spring 2011

the dormouse monitor

the newsletter of the national dormouse monitoring programme

people's trust for **endangered species**

INSIDE

Welcome

Welcome to the spring edition of *The Dormouse Monitor*. We've lots of interesting articles for you on recent and long-term research projects - both here and on the continent. Karin Lebl has collected data from five long-term studies of edible dormice in five different countries and looked at their different rates of mortality and how that was affected by whether they were breeding or not. We also have Alessio Mortelliti's report on his work assessing what impact hedgerow connectivity has on dormouse populations in the Italian landscape.

Encouragingly we also have news of several projects that are relying on the goodwill and efforts of numerous volunteers - all keen to help, especially where dormice are concerned. From Yorkshire to Cheshire, Warwickshire to Surrey, people are turning out to put up nest boxes, plant hedgerows, coppice woodlands and carry out box checks throughout the year.

We hope you enjoy this edition of the monitor - don't forget to look on the back page for details of training courses and other news - especially this year's International Dormouse Conference in Saxony.

Best regards

Nida Al Fulaij
& Susan Sharafi

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Yorkshire dormouse release update

It's now six years since 62 dormice were reintroduced into woodland near West Tanfield and an extremely dedicated group of volunteers has been monitoring the progress of the project. Almost 400 dormouse boxes are checked three times each year and, although dormouse numbers declined over the first couple of years, they then seemed to stabilise, albeit at a fairly low level.

During 2007 we found eight dormice in the boxes, seven in 2008 and nine in 2009. Although this may seem low, all the dormice have been in good health and we know that breeding has occurred, as the odd litter of young dormice has been recorded. In addition fairly good numbers of distinctive dormouse nests have been found in the boxes each summer. This leads us to hope that the dormouse population in the woods is doing okay and that they are using natural nest sites as well as the boxes. Some of the original boxes became a bit old, damp and squirrel-nibbled, so PTES kindly provided some new ones.

In 2010 we found a total of nine dormice in the nest boxes. Three dormice were found in June, two of which were fat, healthy females – hopefully ready to breed. In August we found two young dormice at two different locations in the woods, so possibly evidence of a couple of successful litters, but neither of them from anywhere near where the females had been found in June. Finally, in the October box check we found one large female dormouse, two well-grown youngsters and, unfortunately, a dead juvenile in a nest. The dead juvenile was found in the same box that had been used by a large female dormouse in June so we hope the dead juvenile's siblings survived and were elsewhere in the woods. Two of the October dormice were torpid, which was not unexpected as the previous night had been very cold. In addition to the dormice themselves, we recorded 15 dormouse nests in the boxes in June, 12 in August and 23 in October - further evidence of a population out in the woods.

The dormouse tubes which were placed in the hedges to the west of Heslett Wood in spring 2009 were also checked in October, but had no evidence of dormouse activity. However, two of the tubes were being used by roosting small birds, judging by the piles of bird droppings we found. We are hoping to put some more tubes along other hedges radiating out from the woods in 2011.

Other mammal records from the woods at West Tanfield in 2010 include roe deer, brown hare, wood mouse, common shrew and pygmy shrew. The strangest object we found in a box was a large, old bone (possibly mammalian). We have no idea how or why the bone ended up there as it was too large to have been carried up by a small mammal. Strange things happen down in the woods…

All that remains is to thank everyone who helped with the dormouse monitoring, especially the dedicated volunteers who turn out for every box check, whatever the weather. If you'd like to help please call 0113 2811286 or email ann.hanson@fwag.org.uk.

Ann Hanson
FWAG

Tribute to Jonathan Woods

Michael Woods' son, Jonathan, died tragically in a climbing accident this March.

Since an early age Jonathan was a committed naturalist and passionate about the conservation of wildlife, in particular British mammals. Growing up with both Mike and Doug Woods around it was almost impossible for him to not become heavily involved with dormice and dormouse conservation, though Jonathan also found the time to become highly knowledgeable about badgers and a licensed bat surveyor and handler.

He developed that passion into his profession when he joined his father at Michael Woods Associates. In 2009 Jonathan, assisted by friends and colleagues, took over the management of the business from Michael. Since that point the business has gone from strength to strength, in no small part due to the enthusiasm and energy that Jonathan was able to add, not to mention his technical expertise in all things mammal!

Jonathan tragically died whilst climbing in Pembrokeshire. Climbing was another great passion of his and something that, just like his profession, he approached with great positivity, immense enthusiasm, and considerable skill. He will be sorely missed by everyone who had the fortune to know him.

Tom Clarkson
Michael Woods Associates

Edge Wood study of dormice

Edge Wood, in Shropshire, is part of Wolverton Wood and Alcaston SSSI. This 10ha wood is managed as coppice with standards. We decided to put nest tubes up in the newly coppiced coupes to see how quickly the dormice would begin to use these areas and therefore help guide the overall management of the wood. Currently the small coupes within the wood are coppiced every eight years which provides material for green wood and coppice products. There are also some parts of the wood which are neglected hazel coppice and beech plantation which will gradually be bought under management in the future too.

Our main aim was to find out if, and how soon, dormice would begin to use patches of wood that had been coppiced. If they did we wanted to also try and find out which bits they seemed to prefer and why.

The wood has 11 coppice coupes throughout it and in early June 2010 we hung 97 nest tubes up in seven of the coupes. The tubes were placed under branches which had good aerial connectivity to adjacent saplings and shrubs. They were mainly hazel but we also put tubes up on holly, ash, willow, honeysuckle, bramble, wych elm and oak. The four coupes that weren't surveyed had either been coppiced too recently to have any shrub to attach the nest tubes to, were due for coppice the next winter or had very little shrub under a beech dominated canopy.

Two coupes of five and six year old coppice (coupes 1 and 2) both contained dense undergrowth consisting of coppice shoots, saplings and bramble, with an abundant food supply of blackberries, Guelder rose berries and hazel nuts. Coupe 3 (also five year old coppice) had a great range of shrub species including maple, oak, ash, holly, silver birch, bramble and hazel. In contrast the two coupes that hadn't been managed for some time (coupes 6b and 7) had a dense canopy, with over-shadowed shrubs producing little fruit.

Dormouse in nest tube in coupe 1 (5-6 year old coppice) on 30 October.

Our results showed that 23 tubes out of the 97 were used – an almost 25% occupancy rate. In July, we found three dormouse nests, in September a further eight tubes had nests in them and by October a further 12 tubes had nests. We found the greatest activity in the six year old coppice, followed by the five year old coppice. The two unmanaged sections had the lowest amounts of nests recorded – one per coupe in October. The most recently coppiced section of the wood had a fairly low occupancy rate: only two nests were found in 15 tubes. Unsurprisingly in coupe 9 (which had not been managed recently but had a significant amount of woodland edge habitat) we found slightly more nests than in the more overgrown sections of the wood.

Edge Wood is an important site for dormice and the population appears to be healthy, judging from the numbers of nest tubes that were used in this survey. This work has clearly demonstrated the value of coppice management, with much greater and prolonged use of coppiced coupes apparent, at least in the summer and autumn, than in neglected coppice areas.

Kate Thorne and Robert Thorne, Churton Ecology

Nest tube (occupied in July) on pendant ash branch in coupe 4 (3-4 year old coppice).

Unoccupied nest in coupe 3 (4-5 year old coppice) near fruiting holly on 30 October.

