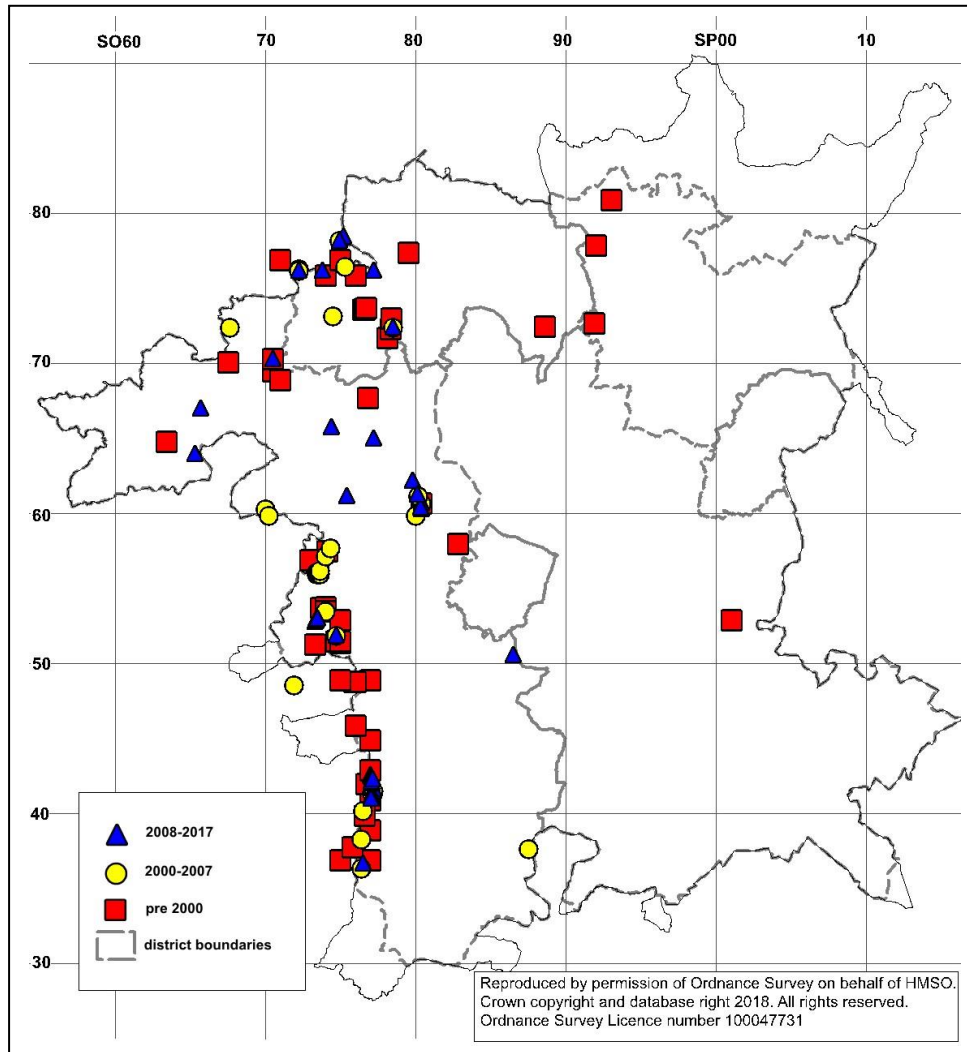


Figure 1. Records of dormouse in Worcestershire. Data supplied and map prepared by Worcestershire Biological Records Centre.

2.3 Legislation

The dormouse is listed on Appendix III of the Bern Convention and Annex IV of the EC Habitats Directive. It is protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended) and under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

2.4 Summary of important sites

Worcestershire Wildlife Trust nature reserves:

- Monkwood is a 61 ha ancient woodland located approximately 6 miles north-west of Worcester. The smaller southern part of the wood is jointly owned with Butterfly Conservation.
- The Knapp and Papermill is a 27 ha ancient woodland, meadow and orchard complex located in the valley of the Leigh Brook near Alfrick.
- Blackhouse Wood is a 39 ha Plantation on Ancient Woodland (PAWS) forming part of the Suckley ridge.
- Crews Hill Wood is a 7 ha ancient woodland immediately adjacent to Blackhouse Wood, and both reserves are less than 1km from the Knapp and Papermill.

- Hunthouse Wood is a 29 ha dingle woodland which forms half of the Dumbleton Dingle Site of Special Scientific Interest (SSSI) in the Teme Valley.
- The Betts is a 2.3 ha woodland situated on steep slope running down to the Lem Brook within the Wyre Forest.

