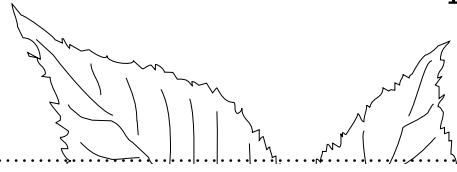


# The **Dormouse** Monitor

DECEMBER  
2018

people's  
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species



## Detecting hazel dormice

Studies into the effectiveness of footprint tracking tunnels and camera traps to find dormice, give us new tools to learn more about these elusive creatures.

### Roach's mouse-tailed dormice

Nedko Nedyalkov is leading a team of scientists in Bulgaria to learn more about this little-studied creature.

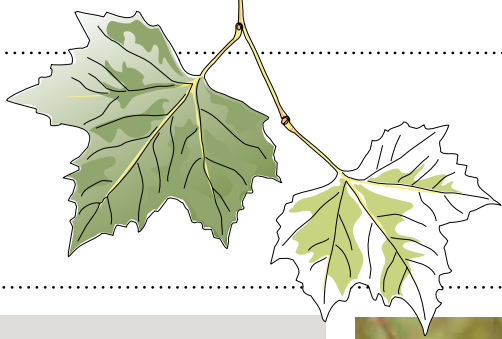


### Creating corridors

Leo Gubert highlights the need for creating habitat for hazel dormice along roads, ensuring corridors to connect populations.

### Ever considered creating a lace dormouse?

Ruth Moffat, Warwickshire Dormouse Group, describes combining her passions for dormice and lace-making.



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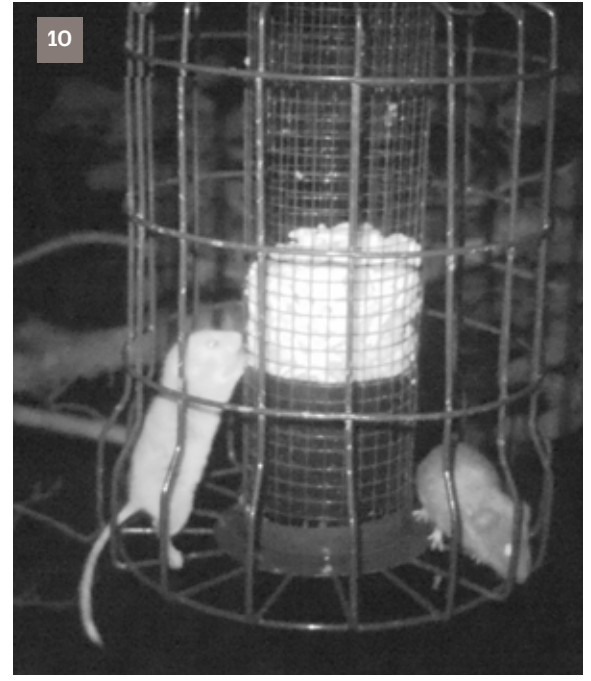
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# In this issue



## Welcome



At our woodland nature reserve, Briddlesford Woods, on the Isle of Wight, we had our lowest counts for years. Our summer was staggeringly hot and we've yet to understand what impacts this had on our wildlife. We know that the dormice were not using the nest boxes in summer or autumn at the levels that they usually do. However all the animals

we found in October were young born this year. So the females were breeding - but where?

Encouragingly we had news from an NDMP site near Brighton that they found dormice in their boxes for the first time in five years. We still have much to learn about how wildlife responds to different weather and climatic conditions. However results from analyses carried out at the University of Exeter, confirm that dormice do better in woods that are actively managed (page 7). These findings are the first tools we need to help dormice in a practical way, and attempt to stop their decline. **Nida Al-Fulaij & Susan Sharafi**

*Nida Al-Fulaij* *Sharafi*

Editorial team: Nida Al-Fulaij, Susan Sharafi, Zoe Roden  
Illustrations: Hayley Cove

Cover image: [Kerstin Hinze](#)

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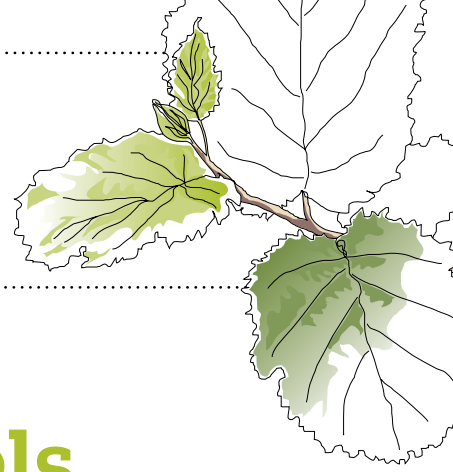
### Contact us

The Dormouse Monitor  
3 Cloisters House  
8 Battersea Park Road  
London SW8 4BG

[www.ptes.org](http://www.ptes.org)  
[enquiries@ptes.org](mailto:enquiries@ptes.org)  
020 7498 4533

[facebook.com/ptes.org](https://www.facebook.com/ptes.org)  
[twitter.com/PTES](https://twitter.com/PTES)  
[instagram.com/ptes\\_org](https://www.instagram.com/ptes_org)

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# Finding dormice using footprint tracking tunnels

Simone Bullion and Alison Looser, Suffolk Wildlife Trust, decided to put footprint tracking tunnels to the test and see if they are comparable to nest boxes or nest tubes.

Surveying hazel dormice is rarely easy – not only are they small and nocturnal, they spend up to three quarters of the year tucked up in hibernation or summer torpor, and their active hours are mostly spent well out of sight in trees and dense thicket vegetation. Recording their presence is often a case of searching for field signs rather than the dormice themselves.

We've been investigating the potential of a new monitoring technique using footprint tunnels and comparing the results with those from traditional methods such as searching for

gnawed nuts and surveys using nest boxes and nest tubes. Dormouse footprints are easily distinguished from those of other small mammals, as they have distinctive triangular-shaped palm pads, while the pads of similar-sized wood and yellow-necked mice create rounded marks.