The map shows the woodland coupes and the number of tubes put up and used by dormice.

ALL IMAGES KATE THORNE

A long-term study of edible dormice, Bucks

Introduced to Britain in 1902, the edible dormouse hasn't spread more than about 20km from its original release site due to the constraints of the surrounding open farmland. Locally, however, it has become a significant nuisance in the Chilterns. We decided to monitor the population in the mid 1990s using the same technique that had proved so successful with hazel dormice. We erected wooden nest boxes on trees in a grid throughout Hockeridge Wood, Buckinghamshire. The wood consists mostly of beech trees, reflecting the habitat edible dormice are usually found in across Europe. There are also various deciduous and softwood species such as spruce and Scot's pine.

A total of 110 larger wooden boxes were put up in trees, 3m above ground, in an area about 20-25ha. We set up a monitoring programme, checking the nest boxes once a month from May to November every year. The results in this article are based on the data we gathered between 1996 and 2008. During this time 1,145 animals were tagged, of which almost half were caught again during the monitoring period.

People have reported seeing edible dormice in their homes as early as April but we rarely found them in the nest boxes until June, sometimes May. The edible dormice don't use nest boxes to hibernate in and so, by November, very few were present. This suggests that they have an active period of about five months here in the UK (with seven months in hibernation), as in Continental Europe, and reflected in their German name Siebenschlafer ('seven sleeper'). This pattern of activity is similar to the hazel dormouse, which we also tend to find in the boxes from May onwards, with higher numbers later in the season – though the numbers for *Muscardinus* seem to peak in October in the boxes rather than September.

Edible dormice only breed in years when there is a high availability of food, particularly beech mast. A similar phenomenon has been reported between breeding success and beech mast crops in Germany and Italy. Somehow the animals detect an environmental cue at a large-scale level and that in turn influences whether or not they breed that year. It seems that they are conditioned by food quality when they come out of hibernation and if the beech trees have few buds on them in early summer, the dormice do not come into breeding condition. This makes sense in that a lack of buds also means that there will be a shortage of beech mast later in the year and that the juveniles will not have enough food to fatten up sufficiently to survive hibernation.

So, unlike the hazel dormouse, the edible dormouse doesn't breed every year. And it appears the edible dormouse uses the nest boxes predominantly for breeding. Consequently, throughout our study, we had some individual animals that we didn't pick up in a season and were sometimes absent for as many as three years before we found them again. During masting years only 5% of the animals known to be alive were absent for the whole season, but up to 90% were absent in non-masting years. Where had they been? We aren't sure but it is possible that the dormice were living in nearby houses since in 2001 and 2004 - when there was a failure of both masting and breeding - more than 400 animals were taken by pest control officers in contrast with 2002, when there was a conspicuous mast crop, successful breeding and less than 10 animals removed from local houses.


DAVID SHUTE

Hazel dormice have an average of four to five young per litter. In contrast we found throughout the study that the litter sizes of edible dormice varied enormously between one and sixteen. It may be, though, that some of the larger litters were in fact crèches of young from different females, as quite often the young seemed to be two different sizes and at times there were two adult females present. What advantage they get from forming these crèches and how the females cope with larger numbers of young however is still unknown.

For a relatively small animal, the edible dormouse has a surprisingly long life on average. By micro-chipping the animals we were able to determine the rough age of the dormice that we recaptured. Of the 426 animals that were recaptured at least once there was a high survival rate afterwards and on average 60% survived each year up to eight years. So at least 12 animals that we recaptured had lived for at least eight years, including two that were more than nine years old when last seen.

Our long-term study at Hockeridge Wood has confirmed that forming crèches, cohabiting, and using the same nest boxes year on year all appear to be normal behaviour in this species. It appears that edible dormice compensate for the fact that they have only one litter a year, and fail to breed every year, by having an extraordinarily long life span for such a small mammal. This, combined with their extremely short active season and long periods of hibernation, make it a unique creature.

Pat and Mary Morris

Morris, P. & Morris, M. 2011 A long-term study of the edible dormouse in Britain. *British Wildlife*. 22. 153-161.

Haslemere hedgerow project

Surrey Dormouse Group (SDG) has recently been working in partnership with PTES at a site near Haslemere in Surrey, to reconnect two areas of ancient and ancient replanted woodland respectively called Hurthill Copse and Holmen's Grove, for the benefit of dormice. Desktop research of historical maps, carried out by myself and Andy Cross, showed that the two areas of woodland were once connected by a strong network of hedgerows and tree lines that had long since been removed. However their alignments can still be seen as field marks on modern aerial photographs, and match surprisingly well to the old maps.

Dormice are known to be present in good numbers in Holmen's Grove, where SDG regularly monitors them as part of the NDMP. We think that they are also still living in Hurthill Copse, which is good habitat, and are definitely present nearby, further to the west. Dormice are of course largely arboreal, moving through the branches of trees and shrubs to avoid predators. Radio-tracking experiments in the 90s, and more recent work, have shown that whilst dormice are capable of crossing open ground, large gaps in hedges and other open expanses nonetheless present a hindrance to their dispersal and dissuade them from moving about freely to exploit food sources and reach sites for breeding and hibernation. This also potentially reduces gene flow and causes isolated populations to become inbred.

Due to the loss of the historical hedgerows the woodland areas we are working on are now located on either side of a large open arable field. These are joined only by a single tenuous field boundary at the southern end, this comprising of a defunct hedgerow link that is becoming gappy with a low bank of bracken and brambles along one section, and a thin tree line along the other. Whilst dormice do use such features, they are unlikely to be sufficiently biodiverse to provide the seasonal succession of different food sources generally accepted as being beneficial for them. They are most valuable as component parts of a more structurally and biologically diverse arboreal habitat. The bank concerned also grows low to the ground and is not very wide, features which don't encourage use by dormice.

Jim Jones of PTES has been running the *Hedgerows for Dormice* project, which aims to identify opportunities for reconnecting fragmented areas of key dormouse habitat. Fortunately for the dormice, when PTES and SDG began discussions with the owners of the remaining hedgerow, it transpired that they were sympathetic to their plight and keen to help. Having surveyed the remaining field boundary using nest tubes, dormice were found in the tree line, but not in the defunct gappy boundary.

With the agreement of the landowner, we were able to get work parties out before spring to strip back and then substantially enhance the connecting hedgerow by planting native tree and shrub species. In time, it is hoped that this planting will develop and create a much stronger habitat corridor between the two woodlands. The increased connectivity between the two woodlands should help to improve gene flow between the populations of dormice living in them, reducing the chance of inbreeding and making them less vulnerable to stochastic events that might cause localised extinction.

Ben Kite
Surrey Dormouse Group


PTES

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Warwickshire Dormouse Conservation Group

The Warwickshire Dormouse Conservation Group (WDCG) was created in December 2009 to support the objectives of our dormouse LBAP, including finding out if we have more sites than the one known natural population at Weston Wood and the reintroduction site. Since then the group has grown to an impressive 41 members plus 25 'friends' who receive our quarterly newsletters without being harassed for help with fieldwork! We are also supported by Warwickshire County Council's Biological Records Centre.