Ribbesford Wood in the north of the county comprises 90 ha of Forestry Commission-owned predominately coniferous woodland planted in the 1970s. It lies one mile south east of the Wyre Forest but its physical connection with Wyre has been severed by the Bewdley bypass. It is also isolated to the east by the River Severn. The wood itself has no legal protection with only Gladder Brook on the southern edge of the wood designated a SSSI.

The **Wyre Forest**, which extends into Shropshire, is the third largest area of Ancient Semi-Natural Woodland in England. The plateau soils are generally acidic but the valleys and slope bottoms are more base-rich. Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus rober*) are common with ash (*Fraxinus excelsior*), English elm (*Ulmus minor* 'Atinia'), small-leaved lime (*Tilia cordata*), the nationally rare true service tree (*Sorbus domestica*) and common alder (*Alnus glutinosa*) in the valleys. Large-leaved lime (*Tilia platyphyllos*), narrow-leaved helleborine (*Cephalanthera longifolia*), soft-leaved sedge (*Carex montana*) and columbine (*Aquilegia vulgaris*) are amongst the scarcer species found. The Wyre Forest is, perhaps, the most important area for woodland biodiversity in the county because of its extent and because of its geographical and plant community links with the oak coppices of Wales, the woodlands of the south Welsh borderlands, and the East Anglian woods.

The **Malvern Hills** were designated an Area of Outstanding Natural Beauty (AONB) in 1959, comprising a total of 105 square kilometres. The AONB is unique for containing a wide variety of landscapes in a small area: 10 different landscape character types are recognised ranging from the high hills and slopes of the main ridge of the hills to the relatively flat, enclosed and unenclosed commons, which lie to the east and south-east. The north of the AONB is dominated by dense, interlocking areas of ancient, semi-natural woodland. Land within the AONB is managed by a variety of individuals and bodies, ranging from the Malvern Hills Trust - a public body established by Act of Parliament - to large private estates and small community Trusts. The AONB Partnership provides a broad framework for the care of the area and supports all those bodies that are involved in looking after it.

3. Current factors affecting the species

- The changing climate may be affecting hibernation patterns and availability/timing of food supply.
- Woodland management for other species can be inappropriate for dormice.
- Habitat fragmentation leading to population isolation.
- Lack of species rich woodland and linking hedgerow networks due to a lack of or inappropriate management.

- Rising deer population in some woodlands causing change in habitat structure.
- Insufficient knowledge of the species and lack of data regarding distribution beyond the main study sites.
- Possibility of competition from grey squirrel (*Sciurus carolinensis*) and other small rodent species for food and for hibernation and breeding sites.

4. Current Action

4.1 Local protection

Monkwood, the Knapp and Papermill, Crews Hill Wood and Hunthouse Wood nature reserves are all SSSI. The Betts reserve falls within the Wyre Forest SSSI.

Blackhouse Wood is a Local Wildlife Site (LWS), which affords a level of protection within the planning system, and falls within the Malvern Hills AONB. Ribbesford Wood is also a LWS.

Many of the important dormouse sites on the Malvern Hills fall within the AONB and or the Malvern Hills SSSI.

4.2 Site management and programmes of action

Worcestershire Wildlife Trust

All reserves containing woodland and scrub are informally checked for dormice and when coppicing is carried out on occupied sites it is done in a dormouse friendly manner:

- Management of Monkwood is on 7 year and 20 year coppice plot rotations together with ride widening. Glades are also being opened up in areas containing dormouse boxes.
- Coppicing of ride sides is carried out at the Knapp and Papermill.
- Coppice plots at Blackhouse Wood are being brought back into management under PAWS restoration. Rideside coppicing and glade clearance take place on a 4-5 year rotation, with some permanent glades cut annually.
- Crews Hill Wood and Hunthouse Wood are managed as non-intervention woodlands and are largely left to natural processes.
- At The Betts reserve small-scale coppicing is underway. All management is directed at providing better dormouse habitat.

Ribbesford Woods

The Forestry Commission has been carrying out a Dormouse research project in Ribbesford Wood since 2000 to monitor populations during PAWS (Planted Ancient Woodland Site) reversion. 380 boxes have been checked monthly between May and October as part of the National Dormouse Monitoring Programme (NDMP). Animals have been microchipped since 2002 to follow individuals throughout their lifespan. Survival rates and juvenile dispersals during the reversion process have been recorded to measure the success, or not, of 4 different methods of reverting conifers back to native woodland. 3 such operations have taken place (see below) and the 4th and final removal of conifers will be in 2020/21. This research will continue to monitor the population dynamics of the resident dormouse population until well after the conifers have been

removed. An annual update of this work is published in the Wyre Forest Study Group Review.