We surveyed a dozen sites in south Suffolk, placing 50 nest tubes, 50 nest boxes and 50 footprint tunnels at each site. We divided our sites into areas of woodland, hedgerow and scrub. Each site was surveyed from early April to late

November, with regular checks of the tunnels, tubes and boxes and additional searches for nuts and natural nests.

Of the 12 sites, 10 showed evidence of dormice and we found the footprint tunnels to be a very sensitive method of detection. In total we recorded 1680 sets of dormouse footprints over the year, from 316 different tunnels. We found a total of 93 individual nests in nest tubes and 61 nests in nest boxes and recorded 182 actual

dormice throughout the season. Overall, the footprint tunnels gave a detection rate of

approximately 28%, compared with 3% for nest tubes and 2% for nest boxes.

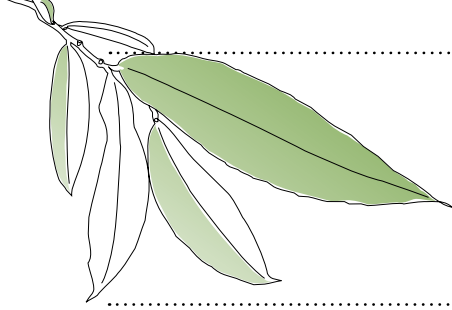
In addition to their efficacy, tunnels have several further advantages. They can be used without a licence, although training in their use is recommended to ensure the best outcome. They may be more suitable in areas where there are high levels of public disturbance, as the risk to dormice is reduced. They're also cheap, costing about £2 per unit, excluding the card, oil and carbon powder. We're delighted by the results..

**Hazel dormice have distinctly shaped triangular foot pads**



ALL IMAGES SUFFOLK WILDLIFE TRUST





# Breeding by young of the year female dormice in Lithuania

Most female dormice don't breed in their first year. Dr. Rimvydas Juškaitis, Institute of Ecology of Nature Research Centre, explains how whether a female dormouse breeds or not, depends on the population density .

Hazel dormice usually start to breed after their first hibernation, when they are one year old. However, many cases of breeding of young early-born females, in the year of their birth, have been recorded in Lithuania. In other parts of their range, only solitary cases of breeding by females in the year that they were born have been recorded. These incidents have been noted in the Tula and Moscow regions of Russia, Switzerland, eastern Saxony in Germany, Romania, southern England and northern Wales. Breeding by young-of-the-year females may be occurring more frequently or in other parts of their range but it is almost impossible to detect without animals being individually marked.

In the two Lithuanian populations that have been investigated, breeding by females in their first year made up 18.3% of all births recorded between 1981 and 2013.

758 births were recorded, of which 139 were babies in litters of females less than a year old. These female dormice usually had their litters between mid-August and early September. By marking the animals it was clear that most of these females were born in June, with a few being born in late May and early July. On average this meant the

**18.3% of births recorded from 1981 & 2013 were by female young of the year**

dormice were 60-80 days old when they had their first litters.

Of the 95 litters that were observed, litter size varied from one to six babies. The average was 3.86 which is smaller than the average of litter sizes born to females who

have gone through their first hibernation (4.29). Between 1984 and 1992, two study sites were monitored in Lithuania. The difference in the number of young of the year females which gave birth was quite substantial. At site B 19.2% of the females that bred were young of the year, compared with only 5.1% at site A. It seems that they may be a correlation with the population densities within the woods. The density of animals at site B was lower, and consequently 25.3% of females born early took advantage and had litters before they went into their first hibernation, compared with only 7.9% at site A. Interestingly during the second phase of the study, between 1997 and 2013, the proportion of breeding cases by females who were born earlier in the year increased to 20.4% of all breeding cases recorded at site A.

So why do some females breed and have





their first litters in the same year that they're born, when others don't? The answer appears to be inversely related to population density of adult females. The strongest negative relationships were found between the proportion of breeding cases of involving young-of-the-year females and the density of adult females in July, and the number of breeding case of adult females. At site A the highest proportions of breeding cases by young of the year females were seen in 2006, 2007, 2011 and 2013, which were also the years when the lowest adult female densities were recorded in July. Only a few cases of breeding by young of the year females were recorded in 2012, a year in which the total population density was rather low, but the density of adult females was moderate in summer.

Breeding by females born the same year is one response to density-dependent self-regulation that has been discovered in hazel dormouse populations. It is widely accepted that populations can be regulated in part due to reproductive suppression. Consequently not all females who are capable of breeding within a population actually do so.

Adult hazel dormice are relatively

sedentary, they have fixed home ranges and females are not able to breed if they don't have a territory in which to feed. Hence, if a population of dormice has a high number of females, the young ones born that year won't be able to find their own patch of woodland and breed. Early-born females can breed in the year of their birth without affecting their chances of surviving the winter hibernation, but established, older

### Populations can be regulated in part due to reproductive suppression

females do suppress their breeding at times when the population density is at a moderate level.

Hazel dormice hibernate in response to lack of food over winter, but this also impacts and restricts their breeding season, meaning that only females that are born earlier in the year may have an opportunity to breed during the summer of their birth. Animals that hibernate are heavily reliant on putting on sufficient fat reserves just before going into hibernation to see them through potentially long, cold winters. Because of

this it make seem that young of the year females that breed in their first year may stand less chance of surviving hibernation. However, survival rates of young of the year females that had and those that hadn't had litters in their first year were very similar. At both study sites, the percentage of females that survived was slightly higher in the group that had given birth, but the difference was not significant.

Breeding by young of the year females in Lithuania is not only common, but it's played an important role in restoring populations that are at low densities in the summer. These Lithuanian dormouse populations appear to have much higher levels of breeding by young of the year females than elsewhere in their range. Perhaps it is related to geographical differences between these, and other populations.