Out first meeting in January 2010 was to relocate 100 nest boxes in preparation for the introduction of a second batch of dormice by PTES at Windmill Naps, following the initial release in 2009. This second release took place in June 2010, followed by frequent feeding visits until September, which got us several new members as the presence of hornets necessitated paired fieldwork. The basic food mix was supplemented by mealworms, cherries, blueberries, grapes, pears and of course hazel nuts. Squirrels provided us with a challenge as they opened the doors to the wire holding cages by chewing the cable ties and even released some hinged rings we used next. We eventually foiled them with D-clips but only after we had posted up messages to the public asking them not to open the doors!

Our own fieldwork began in February with a 'recce' at various woods and hedgerows in preparation for updating the 1999 survey of Warwickshire woodlands by Natural England. This recommended that the five sites previously found to have evidence of dormice - chewed nuts - should be resurveyed but for various reasons only two of these were selected, together with another three woods, one of which had had a hibernating dormouse in 2009. A BSc student investigating the use of hedgerows by dormice selected two adjacent to Weston Wood for survey as well.

Meanwhile, back at base, 200 nest tubes were being made out of Tetra Pak cartons to supplement those bought with a grant from PTES. In early summer over 400 nest tubes were installed at the seven sites which did spoil a little the beautiful carpets of wood anemones and bluebells! With few of our members having handling licences, monthly monitoring was only possible at two of the sites and all the nest tubes were retrieved after the final check in November. Sadly we found no evidence of use by dormice at any site although the tubes were popular with wood mice and birds!

K MARTIN

ABOVE: making Tetra Pak nest tubes.
BELOW RIGHT: putting nest tubes up in the woods.
BELOW LEFT: the WDCG.

J UNDERHILL

DERRY HANRATTY

During the summer our members were not idle. In addition to feeding the new dormice, those who had not seen a dormouse assisted the FC Ranger with the monthly box checks at Weston Wood but unfortunately no dormice or nests were found.

Looking back on our first year, despite finding no new dormouse sites, the group has had its successes. Fieldwork involved 29 members in 55 visits to eight locations, which is a fantastic commitment and led to networking between people who otherwise would not have met. It has also initiated two surveys by individual members for 2011, one for an MSc degree. We plan to 'nut hunt' at the five 1999 dormouse positive sites this spring to finalise our updating of the NE report.

Ruth Moffatt
rmof22@yahoo.co.uk

First dormouse release Hailey Wood, Hertfo

In 1981 whilst I was working as an animal keeper in Cameron Loch Lomond Wildlife Park in Scotland, I made a decision to breed rare British animals and attempt to reintroduce them into safe, selected habitats. The following year, when I moved south to work at Chessington Zoo, I obtained my first three dormice, trapped under licence for me by Owen Newman, a wildlife cameraman working for the BBC. I managed and added to the captive stock until I had 97 animals by 1991. By now we were living at Windsor Safari Park where veterinary help and advice was generously given by Dr. John Lewis.

As originally intended there were now enough animals to carry out a reintroduction. The site (Hailey Wood) that was chosen was a seven hectare oak and hornbeam wood with a diversity of other plants and a species rich shrubby undergrowth. A thick hedge also led from the wood into a huge expanse of woodland where in time, we hoped, the dormice would migrate.

My captive-bred colony of dormice at Windsor was housed in a long wooden building divided into eight compartments, each housing a male and a female, or two females and one male, depending on the perceived personality of the animals. Each of the compartments led out into a large outdoor run which was planted up and contained branches for the animals to scamper along.

The animals chosen for the release consisted of two family groups. The first contained two adult females, with two newly emerged juveniles; the second an adult male and a female with five newly emerged juveniles. I felt that it was important that the juveniles were used due to the learning that takes place in their early days. The animals were prepared by being given branches to feed on from the plants that they would find in the Hertfordshire wood where they were going to be released. The animals were then quarantined using strict hygiene procedures which included always feeding these two groups first to prevent contamination from the other animals. Each of the animals was then physically checked by the vet before being confirmed fit for release.

A release cage was built in the chosen wood, measuring 3 x 3.5 x 2m, over growing vegetation, with two feeding shelves placed on either side of the cage. Over each shelf we created a feeding hatch, through which we could put fresh food and remove the old remains. Then on 28 August 1992 the two family groups were taken, in their nest boxes, to the site and the boxes fixed on

DORMOUSE RELEASE PROTOCOLS:
Since 1992 17 captive-bred populations of dormice have been released across the Midlands and the north of England. The methodology has been refined and the following guidelines are used to give the dormice the greatest chance possible:

- woods of at least 20ha are chosen to ensure a viable population will survive in the long-term
- 40+ dormice are health-screened
- a minimum of 30 animals are released to account for losses of captive-bred animals that have a lower survival rate than wild ones
- animals are taken to the release site in June in the hope that the pairs breed in time for their young to fatten up before the winter hibernation
- dormice are paired up and put into 15 release cages, throughout the wood
- animals are microchipped so in the following years individual survival can be monitored.

JOHN WEBLEY

rdshire, 1992

opposite sides of the cage. Lights had been fitted to the top of the cage so that we could observe the animals' behaviour. We had help from 16 A-level students from Haileybury College, working under the guidance of Julian Ford-Robertson.

Almost four weeks later, on 23 September at 7:30pm, a hatch was opened to enable the dormice to venture out into the wild. And less than three hours later the first animal ran up a branch that had been propped on the feeding shelf out to an overhanging branch outside. It then returned almost immediately to the security of the cage but by 11.00pm all the animals had gone.

A radio-collar had been fitted to one animal and we discovered that he ranged up to 35m from the release cage. Until the collar was removed on 29 September, he had returned to the cage almost every morning and spent the day in one of the nest boxes. We continued to provide supplementary food until all the dormice had disappeared into hibernation. We monitored the animals' activity by placing nest boxes and milk cartons full of shredded paper throughout the wood. The adults disappeared quickly but we continued to find four of the youngsters until the end of October.

The next year we released a further group of dormice to increase the gene pool. And in 2010, some 18 years after the first reintroduction of hazel dormice into British woodlands, signs of dormice are still being found in Hailey Wood – our first release site. A wonderful achievement!

The year after the Haileybury reintroduction, Windsor Safari Park closed and my captive animals were transferred to Burnham Beeches, Corporation of London. In 1995 the Common Dormouse Captive Breeders Group (CDCBG) was set up and each year several dormouse breeders contribute animals for release. To date 17 reintroductions have been carried out throughout England, involving hundreds of enthusiastic volunteers. It seems, we hope, that the future of the dormouse will be safe in the hands of those who have taken over this innovative work, including PTES, the members of the CDCBG, Paignton Zoo, ZSL and the owners, volunteers and monitors in those woods across the country looking after the dormice day to day.

During the breeding project, veterinary help was given by Dr. John Lewis of International Zoo Veterinary Group Practice. Those involved in the 1992 reintroduction were Martin Hicks, (who advised on the ecology), Professor John Gurnell (who advised on the animals' behaviour), Julian Ford-Robertson and Steve Whitbred.

Dot Eaton
Project Leader

TOP: one large release cage was constructed to house two dormouse families. BOTTOM: the breeding facilities for the captive-bred dormice included inside and outside space.

