The State of Britain's Dormice 2019

people's trust for endangered species

David Wembridge, Ian White, Nida Al-Fulaij, Emily Marnham and Steve Langton

Hazel dormice, *Muscardinus avellanarius*, are the subject of one of the longest-running monitoring programmes of any British mammal. The 29-year old programme currently includes counts of dormice at several hundred woodland sites each year across England and Wales. Nationally, the population has declined by a half since 2000, yet at some sites, dormice numbers are increasing. Recent research has begun to explain why some sites might be better than others and the reasons for the decline. Key to the drop in numbers is whether sites are managed or not. Work is ongoing but the information, collected as part of the monitoring programme by hundreds of volunteers, is helping us to understand why this emblematic species is disappearing from Britain's woodlands and wider countryside.

The State of Britain's Dormice 2019 presents an analysis of data collected as part of the National Dormouse Monitoring Programme (NDMP), showing the most recent population trend and status of hazel dormice.

Range and population change

In Britain, dormice are found almost entirely south of a line between Shropshire and Suffolk. Counts of dormice in nest boxes since the mid-1990s show a steady decline. Since 2000, the population has fallen by a half (51%), decreasing on average by 3.8% per year.

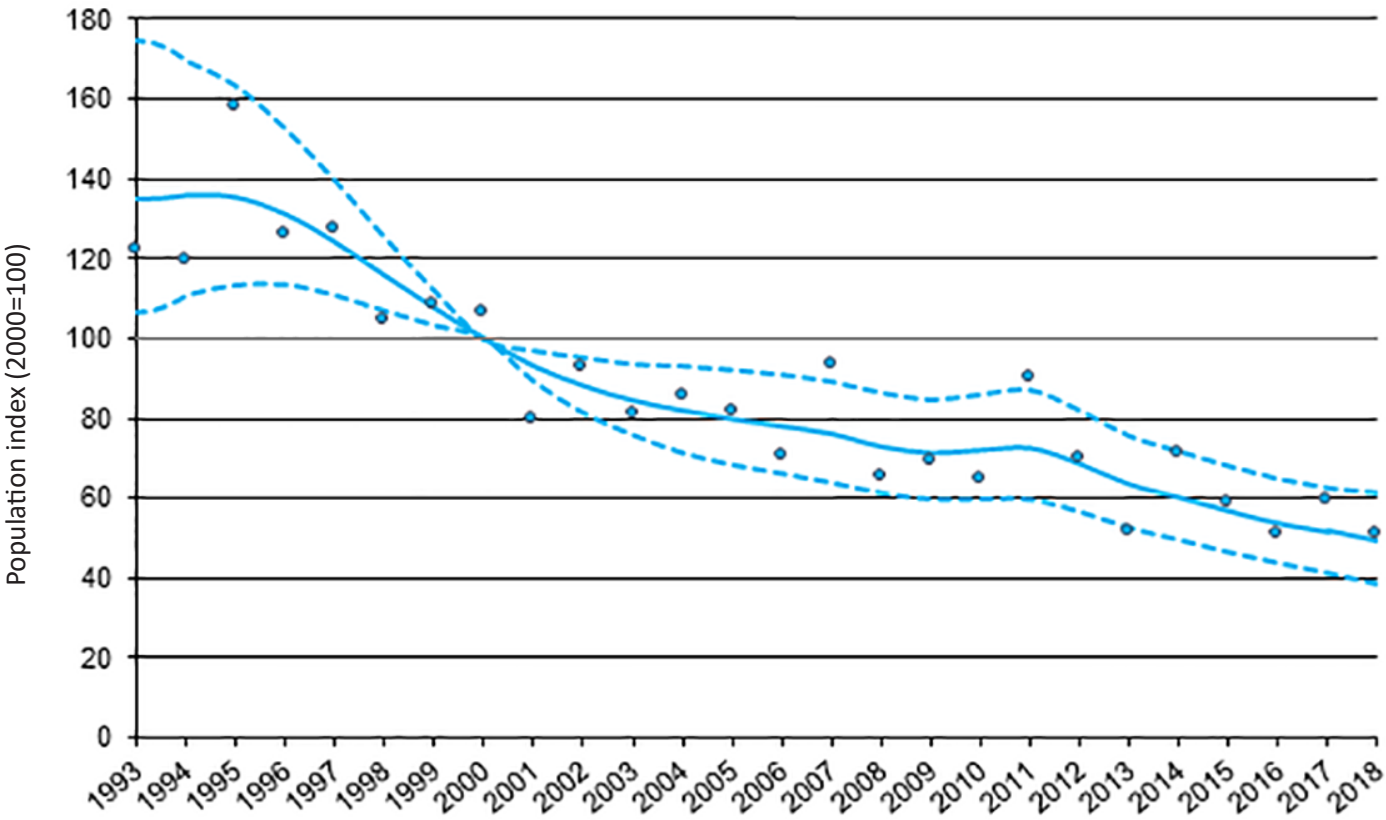
In Britain dormice are threatened, qualifying as 'Vulnerable' to extinction under Red List criteria.