This article was based on a published chapter in the following publication: Juškaitis R. 2014. The Common Dormouse *Muscardinus avellanarius*: Ecology, Population Structure and Dynamics. 2nd edition. Nature Research Centre Publishers, Vilnius, 195 pp.



Janine Edmonds



# Hazel dormice need more woodland management

Dr Cecily Goodwin recently completed her PhD at the University of Exeter. Her investigations into the impact of woodland management on hazel dormice reveal useful information about what we can do to help these animals thrive in the future.

More woodland management is needed to help save dormice. Managing woodlands to a greater extent could help stop the decline of Britain's dormice. Dormouse numbers are falling in Britain – down by 72% in just over 20 years – which could reflect changes in climate and the composition and structure of woodland habitats.

The findings, from two new studies led by the University of Exeter, show dormice favour woodland with varied heights and areas of regrowth, including species such as hazel and yew that provide the flowers, fruits and nuts they enjoy. Using NDMP data collected over twenty years from 300 sites across England and Wales, the team investigated hazel dormouse numbers, breeding and population trends in relation

to climate, landscape, habitat and woodland management.

Although the continued decline in hazel dormouse numbers across England and Wales is really worrying, luckily with so many people involved in monitoring the populations that do remain, we are in a good position to look at these sites and

## Dormice favour woodland with varied heights of regrowth

see if we can identify any similarities at those sites where dormice are doing well and those where they aren't to make some inferences as to what they need to thrive.

Thanks to you, the monitors, we were able to provide the team with long term data on dormouse numbers at hundreds of sites. Combined with that, PTES was also able to supply the researchers with critical habitat information about the sites, what species were present, what age structure the sites are, and whether any management is being undertaken in these woods, either near and around where the nest boxes are sited, or in other adjacent areas.

Only data from sites that have been monitored for at least five years were included, because otherwise it wouldn't be possible to detect any true changes in the populations. Any sites where dormice hadn't been recorded at all were also excluded from the study.



The team obtained monthly climate data from the UK Met Office at 5km square resolution. From these data they were able to investigate whether any weather variables had correlations with dormouse numbers too. They considered temperatures (maximum, minimum and mean), rainfall (total monthly and days with higher than 10mm rainfall).

An understanding of how the surrounding habitat and any changes in habitat might impact dormouse populations was also taken into account. The team looked at the habitat directly within each NDMP site, the wider site (if for instance boxes are only put up in a small part of a wood) and also the landscape within 1km of each site.

In all numerous factors were considered, but it is critical we understand what enables dormice to thrive in an area, especially here in the UK where we have such little woodland left, compared with the continent. We also have a more erratic weather system so hibernating animals, such as dormice, are particularly vulnerable. The work at Exeter has revealed that active woodland management, which can include coppicing, glade creation and small-scale

tree felling, is really important. Woodland management that creates a mosaic of trees of different ages and sizes, especially areas of new growth and medium-height trees, is beneficial for dormice. Dormouse numbers are higher in woodlands with more varied tree heights and scrubby areas, and they prefer to use areas of woodland edge, and dense trees and shrubs, when they move around at night.

Dr Cecily Goodwin, who led the research, confirmed that habitats that are found to be good for dormice have been in decline. Dormouse conservation would benefit from more broadleaf woodland in the landscape and more diverse woodland structure – ranging from new growth and scrub to mid-height woodland to old trees. There has been a decline of woodland management that creates diverse forests, and an increase in large stands of mature, single-age trees, which are not such good habitats for dormice or various other declining woodland species, such as some birds and butterflies.

Another finding highlighted the fact that hibernating dormice benefit from consistently cold winters. It seems that variable winters most likely cause the

sleepy rodents to waste energy by waking up only to return to hibernation. Climatic changes in Britain are likely to have contributed to dormouse declines.

The papers are entitled: "Habitat preferences of hazel dormice *Muscardinus avellanarius* and the effects of tree-felling on their movement" (published in the journal *Forest Ecology and Management*) and "Climate, landscape, habitat, and woodland management associations with hazel dormouse *Muscardinus avellanarius* population status" (published in *Mammal Review*).

Both studies were funded by the Forestry Commission and NERC, and the Mammal Review study was commissioned and funded by PTES. And of course this work was only possible thanks to all your efforts, as monitors, who provided all the dormouse data and woodland information for the team to analyse. We will soon be creating a woodland management advice booklet for all monitors and woodland owners, to help ensure that our remaining dormouse populations stand the best chance of survival. It will be widely available for monitors and woodland owners.



Tony Wellbelove



# 10,000 new trees create wildlife habitat in the south west

Habitat creation often conjures images of new woodlands or hedgerows. However planting in unlikely places, such as along roads, can have huge benefits for dormice.

In spring this year, almost 10,000 native trees and shrubs were planted at twenty one sites in Devon and Cornwall. The aim of the project was to fill or reduce gaps in hedgerow and woodland along the roadside. In all the newly planted trees and shrubs will provide around three extra miles of vegetation and connect over 105 miles of habitat on the verge and land adjacent to the A30 and A38. The scheme is being delivered under Highways England's national Biodiversity Plan which is being supported by a £30 million national investment programme over the next five years.

Part of the importance of the plan is that it recognises that road verges and nearby land can be managed to provide areas of habitat, relatively free from human access, that may be scarce in the

surrounding landscape. This is important for a species such as hazel dormice, who rely on connected patches of habitat.

These road verges can also be used to connect fragmented habitats in the

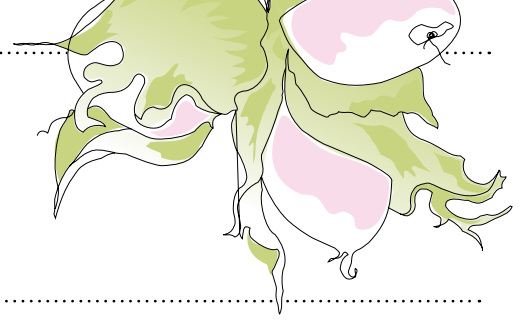
**10,000 plants, including oak, maple, rose, honeysuckle, willow and holly have been planted**

wider landscape, enabling plant and animal populations to move and interact, and so become stronger and more resilient. Leonardo Gubert, an ecologist working on the project, who is undertaking a PhD on hazel dormouse ecology at the University of Exeter, has

been involved in the work. He explained that Highways England (HE) is keen to protect the environment through its biodiversity plan and improve the connectivity of habitats along our roads. This main aim of this improvement scheme is to reconnect wildlife habitat and ecosystems on a significant scale across our road network in the South West allowing species to move between core areas.