BOTH IMAGES DOT EATON

Shooters are leading on a new hazel dormo

Shooters are leading on a new project in partnership with the local BAP group and PTES. On the face of it you may be wondering where the link is. Dormice are not quarry species so some cynical types might question why the British Association for Shooting and Conservation (BASC) would want to be part of a plan for them, never mind lead it. There are two reasons, the first is altruistic: shooters like to help create a landscape which is brimming with wildlife because that engagement with general nature is an important part of the enjoyment of field sports. The second is practical: the habitat that supports game and rough shooting is extremely similar to that required by dormice. It is primarily for these reasons that shooters and BASC are keen to see this mammal thrive and are well placed to help preserve it.

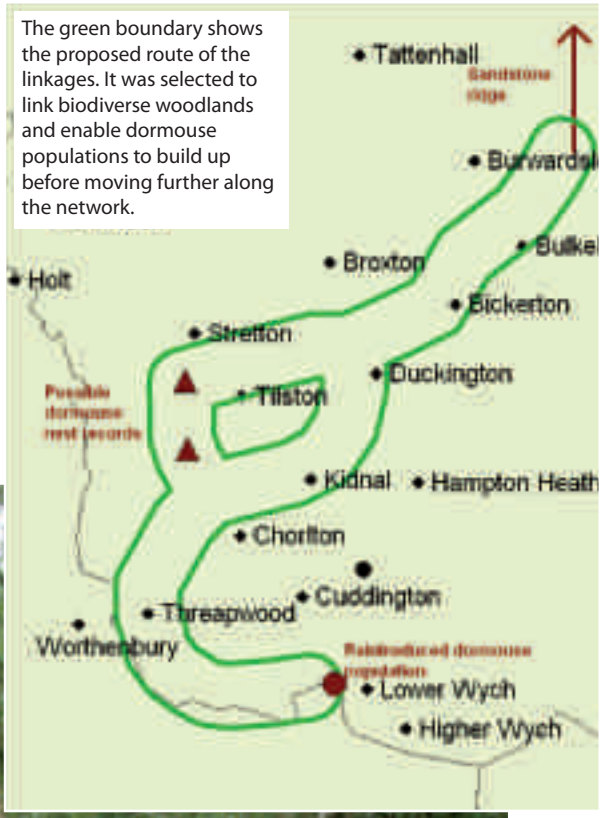
The Dormouse Conservation Handbook lists some of the benefits that shooting provides for the hazel dormouse and these include:

- the shooting season (autumn and winter) encourages late season coppicing which means dormice can fully utilise the nut crop before hibernating
- sympathetic ride management which benefits both dormice and game shooting is more likely to be found on shooting estates
- deer may be managed in some woodlands to preserve habitat in favourable condition for dormice and this is done by trained stalkers
- control of grey squirrels by shoots, to limit damage to feeders for pheasants and to decrease predation pressure on breeding woodland birds, reduces the level of food competition for dormice.

The Southwest Cheshire Dormouse Project

Dormouse distribution is strongest in the south of England and south Wales, with more sporadic populations in a rough line from north Wales and across the Midlands. In Cheshire the only confirmed dormouse population is a released population in the Wych Valley in the southwest. However BASC has found dormouse nests in two other sites nearby in recent years.

In 2010 BASC submitted a funding bid to the SITA Trust to provide a grant for a new project called the Southwest Cheshire Dormouse Project. The funding bid for £83,911 was successful and the project will link the habitat from the Wych Valley into southwest Cheshire to help dormice spread from their current location up to the sandstone ridge, which has a high connectivity of woodland and hedgerow habitats. The project contributes towards the climate change agenda too as it will provide a functioning ecological network not just for dormice but for a range of bat, other



The green boundary shows the proposed route of the linkages. It was selected to link biodiverse woodlands and enable dormouse populations to build up before moving further along the network.

Management of woods with pheasant shoots can be beneficial for dormice, for example in terms of sympathetic ride managment.

NIDA AL FULAIJ

ouse project in Cheshire

mammal, insect, fungi and plant species which require such networks to move north.

This project forms a major part of the Cheshire Dormouse Strategy, itself a product of the Cheshire local BAP of which BASC is a core member through its Green Shoots programme (www.basc.org.uk/en/conservation/green-shoots).

Sue Tatman of Cheshire Wildlife Trust and Ben Gregory of BASC have been working together on dormouse conservation projects for several years.

MAP & IMAGES THIS PAGE BASC

Pheasants and dormice have similar preferences: lots of shrubby cover within woodlands.

The project formally started on 14 February this year. We are using the current best practice guidelines for connecting dormouse habitat and benefiting from the experience of the *Hedgerows for Dormice* project managed by PTES. This recommends establishing at least two hedgerow connections between each key woodland, both to increase the speed at which dormice colonise new woodlands and to safeguard against one route becoming defunct. As part of the bidding process we identified the routes which we will validate through surveying in the coming months.

The success of the project relies heavily upon recruiting and training local volunteers, ideally linked to the land, such as the landowner, tenant, the shooting syndicate on the land or a local group who have access to the land. These volunteers are a key part of the project's aim to leave a network of trained and motivated volunteers who will continue to manage and monitor the habitats after the project ends.

We will use trained volunteers and officer time to survey the hedgerows and woodlands along the proposed route and immediate surrounding area. This detailed data will enable the project to target work to determine the condition of existing habitat, rehabilitate damaged habitat (gapping up for example) and create habitat in the correct locations. The final route on each landholding will be agreed with the landowner and a funding mechanism identified. These will vary from private funds, the English Woodland Grant Scheme, Higher Level Stewardship, the Woodland Trust's MOREwoods scheme and a budget of £36,000 from SITA for us to use where there are no other viable options.

Creating the legacy

Each site where we agree to create a habitat linkage feature will be given a management plan to achieve and then maintain favourable conditions in the long term. We will establish a system where we get trained volunteers to adopt a linkage feature and report on its condition to BASC and the Cheshire region Biodiversity Partnership. This is vital so that we have local people who are interested in the habitat provided through the project and will look after it in the long-term. This is brought into sharp focus when you realise the dormice may take a few decades to move along the full length of the network!

Finally, we will create a network of dormouse boxes in key habitats at selected locations on the route. We will get our trained volunteers to adopt these boxes and monitor them for autumn nests at the back end of winter. They will pass their results back to BASC and the Cheshire region Biodiversity Partnership.

Finally

This is an ambitious project. We are looking to create a linked network of hedgerows some 17km long, which will have stepping stones of BAP woodland habitat to permit dormouse numbers to build up before the next trek northwards. However, with a strong partnership behind the project, including PTES, and excellent interest from local landowners and shooters we are set to be successful.

Ian Danby
BASC
Head of Biodiversity Projects

Underpasses for dormice?

I can hear the tone of incredulity as you read the title of this article: 'You cannot be serious!' However amidst all the talk of bridges for dormice I think it is well worth considering alternatives, particularly if they are cheap and easy to install.

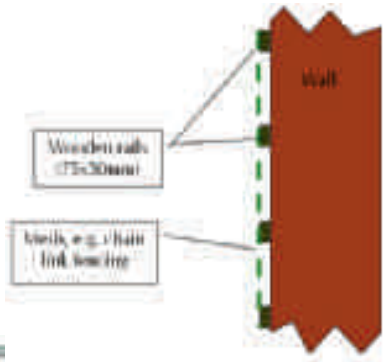
There is no question that the best way to ensure that dormouse populations on either side of a large road are not isolated from one another is to build a 'green bridge'. Ideally these should be large enough to be planted up with trees and shrubs and to allow other wildlife such as deer, foxes, badgers and hedgehogs to use them as well. We know that they work so why don't we build more of them? The answer, of course, is cost.