Is the decline slowing?

It may be slowing slightly. In the last ten years (2009-18), there was an average annual decline of 3.71%; in the decade before (1999-08), the decline was 5.45%. This might indicate that the situation is stabilising, but the difference is not statistically significant and so we can't be certain that the decline across NDMP sites is slowing.

In the last 18 years the population has fallen by 51%

On average, NDMP sites show a decline in dormouse numbers, but there are some sites where dormice are doing well. Populations are stable or increasing at 96 of 336 sites analysed (29%) and at 28 of these (8% of the total), the average annual increase is 5% or more per year.



The population change recorded at NDMP sites between 1993 and 2018. *The underlying trend, smoothing out fluctuations, is shown by the solid line and is expressed relative to the 2000 level, which is given a value of 100. 95% statistical confidence limits are shown by the dashed lines. Annual values (circles) are shown to indicate year to year variation around the smoothed line.*

How is population index estimated?

At best, spotting animals that are small, nocturnal and arboreal is difficult, and counting every dormouse in woodlands and hedgerows across England and Wales isn't feasible. Instead, we rely on counts from a sample of sites where volunteers record dormice occupying nest boxes. This allows an estimate, or 'index', to be calculated of the relative population size each year. The index is estimated using the highest counts of adult dormice in either May or June at sites with a minimum of 20 nest boxes, surveyed for five or more years. It takes into account differences in the number of sites contributing data each year.

Reasons for the decline

The NDMP is only a sample of dormice populations across England and Wales, and nest boxes cover, on average, only about 15% of the total area of each site. Typically, boxes remain in the same location for many years and as the habitat changes, dormice may move to occupy other, more favourable, areas of the woodland. Interpreting the data is also complicated by the fact that sites have joined the NDMP at different times and may be very different in size and composition.

Given these issues, how well does the decrease in dormouse numbers at NDMP sites reflect the situation in the wider landscape? Can the particular features of NDMP sites tell us something about what is causing the decline?

© Liam Bunce

In terms of size and woodland type, NDMP sites are more or less typical of woodlands as a whole in England. NDMP sites join the programme typically because dormice are thought, or known, to be present at the site. But this isn't a guarantee that these woodlands will remain suitable for dormice in the long-term as woodland structure changes with age.

Establishing the relative impacts of habitat loss and fragmentation, climate change and other threats is difficult, but evidence from the NDMP points to one factor in particular: a loss of habitat quality. Recent work has found that active woodland management at NDMP sites, along with the particular tree and shrub species present, and habitat connectivity, are correlated with greater dormouse abundance and breeding.

Management is important because it can produce a mosaic of different habitats with areas of newer, shrubby vegetation between mature trees, and a diverse mix of species. Dormice need a varied woodland structure. They use tree holes to nest in, bramble and other shrubs for food, and an understorey to move about in.

Since the 1980s, new woodlands, and those planted to replace conifers, have tended to be broadleaved. As these forests mature, however, they can become less suitable for dormice. Between 1998 and 2007, the Countryside Survey found that canopy cover became denser and that half of the

Threats

Loss and fragmentation of habitat
The loss and fragmentation of habitat are often key factors contributing to species' declines. A changing climate and changes in the quality of habitat are also factors likely to affect dormouse populations.

Dormice are susceptible to unseasonable or extreme weather, which can affect the availability of foods such as insects, flowers and fruits. A changing climate can also affect hibernation patterns. Warmer, wetter winters are likely to be detrimental, especially if seasons are unpredictable.

Habitat loss can lead to a more 'fractured' landscape, with patches of habitat and isolated populations. As well as being an important habitat in their own right, hedgerows act as wildlife corridors, connecting 'disparate habitats like railway lines between stations'. They are particularly important for arboreal species like dormice that avoid coming to the ground. Isolated populations, poorly connected to other habitats and populations, are more susceptible to the vagaries of local events—'poor years' that can tip numbers below a threshold minimum.

Loss of habitat quality
Dormice prefer structurally diverse habitats: they're more numerous in woodlands with varied tree heights and scrubby areas, and prefer to move through areas of woodland edge and dense vegetation. As woodlands age, and large stands of mature trees dominate, the habitat becomes less diverse and its quality for dormice declines.

Historically, this diversity was maintained by traditional management practices, including coppicing (typically of hazel, sweet chestnut, hornbeam or ash) and small-scale tree felling, which create areas of new growth and a mosaic of trees of different ages and sizes. Coppicing declined by the beginning of the 20th century, as coal replaced charcoal for iron smelting. Scrub, too, which had been an important part of rural economies (providing foods such as elderberries, sloes and blackberries, fuel and fencing materials such as hawthorn) was less valued as a resource. Without these practices, many of the woodlands planted in the last forty or fifty years have become less suitable for dormice.