The work will hopefully have a huge benefit for a wide variety of species of animals including insects, birds, and mammals, such as butterflies, bees, flies and dormice. Such habitat improvement should provide them with suitable places to forage, shelter and breed. The tree and shrub species being planted include oak, maple, holly, willow, honeysuckle and rose. The work has been carried out at locations





between Pocombe Bridge and Pulsack on the A30 and Wrangaton and Bellamarsh on the A38.

Leo's earlier work with Paul Chanin has demonstrated that dormice are found, and do use, road verges. By bolstering this habitat it is hoped that populations that don't live in large tracts of woodland, have a chance of thriving too. We hope to report back on this planting in the near future to report any records of hazel dormice in the newly planted up areas.

Roads are known to fragment habitat in the wider landscape, so identifying areas that can be planted up with native species to create crucial corridors for hazel dormice and other wildlife, is critical to their long-term survival in an area.



IMAGES: Highways England





## Detecting dormice, do cameras work?

Paul Chanin, an independent mammal ecologist, and Tom Gray, ecological consultant, describe their research into using camera traps to detect whether hazel dormice are present at sites.

A few years ago, Cheryl Mills devised an ingenious way to detect dormice using camera traps and footprint papers. If you saw one of her presentations, you will have enjoyed watching dormice scrambling around the bird feeders she had suspended in woodlands in Cornwall.

We were particularly impressed with the fact that she was able to record the presence of dormice in a very short time with half of her feeders being used by dormice less than a fortnight after they were installed. This seemed to be a really useful idea for ecological consultants who often have to spend several months checking nest tubes for dormice or their nests, so we decided to test it further.

We were fortunate to be supported by Arup Group Limited who provided us with cameras, bait and bird feeders so that we could see how quickly dormice could be attracted to the feeders and whether we could use a failure to detect dormice as evidence that they were not present at a site.

We soon found that it was a bit tricky to find places where we could reliably hang the feeders exactly in front of the camera and to focus accurately on them. Designing our own frame helped with the first problem and meant that, provided we could find a roughly vertical trunk, they could be placed almost anywhere. Initially we placed the feeders about 900mm from the camera which provided acceptable focussing but was a bit unwieldy, so we reduced this to 600mm. This worked well with feeders that were up to 150mm high, though taller ones had to be carefully positioned. Some of the cameras came with screw-in supplementary lenses for close focussing. For others we cobbled up make-shift monacles, using lenses from reading glasses which we bought over the counter at a local chemist. We also reduced the output of the infrared flash with masking tape because even at its lowest setting it was too bright for close-ups.

We were conscious that bird feeders can attract birds as well as rodents, and will

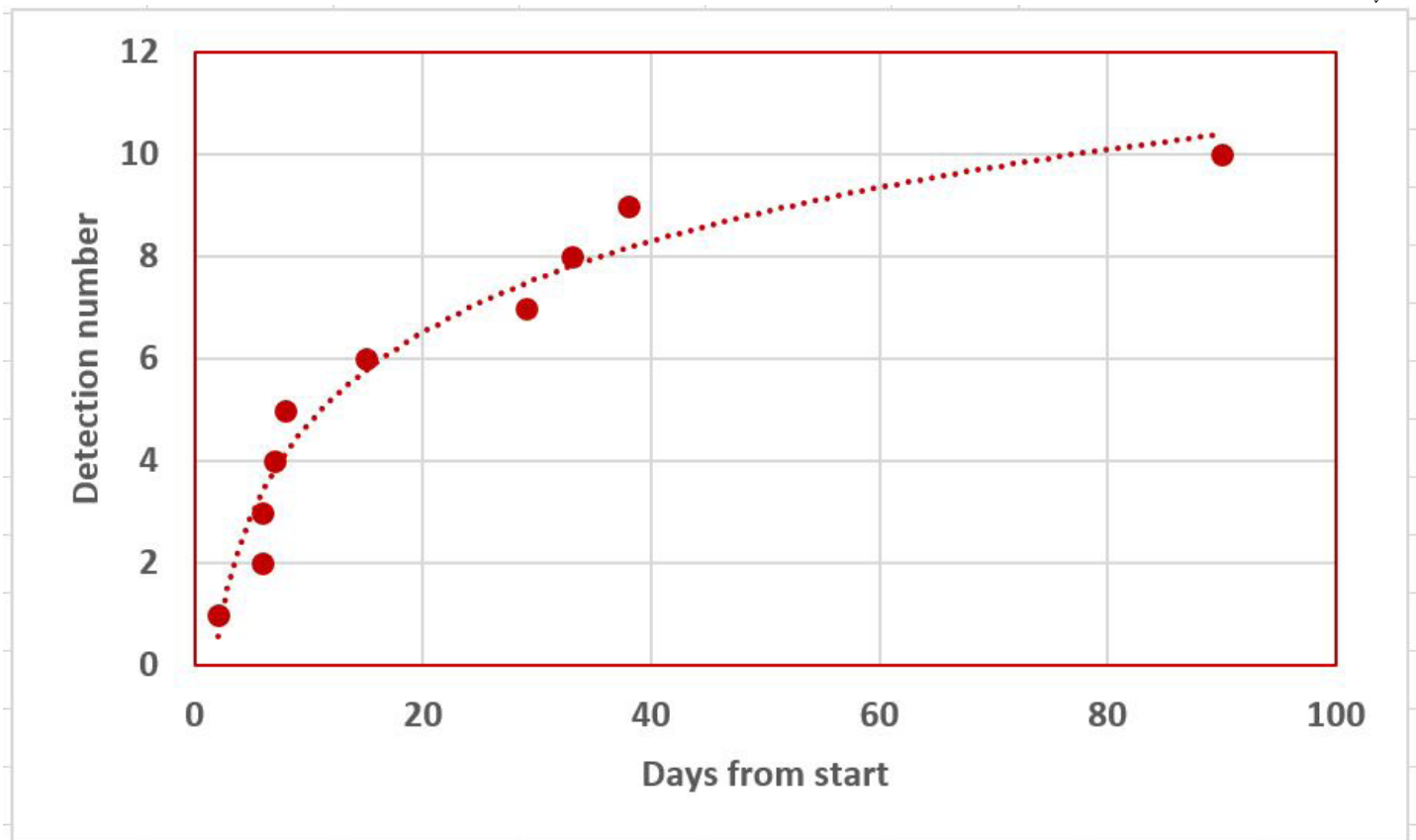
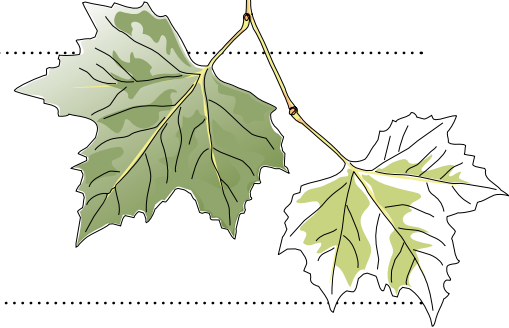
very quickly deplete the bait, requiring frequent visits to top up. Quite an arduous requirement over periods of several months. We overcame this problem by inserting short lengths of drainpipe into the feeders so that the last few centimetres could not be reached, in the hope that the rodents would continue to be attracted by the smell. This enabled us to make fortnightly visits to check for pictures and top up the sunflower kernels we used as bait.