Various cheaper alternatives have been tried, though these too can be very expensive. A £190,000 'dormouse bridge' was recently constructed in Wales amidst quite a lot of controversy. This was over a road which I know that dormice would be willing to cross on foot - I have tracked them doing it in the southwest.

Some years ago, after discovering that dormice were living in woodland isolated by the network of roads which form the junction of the A303 and M3 in Hampshire, colleagues suggested that they might creep underneath the bridge. This certainly seems possible with bridges like the two on the right.

This led to the thought that since it is dark when dormice are active, they are not very likely to be put off going through a large tunnel if given suitable encouragement. I was also conscious that on a few occasions I had installed a dormouse nest tube, or box, on a post and rail fence. I see no reason why dormice wouldn't run along the rails beside a hedge or wood, so why not extend it under the road?

People who build and maintain roads are very reluctant to attach anything to them that is likely to get in the way, or need much maintenance. However, bolting a few rails to the wall of a minor road, pedestrian or agricultural underpass seems unlikely to cause too much consternation. My original idea was to simply extend the rails underneath the bridge (below), making sure that suitable habitat was planted as close to it as possible. I also thought that putting some wire mesh over them might help the dormice feel more protected.



PAUL CHANIN

BOTH IMAGES PAUL CHANIN

This idea was put into practice under the A30 between Bodmin and Indian Queens in Cornwall (below right). Notice that dormouse habitat has been planted up to the underpass (this one is designed for agricultural uses) linking it to existing habitat nearby. Also note the creeper used to link this with the rails. Paul Gregory recommended putting the rails higher than I originally intended which isn't likely to worry the dormice but reduces vulnerability to passing tractors, cyclists, cows etc.

As yet, we don't know whether it works...but nor do we know if rope bridges over roads work either. It is cheap, low maintenance and seems at least as likely to work as some of the other suggestions that have been made. Efforts are being made to try and detect dormice (using hair tubes) but there is a bit of a problem in that we need to allow time for the habitat on either side to develop too. This work was done under the terms of a dormouse licence and was accepted as part of a mitigation plan for construction of the road. It would be good if it could be tried in other places as well - and monitored over time. Next - flyovers for badgers!

Paul Chanin
Mammal Ecologist

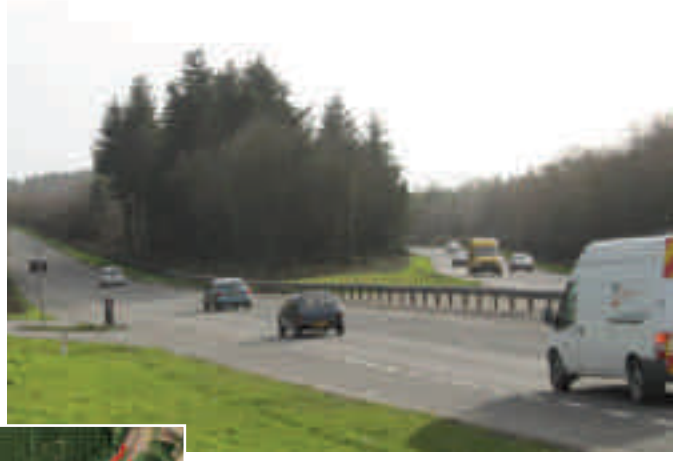
PAUL GREGORY, URS/SCOTT WILSON

Dormouse activity on the A30 in Cornwall

Despite not having the diverse structure or ecological complexity of many NDMP sites, road verges have become an important dormouse habitat in Devon and Cornwall and they are proving able to support healthy populations with densities comparable to non-roadside locations.

Large-scale planting of native species of trees and shrubs occurred in the 1980s and 90s along newly built motorways and trunk roads in England and Wales. This provided dormice today with reliable food supplies and the means to disperse through the wider landscape. As these species-rich belts of trees and shrubs, small woodland plots and scrub mature, the benefits to wildlife in general are starting to show especially at urban and semi-urban locations or alongside agricultural land. Despite the noise, vibration and intense light spillage, roadside dormice seem to respond well and animal weight and breeding patterns are comparable to other non-road NDMP sites I monitor.

In the past four years our study along the central reservation on the A30 near Bodmin in Cornwall has shown that even small fragments of road verge habitat can be used by dormice and that they successfully breed in patches smaller than one hectare surrounded by roads. The use of microchips allowed us to identify individual dormice, detect movements of recaptured animals and establish that certain individuals were able to travel across the carriageway to explore habitats at the other side (further details about this study will soon be released).



ALL IMAGES LEONARDO GUBERT

Puzzled with the information I decided to investigate another central reservation in Devon within known dormouse territory, hoping to find dormouse evidence and establish that the ability to inhabit fragmented habitats was not unique to the Bodmin population. In 2008 I found three natural nests and managed to erect 30 nest boxes in September and by the end of October I came across a few nests and three dormice, one adult and two juveniles. The presence of juveniles was encouraging as they were either local to the site, which meant that there were successful breeding attempts, or they were some of those that liked to hit the road and venture on open ground in search of a new horizon.

This new site, of around 3ha, is much bigger than the A30 central reservation and includes a mosaic of habitats. These include patches of heathland, bramble scrub, conifer plantation, semi mature deciduous trees, rank and amenity grassland, not to mention an old lime kiln inhabited by a lone traveller not too long ago when trunk roads were not as busy and access was not exclusive to those specifically trained or others with serious suicidal tendencies.

Monitoring these boxes can be noisy during the rush hour but results are great and a close encounter is guaranteed. There has been evidence of breeding and new recruits have been recorded ever since the boxes went up. In 2010, there were either dormice or nests in 26 boxes out of the 30 installed in the central reservation including Roadie, a sleepy 35g male found last October. The presence of dormice in such an unusual place caught the attention of the BBC's The One Show, which commissioned an article on the A38 dormice as part of a wildlife series called *Out of Bounds* screened on the 23 November.

Studying populations such as this one helps us understand how dormice (and other species) are making use of these man-made habitats that are literally scattered in abundance across the country. What I am trying to find out at the moment is why this central reservation along a very busy road is so popular with dormice. Is it lack of or low interspecific competition (such as with grey squirrels), lower level of predation or the fact that there is no public access? Or might it be that they are indeed islanded and reluctant to cross the road making the whole site a metapopulation sink?

The study is not so simple because of the costs and Health & Safety constraints that come with working on high speed roads. There is still a lot to find out and I will keep you updated.

Leonardo Gubert

Survival rates of hibernating *Glis glis*

One of the current central themes in the study of ecology is determining what factors explain the changes in the number of individuals in a given population. The birth, migration and mortality rates will all affect the population dynamics. Furthermore factors such as how successful individuals are at reproduction (heavily reliant on external factors like the availability of energy-rich food) will also vary between individuals within a population. Karin Lebl and her team decided to look at mortality rates in edible dormice using data collected from five different sites across Europe. By collating data from different studies she could look at what similarities and what differences occur in the variation in vital rates (in particular survival) - both temporally and spatially - in the edible dormouse; with the hope of uncovering some interesting results.