In the autumn and winter of 2003/04, 2009/10 and 2015/16 four experimental thinning operations were carried out in the research area:

- **Treatment 1** - (Hand cut with chainsaws and forwarder extraction - autumn) Small areas of conifers were felled (approximately 20mx20m) to create small glades within the crop. The idea being that these would regenerate naturally in years to come and would provide viable habitat for dormice by the time of the next operations in 5 years.
- **Treatment 2** - (Harvester operation with forwarder extraction – winter) As treatment 1.
- **Treatment 3** - (Harvester operation with forwarder extraction - autumn). Two larger areas of conifers were felled (approximately 0.3 Ha). This replicates the normal coppice plot size in the broadleaf scrub habitat, which dormice favour. Again this should regenerate naturally in years to come and would provide viable habitat for dormice by the time of the next operations in 5 years.
- **Treatment 4** - (Harvester operation with forwarder extraction - winter) Normal thinning operation removing 30-35% according to standard thinning tables.

Malvern Hills

Following on from the Dormice on the Malvern's Project 2006 (see section 4.3 below) the majority of landowners with survey sites on their land were provided with copies of Natural England's revised Dormouse Conservation Handbook and have been offered management advice on a one to one basis.

The Malvern Hills Trust, which manages around 1200 hectares of the hills, has a Land Management Plan (currently for the period 2016-2021). The habitat requirements of the dormouse need to be carefully balanced with those of other species on the hills, notably adder (*Vipera berus*).

In 2017 data from the Malvern Hills NDMP nest box schemes (see 4.3) was analysed within a Geographical Information System to assist the Malvern Hills Trust in targeting habitat management works to benefit dormice (Taylor, 2018).

Natural England has published guidance documents on dormouse ecology and conservation including The Dormouse Conservation Handbook in 2006.

4.3 Survey, research and monitoring

The National Dormouse Monitoring Programme (NDMP)

This programme is run by People's Trust for Endangered Species (PTES), funded by Mammals Trust UK and Natural England, with the aim of collecting long-term data about annual variation in timing and success of breeding from key dormouse sites around the country. It also monitors population density in different habitats and areas. Volunteers put up and monitor nest boxes on over 200 sites

in England and Wales and all of the information is collated centrally by the NDMP. Figure 2 shows population trend data from 1993 to 2015.