We placed five cameras in groups, spaced about 20m apart, in five different sites over two years. Every two months we moved them to sample a different part of the woodland which was far enough away to be outside the normal home range of a dormouse. We called these 'locations' when we analysed our results.

Initially cameras were set to record throughout the day, but it soon became clear that we were very unlikely to record a dormouse then but had huge numbers of pictures of birds. Cameras were



ALL IMAGES: Paul Chanin & Tom Gray



LEFT: Frame installed in woodland with security cable. Dowel is 650mm long and 25mm in diameter. Upright is approximately 650mm x 75mm x 50mm.

ABOVE: Time to first detection of dormice in each of ten locations (from 6 sites).

subsequently set to run from dawn to dusk.

We used two types of camera but found that one of these was much more effective than the other, being triggered seven times more often. For the second year we only used the more successful Bushnell NatureView cameras which had the added advantage of coming with screw-in close-up lenses. We also had problems with the cable locks used to secure the cameras. In a couple of cases, these rusted up and had to be cut before we could move the cameras. After that we used heavy duty cable ties which were not as secure and resulted in the loss of two cameras in private woodland.

Altogether we recorded nearly 200,000 images – a formidable task to check! It was certainly best to check them a few thousand at a time when we replaced the memory cards. This had the added benefit of providing positive feedback and encouragement each time we found a picture of a dormouse.

Most of the small rodents we recorded were woodmice with the occasional bank vole or dormouse. We therefore had to learn to quickly recognise a potential dormouse as we clicked our way, relentlessly, through a few thousand images at a time. Often, the image was very clear, but many were not, you could only see part of the animal or it was blurred because it was moving. One of the benefits of taking three images at a time is that there is a better chance of one being good enough for a firm identification. We found that the key characters for recognising dormice were:

- The coat of is noticeably paler;
- Smaller eyes and ears;
- Bushy tail – but beware of blurring caused by movement; similar in length to a wood mouse but much longer than a bank vole;
- Orientation, woodmice were almost always tail down, head up; dormice could be at any angle, even upside down.

Treating each location on a site as a separate sample, our median time to detection was 11.5 days, very similar to Cheryl's results. The first dormouse we found was recorded by one of the less sensitive cameras after only 6 days. By contrast at another site we did not record a

dormouse until 20 weeks after starting.

Our sample sizes are very small, and we also noticed that after dormice had been detected at one camera at a location, they quite often turned up at others nearby within a day or two. Consequently, we were not able to carry out any sophisticated analyses or to decide how long we would need to leave cameras up before we could conclude that dormice were absent.

Nevertheless, at the 10 locations where we detected dormice (out of a possible 18) we were able to do so at all but one in less than 40 days and within 15 days at six of them.

However, in the year following our study, colleagues at WSP, were unable to repeat our success when they tried the technique elsewhere. One of their sites is in the NDMP so we know that dormice are present. The cameras were located away from the nest boxes and five were used for a period of three months. Nest tubes at the same location also failed to record dormice.

We mainly used still photographs because it takes much longer to check whether there is a dormouse on a 10 second video sequence than on a still image and they fill up the cards much more rapidly. On a few occasions we set a camera in hybrid mode so that it would take three



photographs followed by a video. On one occasion we set up a separate camera alongside the frame to see how well the rodents navigated the dowel.

From these we obtained some behavioural observations, including the fact that both dormice and woodmice could run along the dowel very nimbly. The separate camera also recorded a dormouse running along the dowel to the feeder followed, almost immediately, by a wood mouse running back towards the tree. Another time a series of photographs showed a wood mouse feeding alongside the dormouse for a short period, before the dormouse left the feeder. Evidently the idea that dormice are always dominated by woodmice is not necessarily true.

We also obtained a sequence of three photographs showing a dormouse avoiding running along the dowel by leaping onto the feeder from an adjacent branch.

Another benefit of putting cameras out in woodland for a long period of time is that you inevitably record other species in the background. Deer, squirrels and foxes were regularly captured badgers more rarely. We also recorded tawny owls on a couple of occasions.