Several different factors work both individually and together to affect the mortality of edible dormice. The availability of food, predation and abiotic factors, such as climate, will all impact on the animals. Karin and her team set out to determine which factors, or which combination of them, had most impact on different populations of dormice and if this varied across their range.

Unlike other small mammals, edible dormice do not reproduce each year. They only produce litters in years where trees mast or fruit. Their breeding success is heavily reliant on the availability of foodstuffs such as beech mast and acorns, and previous studies have shown that the dormice can predict a mast year and don't reproduce in years when the trees aren't fruiting. In years when *Glis glis* are not reproducing the evidence shows that survival rates are twice as high, indicating a strong trade-off between reproduction and their own future survival. Consequently the frequency of mast seeding events affects the lifespan of the animals. For instance the German population of *Glis glis* that were studied had an average life span of over three years, whilst in northern Italy the average lifespan was nine years. The two factors Karin considered most important in affecting the mortality of the dormice in years when they were reproducing were a possible increase in predation whilst the parents were out foraging, and the likelihood of increased mortality during hibernation due to insufficient energy reserves.

Karin collated the data from five study sites in England, Germany, Italy, Austria and the Czech Republic. All the study sites are dense, semi-natural mixed forests, mostly dominated by beech, except the Czech wood which was dominated by oak. Data were collected from marking or chipping animals which were caught in wooden nest boxes placed in linear or grid systems throughout the woodlands. The number of nest boxes at the sites varied between 100 and 200, whilst the number of animals studied ranged from just over 300 to over 1300.

The results showed that there was a clear seasonal pattern in the survival rates of edible dormice. Survival was lowest for all the populations in the early summer, higher in the late summer and highest during hibernation in winter. In the years that the *Glis glis* reproduced their survival rates dropped, whilst at all study sites, in both reproductive and non-reproductive years, females had higher survival rates than males.

The high survival rates of the animals over winter whilst they are hibernating clearly shows that they rarely die from starvation due to insufficient energy reserves. Their higher mortality in early summer is likely to be due to a higher level of predation and also the fact that they have a harder time finding enough food to meet their bodies' energy demands. These factors are likely to be compounded in reproductive years and lead to higher levels of mortality in all the populations.

Although Karin and her colleagues found that the populations of edible dormice exhibited the same features in terms of when mortality was highest, they also found that there were considerable differences in

PETER GRIMSEY

the average survival rates of edible dormice, leading to differences in mean lifetime reproductive success between the populations too. For instance the lifetime reproductive success of an animal in England was calculated to be 7.6 juveniles, whilst in Germany the number of juveniles likely to survive over a female's lifetime was only 4.7, and in the Italian Alps 8.5.

Karin's results suggest that edible dormice have adapted well to maximising their chances of high lifetime reproductive success despite their reliance on habitats that have infrequent and unpredictable food sources. They also survive well during hibernation – possibly because their hibernacula are relatively secure from predators. Losing up to 30% of their body weight during hibernation, however, leads the dormice to increased periods of foraging in early summer which arguably makes them more susceptible to predation and therefore could explain their high early summer mortality rates. Interestingly the species which predominantly prey on *Glis* (such as tawny owls and Eurasian eagle owls) rear their young in early summer and have increased energetic demands during this period.

DAVID SHUTE

Lebl, K., Bieber, C., Adamík, P., Fietz, J., Morris, P., Pilastro, A. and Ruf, T.(2010) Survival rates in a small hibernator, the edible dormouse: a comparison across Europe. *Ecography*, no. doi: 10.1111/j.1600-0587.2010.06691.x

AN EASY WAY TO REDUCE PIT-TAG LOSS IN RODENTS

Much of what we have learned about dormice (hazel and edible) and other species over the years has been thanks to our ability to mark individual animals. These capture-mark-recapture studies have enabled us to track their movements, learn how far they range, or how long they can live in the wild and more. The current preferred method for marking individuals is PIT-tagging. This involves inserting a microchip into an animal, and the unique barcode can then be read with a hand-held reader, scanned over the animal's body.

PIT – or passive integrated transponder – tags are relatively easy to apply and allow an unambiguous identification of animals in the field. Currently the loss rate of tags varies between different species and in rodents the loss can be as high as 7.2%. What usually happens is that the transponders emigrate out of the body through the puncture wound shortly after the tag has been injected in and before the wound has healed.

Karin Lebl and her team decided to try and test the use of tissue adhesive to seal the puncture wound and compare the loss rates of PIT-tags with and without the adhesive. They had a study site in Austria where they were monitoring edible dormice. Using a cone-shaped cotton sack, with a lengthwise hook and loop fastener, Karin was able to capture, mark and measure the animals without using anaesthetic. Animals that hadn't previously been captured had a PIT-tag injected dorsally towards the head, so the transponder was located on the upper back. In 2006 the team lost 7.4% of the tags, so the second year they started using the tissue glue to seal the wound. At the same time they marked the animals by fur clipping a small wisp of tail hair. This meant Karin could identify animals whose tags had been lost if they caught them again within a couple of months of being tagged. The loss rate of tags in 2007 dropped to just 2.2%, which means that this kind of study can be made even more accurate and more detailed information about the animals can be obtained.

PAUL BARROW

Lebl, K. and Ruf, T. (2010) An easy way to reduce PIT-tag loss in rodents. *Ecol Res* 25; 251-253.

The effects of habitat loss and fragmentatio

Both habitat loss and habitat fragmentation are commonly regarded as being among the greatest threats to global biodiversity. These two distinct processes, however, are often misleadingly and ambiguously both referred to under the term habitat fragmentation. Whilst the effects of both are understood to have negative outcomes on many of our species and ecosystems, it is crucial to identify the impacts separately to ensure the most effective conservation measures are put in place.

Many factors are at play in determining how suitable a landscape is in supporting populations of species. These include the extent of habitat (e.g. forest cover), the composition of the landscape (proportion of different land-type uses), the geography and physical environment and how different types of habitat within the landscape (e.g. woodland cover) are laid out. For example the number of patches of woodland and the clumping or aggregation of those patches will affect the species that are able to live in that landscape. The structural connectivity – or physical continuity of elements in the landscape – is often provided on farmland by hedgerows. This too can play a major part in how suitable an area is for different animals – by itself and in conjunction with other factors such as extent of woodland cover.

This study sought to determine what – or what combination of - factors most affected dormice in the Italian landscape: habitat loss, habitat fragmentation, and changes in structural connectivity. In this case it was the amount of hedgerows.

Unlike previous studies that have focussed primarily on birds, this particular one looked at these effects on two arboreal mammals: hazel dormice and red squirrels. Both species are known to be sensitive to the loss and fragmentation of forest habitat. In particular we sought to establish the value of hedgerows as a conservation measure and so we explored whether the influence of structural connectivity provided by hedges varies depending on the amount of forest habitat in the landscape.

Our study area was located in central Italy, covering an area of 18,000km^2 divided into 41 4 x 4km blocks. Each of these blocks contained deciduous oak woodland, however the land-type varied significantly from extensive cereal cultivations dominating the plain and coastal areas and orchards of olive groves, hazel nuts and vineyards being more dominant in the upland hilly areas. The central, south east and south west areas also contain large urban settlements. Across the landscape there is a system of relatively well-connected hedgerows, quite narrow (often less than 5m wide) composed of thick scrub vegetation such as bramble, hawthorn, dog rose and oak.