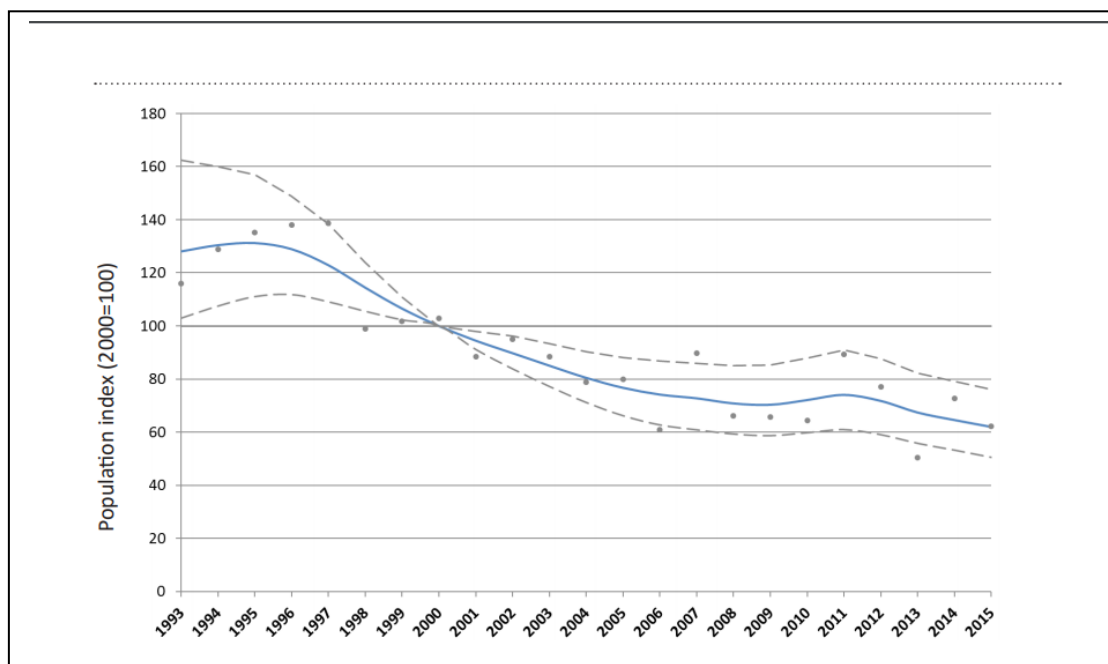


Figure 2. Dormouse population change recorded at NDMP sites between 1993 and 2015. Annual values (circles) are estimated relative to that in 2000, which is given a value (or 'index') of 100. The underlying trend, smoothing out fluctuations, is shown by the solid line. Statistical confidence limits are shown by the broken lines. Data excludes reintroduction sites. Source: State of Britain's Dormice 2016, PTES.

Counts of dormice since the mid-1990s show a steady decline. Since 1993, the smoothed index of counts has halved and fallen by over a third (38%) since 2000. The rate of decline since 2000 is equivalent to a fall of 55% over 25 years.

Great Nut Hunt

PTES launched the first Great Nut Hunt during National Dormouse Week in 1993 and the survey was subsequently repeated in 2001 and 2009-11. In 1993 more than 330 dormice sites were identified, whilst in the 2001 survey this fell to only 132 sites. However, the 2001 survey resulted in 108 new dormice sites being recorded across the UK and 24 of the sites identified in 1993 were still occupied. 58 sites found to be dormouse-positive in both 1993 and 2001 were re-surveyed in 2009-11: 21 of those sites showed evidence of dormice still being present.

Forestry Commission

See details in section 4.2 above of the FC research and management programme in Ribbesford Woods. The research will continue to monitor the population dynamics of the resident dormouse population during PAWS restoration and survey data will be passed to the NDMP. Monitoring and sympathetic management also takes place in Wyre Forest where 100 boxes in 5 areas are checked as part of the NDMP.

Worcestershire Wildlife Trust

Nest box monitoring is ongoing at Monkwood, The Knapp & Papermill, Blackhouse Wood, Crews Hill Wood, Hunthouse Wood and The Betts reserves.

Monkwood has over 100 boxes checked as part of the NDMP. The Knapp & Papermill currently has 50 boxes and over 50 tubes that are checked informally. Blackhouse Wood has 50 boxes and 50 tubes and there are a further 50 tubes at Crews Hill which are all checked monthly as part of the NDMP. Hunthouse Wood has over 50 boxes and tubes which are also part of the NDMP and checked monthly through the season.

Dormice on the Malverns Project

In 2006, Herefordshire Action for Mammals initiated a project to survey the Malvern Hills and establish current dormouse distribution. The project involved 13 current licence holders and around 35 volunteer members of the public. 450 nest tubes were put up on 23 sites resulting in 17 confirmed dormouse nests on 7 sites and 8 live dormice sightings. Four NDMP nest box schemes were subsequently established in different locations around the hills.

Worcestershire Recorders

The first Worcestershire Mammal Atlas was published in 2012 with records from the period 1995-2007. Records are currently being collected and collated for a 2008-2019 update to the atlas.

Finding Rare Species on the Malverns project

Worcestershire Biological Records Centre is currently running a 2-year project (2017-2018) to increase knowledge of the distribution and abundance of rare species in and around the Suckley Hills area of the Malvern Hills AONB. The dormouse is one of the flagship species for which survey work is taking place.

5. Associated Plans

Wet woodland, Woodland, Hedgerows, Ancient and Veteran trees, Orchards, Scrub.

6. Conservation Aim

Existing dormouse populations on core sites within the county are maintained and our knowledge of dormouse distribution across the whole of Worcestershire is improved

7. Conservation Objectives

- Maintain habitat management and monitoring effort on core sites (Ribbesford Wood; Monkwood; Knapp and Papermill; Blackhouse Wood)
- Re-establish and maintain Worcestershire Dormouse Group to improve communication between partners and the co-ordination of surveyor effort
- Increase the number of permanent monitoring sites in the NDMP
- Test new footprint tube survey methodology on known sites with a view to rolling out more widely to unsurveyed sites or those with unconfirmed records
- Following completion of the Finding Rare Species on the Malverns project, use resulting data to implement a Phase 2 of the Dormice on the Malverns survey encompassing key sites along the entire length of the hills

- Carry out a habitat opportunity mapping exercise to identify locations for management work to reduce fragmentation between dormouse populations in Wyre Forest and Malvern Hills districts

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