We concluded that camera traps are quite a good way of detecting dormice. The main obstacles are expense and security but if you have a few camera traps and are prepared to leave them out with a bird feeder for a few months, the chances of detecting dormice, if present, are quite good. Unfortunately for consultants, we cannot be confident that not detecting dormice means that they are not present. Used in combination with other methods, such as nest tubes, they may have a useful role to play where an early result would be useful or where it is not possible to put out enough tubes to have confidence in a negative result and a combination of methods has to be used.

If you would like to read our report on this project and read practical advice on frame construction and camera settings, you will find them at: [www.chaninweb.co.uk/resources/cameratrapping.pdf](http://www.chaninweb.co.uk/resources/cameratrapping.pdf).





0:01:31



FAR LEFT: An athletic dormouse demonstrating its flexible ankles and characteristic busy tail.

LEFT: An actual encounter. On this occasion, the dormouse left the scene.

**Bushnell** Camera Name1019.3mb↑ 11°C 09-08-2014 23:28:47



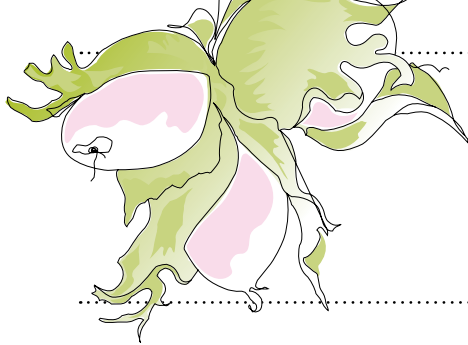
2:04:17



FAR LEFT: Composite picture showing the lighter colour of dormouse fur compared to the woodmouse. This dormouse is a juvenile and its tail is not very bushy but, unlike woodmice, is shorter than the animal's body

LEFT: The head down posture is often seen in dormice but not in woodmice

**Bushnell** Arup\_07 48°F8°C 06-30-2015 01:15:16



# Dormice return to another woodland in England, but can reintroductions really reverse their decline?

Kay Haw, Warwickshire Wildlife Trust, and Ian White, PTES, explain how releasing captive-bred populations of hazel dormice can kick-start conservation in an area.

Due to loss of hedges and coppice woods, from 1885 the hazel dormouse has been pushed to extinction in 17 English counties. Recently, individuals of this now rare species have been reintroduced, but can they really make a comeback?

Hazel dormice are charismatic rodents and endangered members of the UK's fauna. Although they are similar in size to wood mice their long fluffy tails are quite different, and their gold-furred bodies have been getting progressively smaller over the years. Their name originates from the French/Spanish verb 'dormir' meaning to sleep, as they spend colder months hibernating in nests (generally October to April).

They are one of the smaller UK mammals, with an adult body length of 6.5-8 cm and weight of 20-35g (being heaviest when fattening up just before

hibernation). In the wild they can live up to five years and typically have just one litter a year in July or August. Litters average four young that are born in a woven nest of grass and bark (or manmade from wood), and are weaned after a month.

PTES' National Dormouse Monitoring Programme has been running for over 25 years. Hundreds of trained monitors collect records from monitoring sites in England and Wales. In 2017, 6,182 dormice were recorded across 414 different sites. As dormice are hard to detect, they are also working with Suffolk Wildlife Trust to trial a new monitoring method using footprint tunnels, rather than the usual nest box and tube surveys, and nut searches.

Despite their nocturnal and arboreal natures, these once called 'common' dormice were well documented and observed across the country. Coppice

workers would often find dormice hibernating on the ground when they cut hazel coppice, but this type of management almost died out and far fewer people spend such lengths of time in woods today. There has also been a severe decline in dormice numbers.

PTES collated its monitoring results in The State of Britain's Dormice 2016 report, which showed a population loss of a third of hazel dormice since 2000 and which related to a 55% over 25 years. In the UK today they are now mostly restricted to southern England and Wales. Woodland habitat loss and fragmentation, the demise of coppice management and grubbing out of hedgerows are key factors in their decline.

Since 1993, PTES' annual reintroduction programme has released over 900 dormice into 22 woods across 12 English counties where they once lived and roamed, including Bedfordshire in 2001, Nottinghamshire 2013-2015 and Suffolk 2001 and 2006.

Key to the success of the project is ensuring the woods they are released into are appropriately and actively managed, including reviving coppice rotations as dormice favour the successional stage of woody vegetation. The programme also works with landowners to restore dormouse-friendly hedgerows that act as corridors between woods and provide food, such as hazelnuts, blackberries and sloes, and the flowers of hawthorn and honeysuckle.

Returning dormice to Warwickshire

This year saw the second phase of a landscape project that began in Warwickshire last year, in partnership with Warwickshire Wildlife Trust, Natural England, Zoological Society of London, Paignton Zoo and the



Common Dormouse Captive Breeders Group. It is hoped individuals from this second phase can connect to those released in another wood last year, through work with surrounding landowners to restore and create hedgerows to link the two.

In 2017, 20 breeding pairs were introduced to a secret woodland location in Warwickshire, then a further 20 into another wood in 2018. The woods are 1km apart and 2km from the location of the last natural dormouse population in the county. All 40 individuals have been PIT (passive integrated transponder) tagged and were initially kept in soft-release cages, being fed twice a day for ten days, which were left open to allow their dispersal.

Chris Redstall, Warwickshire Wildlife Trust's Dunsmore Living Landscape Scheme Manager, says: "This year's woodland has been chosen as it is well-managed with a mixture of mature and coppiced woodland, which is the perfect habitat for hazel dormice. This, combined with ongoing sympathetic woodland management and a drive to improve surrounding hedgerow links, should help ensure the successful establishment of this new population. All the dormice released, as well as any future offspring, will be carefully

monitored to see how they are faring."