Advice and guidance on managing woods and hedgerows for dormice and other wildlife are produced by PTES and other organisations. PTES' *Managing small woodlands for dormice* is available to download at **www.ptes.org/dormice-woodlands**

What we are doing to conserve dormice

- Various projects are connecting and improving dormouse habitats across wider landscapes. PTES is funding three of these: in the Test Valley in Hampshire, in Nottinghamshire, and in Wensleydale in Yorkshire.
- Led by PTES, captive-bred dormice have been released at 24 NDMP sites since 1993 with the aim of establishing wild populations in counties and areas where they were previously extinct. Further releases at successful sites are planned to improve genetic diversity.
- PTES runs training courses for volunteers wishing to become dormouse monitors and for professional ecologists who work with the species.
- PTES and ecological consultancy, Animex, showed that dormice will use an arboreal bridge to cross a railway line. The first commercially available version is now in place over a road in South Wales.
- Dormice need mature, species-rich hedges. PTES' *Great British Hedgerow Survey* aims to check the health of hedgerows nationally, so that conservation efforts can be better targeted, and owners receive tailored advice on how best to manage hedges.
- Researchers at Cumbria and Exeter Universities, part-funded by PTES, are looking at the hibernation patterns of dormice to understand their needs throughout winter when they are most vulnerable.
- The NDMP, coordinated by PTES, continues to monitor dormice and inform conservation efforts into the future.

top ten plant species occurring more frequently were trees rather than shrubs. The number of plant species in broadleaved woodlands also decreased, by almost a tenth, between 1990 and 2007. As woodlands develop, shrub and understorey species can be shaded out and, with little mid-height vegetation, the habitat is poorer for dormice.

Utilising woodlands more, for their amenity value, timber and agroforestry, and management activities (such as harvesting, thinning, coppicing or maintaining rides and glades) could help to improve the quality of woodlands for dormice and other species if done sensitively. In conifer plantations, there's evidence that felling and restoration of broadleaved woodland can be both economically viable and preserve local dormice populations. ●

Acknowledgements

Underlying the monitoring programme is the work of hundreds of volunteers over many years. Their efforts, knowledge and experience have been invaluable to the conservation of hazel dormice.

Pat Morris and Paul Bright were instrumental in setting up the NDMP, following the work of Doug Woods and Elaine Hurrell in the 1970s and 80s. Recent work by Cecily Goodwin, Fraser Combe, Edwin Harris, Roger Trout, Robbie McDonald and others (at Exeter and Manchester Metropolitan Universities) has highlighted the importance of woodland management for dormice and begun to understand the impact of a changing climate.

People's Trust for Endangered Species
3 Cloisters House
8 Battersea Park Road
London SW8 4BG

www.ptes.org
enquiries@ptes.org
020 7498 4533

facebook.com/ptes.org
twitter.com/PTES
instagram.com/ptes_org

Volunteers at woodlands on the Isle of Wight, recording dormouse numbers and biometric data. Dormice are temporarily held in a plastic bag but are quickly released unharmed.

PTES runs training courses on dormouse ecology, conservation and woodland management at its reserve on the Isle of Wight. These provide training and experience for volunteers and ecological consultants working towards gaining a dormouse licence, and knowledge to better develop mitigation plans for dormice.

Woodlands on the Isle of Wight are an excellent habitat for dormice, in part because there are no wild deer on the island and new, shrubby growth can develop in the absence of browsing.

Recent work published in the scientific press

Goodwin, CE, Hodgson, DJ, Al-Fulaij, N, Bailey, S, Langton, S & Mcdonald, RA (2017) **Voluntary recording scheme reveals ongoing decline in the United Kingdom hazel dormouse *Muscardinus avellanarius* population.** *Mammal Review*, 47 (3): 183-197

Goodwin, CE *et al.* (2018) **Climate, landscape, habitat, and woodland management associations with hazel dormouse *Muscardinus avellanarius* population status.** *Mammal Review*, 48 (3): 209-223

Harris, E & Combe, F (2018) **Woodland management practice and dormouse population trends.** A report to PTES

Trout, RC, Brooks, S, Combe, FJ & Rudlin, P (2018) **The different effects of periodic experimental tree removal patterns on the population demography of the hazel dormice (*Muscardinus avellanarius*) in a conifer plantation.** *Folia Zoologica*, 67 (2): 110-120

White, IC & Hughes, SA (2019) **Trial of a bridge for reconnecting fragmented arboreal habitat for hazel dormouse *Muscardinus avellanarius* at Briddlesford Nature Reserve, Isle of Wight, UK.** *Conservation Evidence*, 16: 6-11