We selected large 4 x 4km blocks or landscape squares so that they were likely to contain populations of the two target species. The squares were then divided into different categories according to several different factors. These included the amount of forest cover, how patchy and clustered together each of these forest patches were, the amount of hedgerows in the landscape and how well connected the various patches of forest in the landscape were. For each of the following amounts of forest cover in the landscape (<5%, 5-10%, 10-15%, 15-20%, 20-40%, 40-80%), we chose pairs of landscape squares or blocks with contrasting configuration and contrasting levels of connectedness. Landscapes with extremely low levels of connectedness (no hedgerows) were selected only for low levels of forest cover (<15%) as we were unable to find them for higher levels. Such an experimental design allowed us to separate the independent effect of habitat loss from fragmentation and also from connectivity.

We surveyed for dormice using 745 wooden nest boxes spaced at least 70m apart and checked four times in the spring/summer and three times the following autumn/winter. Ten landscape blocks were surveyed from spring 2006 to spring 2007 and the remaining 31 from spring 2008 to spring 2009.

Using a protocol we'd developed previously we determined the number of nest boxes we would need to ensure detection with a high degree of certainty. This included looking at factors such as survey effort and patch size and enabled us to put out no more than 15 boxes or tubes in each woodland patch at a density of roughly 1/ha. Within each

Small sized habitat patch in *Medicago sativa* agricultural matrix.

ALESSIO MORTELLITI

on on dormice in central Italy

ALESSIO MORTELLITI

Forest patch surrounded by a recently harvested corn field.

There are important differences between rural landscapes in the UK and Italy. Oak woodland patches in Italy may be particularly rich in shrub species and potentially closer to the ecological optimum for dormice. Early studies have shown that females in this type of habitat have a higher reproductive level – often an average of eight in a litter, compared to litters of five to six in other habitat types.

Meanwhile hedges in Italy are very different to those in the UK. There is no tradition of the type of management that is often used in the UK. Italian hedges can be very narrow and may not necessarily include trees. They are often monospecific lines of shrubs that may be cut during ploughing, which are frequently located near small rivers or at the border of land properties.

block surveyed the number of woodland patches sampled increased with the number of patches present. So in a landscape with no fragmented woodland we sampled just one patch, but in largely fragmented areas we sampled up to six different patches to give a good coverage across the landscape square. In total 110 patches of wood were sampled. Where more than one patch of wood was surveyed we always included the two largest patches of woodland. Where three or more patches were sampled the remaining patches were selected so as to give the best coverage across the landscape square.

After our first fieldwork season we were confident that sampling the two largest forest patches was sufficient to reduce the risk of false absences in the data at the landscape level.

The survey results showed that hazel dormice were present in 29 of the 41 landscapes squares surveyed. Analysing these results along with the data about landscape type and make-up confirmed that the probability of finding hazel dormice was related to both the amount of habitat available and how well it was connected. In other words hazel dormouse presence increased with the amount of forest cover and the increased connectivity of the forest patches by hedgerows. Looking at the results in more detail confirmed that habitat amount, rather than habitat fragmentation, is the main driver of distribution patterns for both the hazel dormouse and the red squirrel. And – as predicted – a network of hedgerows also plays an important part in determining the distribution of dormice – though less so for the red squirrel.

As the amount of habitat available for dormice is crucial then preserving existing habitat and restoring poor quality habitat should be a conservation priority. The second most important factor is the amount of hedgerows: but the structural connectivity will only benefit dormice where there is already moderate forest cover available in the landscape. Although restoring habitat is more expensive than implementing a network of hedgerows, when there are low amounts of forest cover left in the landscape (i.e. less than 5-10%) then habitat restoration is the most effective strategy. Improving the amount of connectivity between patches of woodland is an effective measure for conservation in the landscape where at least moderate amounts of habitat remain. Habitat fragmentation in turn plays a more minor role in determining distribution patterns as long as those woodland patches were connected by hedgerows.

These results are also consistent with results of studies on bird species. The total amount of habitat is an important driver in the occurrence of species in the agricultural landscape.

This study did not have time to look at other key issues, which are relevant for future studies. The quality and structure of forest patches will also impact on how useful a habitat is for different species, as do the structure and internal characteristics of hedgerows. For the conservation of species in the landscape further studies should focus on the dynamics of colonization, extinction and general population trends to determine, for example, if landscapes with low amounts of habitat are working as large-scale sinks. Worryingly if this were the case increasing hedgerow connectivity to such areas could be facilitating the flow of individuals into a 'landscape trap'. However these results provide strong empirical evidence that halting habitat loss and carrying out habitat restoration should be conservation priorities, taking into account amount of forest cover when carrying out hedgerow restoration too.

Alessio Mortelliti, alessio.mortelliti@uniroma1.it

Mortelliti A., Amori G., Capizzi D., Cervone C., Fagiani S., Pollini B., Boitani L. 2011. Independent effects of habitat loss, habitat fragmentation and landscape connectivity on the distribution of two arboreal rodents. *Journal of Applied Ecology* 48 (1): 153-162. doi: 10.1111/j.1365-2664.2010.01918.x

The behaviour of dormice in hedgerows with g

Linear habitats, such as hedgerows, are thought to help animals move across areas of land that may otherwise be inhospitable. Hedgerows may help increase the rates of dispersal between patches of habitat and therefore help dormice colonise new areas of woodland or scrubby habitat. If this is the case then hedges are vital for the survival of species in fragmented habitats. Paul Bright, from Royal Holloway, University of London (RHUL), decided to see what factors increase use of hedges by dormice. Do dormice use hedgerows as protection from predators? Do the hedges provide navigational clues? Continuity or gaps will influence the quality of the hedge as a corridor. Paul also decided to investigate whether longer corridors might need to provide food and resting sites in order to be attractive to dormice, in particular if they were able to act as 'stepping stones' for longer passages of dispersal.

Previous research by Paul and Pat Morris at RHUL confirmed that hazel dormice are highly arboreal and are often found in small woodlands which are well connected by hedgerows, but are rare in areas where hedgerows are scarce. In order to restore dormice to their former range it is very important that we understand the relationships between their dispersal and hedgerows so that we can ensure the right conservation strategies are put in place.

Paul set up an experiment on the Isle of Wight to look at how dormice move in a natural setting and to see how their patterns of movement are affected by the structure of the corridor. He also wanted to see how dormice move in non-corridor habitats such as grassy fields, as they form a major part of our landscape. Twelve dormice were caught (11 male, one female) and fitted with miniature radio collars. Each of the dormice was kept over the summer of 1995 and released at three different trial sites in turn. These sites were between 1.4 and 2.6km from where they were caught.

The first site was a cut hedgerow on average 1.5m high, 1.9m wide and 256m long, running from a small patch of woodland and ending in an open field. Any shrub flowers on the hedge that may have provided food for the dormice were artificially removed as they matured. The second site was an uncut hedge on average 4.4m high, 2.45m wide and 303m long connecting two small woodlands. The uncut hedge included extensive patches of bramble with flowers. Although the hedges were different in size and presence of food, they were similar in terms of their species diversity and composition. Both hedgerows contained several gaps, which were grouped into three types according to how wide they were: 1m, 3m or 6+m. The width of gaps and how they were dispersed throughout the hedgerows were similar in both hedges. The third site was a grassy field, which contained no animals and which was kept cut to 20-30cm high throughout the experiment.