In each wood 300 nest boxes are located in ten clusters of 30, one cluster per habitat type, determined by the management regime. Ten of these will be fitted with PIT-tag readers in each wood and nest box checks will be carried out once a month, April-October. Monitoring aims to answer

### Flagship species raise awareness for widespread conservation

questions around survivability of the population, lifespan, breeding success, dispersal post-reintroduction and if there is sexual bias, habitat and nesting box preferences, and other key questions.

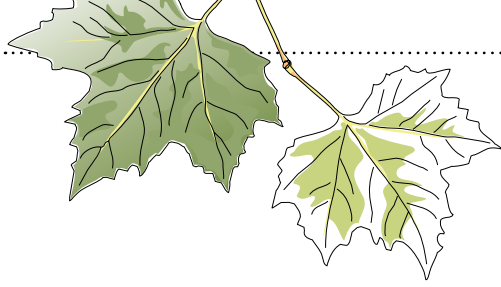
Reintroduction work has already proved to be successful at some locations, with breeding and dispersal to new areas known to have taken place. However, there have been some setbacks and losses. This occurred because the long-term management required to maintain coppicing and ride management was discontinued at a small number of private sites. As the woodland aged and shading increased the habitat became unsuitable and was

sadly unable to support the dormice. However, at the vast majority of sites positive management work has continued and populations are surviving and thriving.

Flagship species are often iconic or charismatic species used to raise awareness and support for the conservation of not only that species but also the wider habitat and biodiversity it represents. It can be easier to sell the idea of saving a visually appealing dormouse than it can be the value of restoring coppice rotations for the benefit of wider species. Yet work to save the dormouse and restore its habitat needs can provide major benefits for coppice-loving species, such as Duke of Burgundy and pearl-bordered fritillary butterflies, or hedgerow species, such as goat moth and brown hairstreak butterfly.

Here at PTES we continue to search for woods suitable for future hazel dormouse reintroductions, where the long-term management of the habitat is guaranteed to support their survival. We also need more dormouse monitors; those with dormouse licences can check nest boxes but anyone is welcome to join the annual nut hunt. More information about our dormice work can be found on our website: <https://ptes.org/campaigns/dormice/>





# Saving the Roach's mouse-tailed dormouse

Roach's dormouse is one of the least-known and rare rodent species in Europe. Nedko Nediyalkov and his team, with support from The Habitat Foundation in the Netherlands, are making it their mission to learn more about the biology and ecology of this elusive animal.

Roach's mouse-tailed dormouse (*Myomimus roachi*) is one of the most endangered and rare rodent species in a region known as the Western Palearctic (an area covering Europe, north Africa and part of the Middle East). They are only found in the western part of Turkey and southeast Bulgaria. It's possible that there are some populations in eastern Greece but no evidence has been found there yet.

Little is known about this species. In Turkey there are only a few records from a small number of sites. Until recently, despite intensive searches, no evidence of Roach's mouse-tailed dormouse was found for five years, and within the last three years just a handful of individuals have been found at three different sites. The species was first described in 1937, but only as a fossil species because no living animals were known at that time. However, by the late 1940s live individuals were found and so the dormouse could be considered an extant species. Other fossil specimens from southern

Turkey and Israel indicated that Roach's dormouse had a much larger range over the last few thousand years.

Because of its restricted range and the scarcity of recent data Roach's dormice are now listed as vulnerable in the IUCN Red List, and within Europe it qualifies as endangered, a really worrying status for an animal for such a limited distribution.

**The majority of its habitat has been converted to farmland.**

Unlike hazel dormice, Roach's dormice prefer a more open landscape, living in the hedgerows and small copses that are found along the edges of cereal and sunflowers fields and near vineyards. They tend to avoid intensively cultivated areas. It is more terrestrial than other dormice, and its diet consists for the most part of seeds.

Worryingly, during the last few decades, the vast majority of its potential habitat has been converted to intensive agriculture, and the remaining areas are severely fragmented.

It is very difficult to determine what is happening with the range because its exact habitat preferences aren't known. The region it's found in throughout European Turkey and Bulgaria is intensively cultivated, with very little natural habitat remaining. Changes in landscape use threaten the habitats. Nedko Nediyalkov and his team are working quickly to learn more about these animals so that they can put conservation measures in place to protect them. They will collect critical data about their habitat requirements, biology and distribution. With this information they'll be able to put conservation strategies in place to help protect them.

In the summer of 2017, the first mouse-tailed dormouse was captured in Bulgaria for 40 years. It was caught in the Sakar





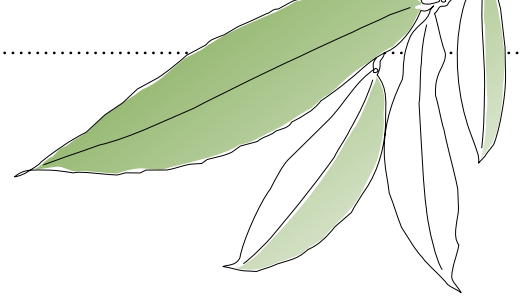
Roach's mouse-tailed dormice (above) are only known to exist at a handful of sites in Bulgaria and Turkey. They are now found in hedgerows and trees within open landscapes (below).

mountains, in semi-open grassland area with shrubs, scattered old oak and pear trees. In the neighbouring Turkish region, the species occurs in similar habitats. Nedko suspects that these are their preferred habitats, rather than the arable land where it was captured in the 1960s.

The team are undertaking their field work in two mountain ranges, Sakar and the Eastern Rhodopes. Within these two areas, the team are checking any potentially good habitats based on latest information. These will be areas very similar to those where the species was recently caught or where it was found in owl pellets. At the moment nothing is known about their daily and seasonal activity patterns, their population numbers, their diet and potential threats. Nedko will put up wooden dormouse boxes, similar to those used for hazel dormice, as well as nest tubes, woodcrete boxes (like the ones used for bats in the UK) and trial camera traps. They know that where boxes have been put up in northwest Turkey, Roach's mouse-tailed dormice have already been using them, even to breed in. The plan is to monitor the boxes throughout the year, twice a month. By intensively studying the populations, they hope to gain a good understanding of how the species behaves, and what their needs are.

In addition to the boxes, Nedko hopes to live trap some dormice too. Live trapping individuals and then marking them, will help gather more detailed information. Finding the same animal in subsequent checks means that their life expectancy can be better understood, as well how far individuals move and how different





individuals interact with others.

The other benefit of using nest boxes to study the population is that the team will be providing artificial nesting places. Although this can superficially inflate a population in some instances, within these study areas the boxes will be providing much-needed nesting sites in a landscape where there are fewer than there used to be.

Roach's mouse-tailed dormice are included in the Bern Convention and Annex 2 and 4 of the Habitat Directive, with officially 90% of the expected localities in Bulgaria being within NATURA2000 areas. This means that authorities are obliged to preserve the species and ensure that it has a favourable conservation status. But at the moment the dormice and their habitat don't get the protection they need. Therefore, the team will also engage the authorities, local landowners and land managers about their obligation to the species, and also to trigger their emotions and make them proud to help secure a future for this unique and adorable rodent that is endemic to their region.

The team has already started their work investigating this mysterious species. With help from the Milvus Group Romania, the

Dutch Mammal Society, Technical University Braunschweig, Germany, and The Habitat Foundation, the first careful searches were undertaken in the Svilengrad region, Bulgaria. Unfortunately, so far, no animals have been caught or seen in the region. During the last week of June, another five days were spent in the field, trapping in the Eastern Rhodopes region of Bulgaria. The same fieldwork was repeated in the last weeks of July. However, the weather was

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### The nest boxes will also provide artificial nest sites for the dormice

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rather wet for the region and no dormice were caught or seen, which may say something about its periods of activity or non-activity. A few other animals were caught including forest dormice (*Dryomys nitedula*), yellow-necked mice (*Apodemus flavicollis*), bicoloured white-toothed shrews (*Crocidura leucodon*), and Macedonian house mice (*Mus macedonicus*).

Further field research was undertaken in

August for ten days in suitable, but different, habitats. This time both edible dormice (*Glis glis*) and forest dormice (*Dryomys nitedula*) were caught, but still no evidence of the Roach's mouse-tailed dormice.

Nedko and the team have spent the latter part of the summer scouting the region for potentially suitable sites in which to look next. With support from PTES, a further 100 nest boxes were purchased from a local carpenter to put up in the new areas. When the team have more results, they will report back. It's exciting to be working on such a little-known species. Any new information will help us understand the Roach's mouse-tailed dormouse which will, in turn, help protect the species and its habitat from any further loss in the future.

Zsolt Hegyeli (left) and Nedko Nedyalkov (right) putting up nest boxes in Svilengrad, Bulgaria.





# Remembering those who spent their time helping our hazel dormice

Doug Woods' pioneering work with wooden nest boxes enabled us to find and study hazel dormice more easily than any other small mammal in the UK. Dora Clarke was also passionate about hazel dormice. We pay tribute to them both.

Doug Woods is known to many of us in the dormouse world. He had the innovative idea of making wooden nest boxes with an entrance hole facing where the box would be attached to a owards the tree trunk,. He reasoned that if dormice could easily enter nest boxes, which replicate natural tree cavities, then we would be able to find dormice regularly and study them. As we all know, he was right. Thanks to Doug's idea we now survey thousands of boxes every year and have a good understanding of hazel dormouse biology and ecoloty.

Sadly Doug died some years ago in 2003. However we are delighted to report that this year he was recognised by the

scientific community. His obituary was published in *Folia Zoologica*, an ecological journal published by the Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic. It is fitting that Doug's work has been acknowledged, alongside other leaders in the dormouse world Rod Baxter, Peter Vogel and Gerhard Storch, whose work on dormice in Europe and Africa have also revealed many insights.

We would also like to pay tribute to our long-standing dormouse monitor and contributor to the Dormouse Monitor, Dora Clarke. (below right, celerating her 80th birthday at a dormouse box check). Dora and her husband volunteered at Midger

Wood, owned by the Gloucestershire Wildlife Trust. Dora was an excellent amateur naturalist, an enthusiastic ambassador for dormouse conservation, who trained and inspired many younger conservationists. She will be sadly missed.

Pat Morris & Sally Paterson





# Hazel dormice in lace

Ruth Moffat, Warwickshire Dormouse Conservation Group, describes how a past hobby has been revitalised and inspired by her passion for wildlife.

I began to make lace in 1980 and it continued to be one of my hobbies for more than ten years. I made the lace in Banbury where I was taught the basic Torchon method, also known as beggar's lace. Then I learned Bedfordshire and Buckinghamshire and finally Honiton lace, the style I preferred and continued with! As this type of lace is more flexible it gave me the opportunity to depict my wildlife interests in various motifs. My first was a barn owl. I had helped establish a pair in the wild, whose descendants are still there. Next followed a great crested newt, another species I'm interested in, having surveyed our fifty parish ponds for them. (We found them in at least half of the ponds we looked in). I suspect it's the only lace newt in the world!

Twenty-seven years after moving to Warwick and, with time on my hands, I decided to return to lace making. Having run the Warwickshire Dormouse Conservation Group (WDCG) since 2009 (sadly we've found no new sites during that time), the obvious motif to try next was a hazel dormouse. I couldn't find an actual lace 'pricking' of a dormouse, so my husband suggested I use the WDGP logo. This offered more opportunity for creating a pattern than the usual 'curled in a ball'



picture of a dormouse. I enjoyed the process of making my own, working out what 'fillings' to use for the body, face and tail. Once again, I think it's likely to be the only lace dormouse in the world! It served as a revision piece for all the lace techniques I'd used in the past, which gradually came

back to me and, although far from perfect, I am thrilled with it.

The embroidered dormouse in the shape of the PTES cookie cutter is part of my 'life' sampler that took me ten years, a sort of autobiography I suppose.