Two hours before sunset the dormice were taken to the trial sites in nest boxes, which were either fixed to branches within

Thick, continuous hedgerows can provide food and shelter for species such as dormice as they disperse across the countryside.

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gaps

the hedgerows or put on the ground in the field and covered with a dense layer of branches to provide cover for the emerging animals. Every animal was then radio-tracked until dawn. Each dormouse was released at each of the three sites in turn. Trials were suspended on nights when the vegetation was wet or there was a full moon in case either influenced the behaviour of the dormice. The team were able to track the dormice silently, using headphones, and getting within 5m of the dormice were able to pinpoint their location to within 1m, every two minutes.

The dormice were clearly averse to moving on the ground and didn't readily cross hedgerow gaps. In both the cut and uncut hedgerows dormice approached the gaps (i.e. came to within 1m of the gap) 43 times. There was a highly significant difference in the frequency with which gaps of different widths were crossed. Gaps of 1m were crossed 55% of the time, gaps of 3m were crossed only 6% of the time and gaps of 6+m weren't crossed at all.

Dormice also travelled further, faster and turned more frequently within the cut rather than the uncut hedge. The availability of food within a hedge is obviously important for dormice and the increased movement in the cut hedge was likely to be the result of the dormice looking for food. For animals with low fasting endurance a lack of food in a corridor will make it less useful.

The dormice that were released in the field spent significantly less total time stationary than when released in hedgerows. Whilst dormice at all release sites travelled a similar amount of total distance those released in the field moved further on each move and lost significantly more body mass than the animals in the hedges. The behaviour of the dormice placed in a grass field may not have been completely natural as they were placed in a habitat that they might not enter even when dispersing. However the animals did leave their nest boxes and the protective covering provided by the branches of their own volition. Subsequent behaviour thus at least demonstrates their potential to move in non corridor habitat and they were clearly capable of rapid movement across the ground despite the fact that they are well adapted for a life in the trees, with their grasping feet and tendon-locking mechanisms that help them climb under branches. The fact that whilst the dormice were on the ground they tended to have longer lengths of movement and only brief periods spent still suggests they were exhibiting 'escape behaviour'. However the results also

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demonstrate that non corridor habitat does not present a complete barrier even to a highly arboreal species.

This study provides some of the first experimental evidence that gaps may constrain the movement of dormice in habitat corridors. A tolerable gap width will probably depend on the spatial scale at which the species perceives the landscape and the structural contrast between the corridor and gap vegetation. Many hedgerows in Britain are currently unmanaged and discontinuous, and the results of this study suggest that reinstating management – especially filling in the gaps, may increase rates of successful dispersal by dormice.

The above article is a summary of the following paper. Bright, P. W. 1998. Behaviour of specialist species in habitat corridors: arboreal dormice avoid corridor gaps. *Animal Behaviour*. 56:1485-1490.

The paper has been interpreted by Nida Al Fulaij.

Even small gaps in hedgerows can create a barrier for an arboreal species such as the hazel dormouse.

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Training courses and news

INTERNATIONAL DORMOUSE CONFERENCE SAXONY SEPTEMBER 2011 The 8th International Dormouse Conference, hosted by the Senckenberg Museum of Natural History Goerlitz, will be held in Ostritz, Germany from 22 -27 September 2011.

Topics of the conference are the results of dormouse research, such as physiology, morphology, ecology, behaviour, palaeontology or conservation.

The conference will take place in Ostritz, 15km south of Görlitz close to the Polish and Czech borders. It will be in the International Meeting Centre (www.ibz-marienthal.de), part of the baroque Cistercian Abbey St. Marienthal, where accommodation is available for 130 delegates.

More details can be found at www.senckenberg.de/IDC8 or email dormouse@senckenberg.de

TRAINING COURSES 2011 Cheshire Wildlife Trust (CWT) will be running *Dormouse Ecology and Conservation* on Saturday 1 October, at Bickley Hall Farm, Cheshire. The day covers a general introduction to dormouse ecology, as well as an introduction to the work of the North West Dormouse Partnership. There is a site visit in the afternoon. The cost is £35 (or £25 for CWT members). To book phone 01948 820728 or email info@cheshirewt.org.uk.

PTES will be running two *How to Manage Woods for Dormice* courses taught by Dr. Pat Morris. On Monday 10 October the course will be held in Surrey and on Tuesday 25 October in East Sussex. For further details and a booking form please contact Susan on 020 7498 4533 or email susan@ptes.org.

The Mammal Society *Dormouse Ecology and Conservation* courses are:
10 Jun – Cheddar, Somerset
8 July – Cheddar, Somerset
19 August – Wildwood, Kent
10 Sept – Wildwood, Kent
16 Sept – Cheddar, Somerset
14 Oct – Cheddar, Somerset
Suitable for all levels this one-day course is ideal for those with a general interest as well as those working towards their Dormouse Handling Licence. The course includes a visit to check nest boxes and, under some circumstances, the opportunity to handle dormice under supervision. Call 02380 237 874 or email Alex for more info adunlop@mammal.org.uk.

Wildwood Trust in Kent runs a *Dormouse Handling and Survey Techniques Workshop* where small numbers of people can get handling experience using captive dormice. This year's courses are full but for further details or to be put on a waiting list contact Hazel Ryan on 01227 711900 or email hazel@wildwoodtrust.org.

DO YOU KNOW ANY POTENTIAL DORMOUSE RELEASE SITES? As you well know, the hazel dormouse has disappeared from several counties where it was found in the late 19th century. It now occurs almost entirely south of a line between Suffolk and Shropshire, save for remnant populations and reintroduced populations of captive-bred animals.

The hazel dormouse reintroduction programme has been going for almost twenty years now with reintroductions at 17 different sites throughout England. The aim is to release dormice back into counties where they have become locally extinct, or have scattered or isolated populations.

We are always looking for suitable woodlands. Such sites would contain a diversity of deciduous trees and shrubs, preferably with little shading of the understorey, creating a full 'three dimensional' structure with plenty of arboreal links among and between the canopy and shrub layer. Of key importance is plenty of fruiting hazel, at least seven years old. Other species which dormice depend on for food and bedding at various times throughout the year are honeysuckle, bramble, dog rose, oak and ash. It would be preferable to have good linkages to other areas of woodland and thus a reasonable prospect of any new population of dormice spreading.

We are looking for woods either in the following counties which have no or few known natural populations remaining, are adjacent to counties within the core range and are within the known historical range of the dormouse:

- Cambridgeshire
- Cheshire
- Derbyshire

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- Lincolnshire
- Lancashire
- Leicestershire
- Nottinghamshire
- Yorkshire

or counties with isolated populations, which require strengthening:

- Bedfordshire
- Northamptonshire
- Staffordshire
- Suffolk
- Warwickshire.

Woodlands should be in excess of 20ha (50 acres) or they could be a smaller area linked to more woodland habitat by species rich hedgerows. If the site has a southerly aspect and is not too public, so much the better. Ideally the wood will be managed on a long rotation coppice, in small coupes and at irregular intervals. It is important that sheep and other livestock should be excluded from the reintroduction area, as they are likely to trample dormice in hibernation.

If you know of a wood or would like more info email nida.al-fulaij@ptes.org or call Nida on 020 7498 4533. Thank you.