# DORMOUSE ECOLOGY AND MITIGATION

## Proof of Evidence of

## Michael Woods

## On behalf of the White Horse Alliance

## Public Inquiry into
## The A350 Westbury Bypass 2008

1. I am Michael Woods, a full member of the Institute of Ecology and Environmental Management and a Chartered Environmentalist. I have been studying dormice since the early 1980s and have undertaken numerous dormouse surveys and prepared practical proposals for their future conservation for major residential and. industrial developers, highway authorities and mineral extraction companies. I have wide experience of the dormouse survey techniques, habitat management and mitigation requirements required for Natural England and National Assembly for Wales licences. I am joint author of the South West Dormouse Project, English Nature Research Report No 524, which has established dormouse nesting tubes as a recognised survey technique. I am a member of the national Dormouse Species Action Plan Focus Group and was on the editorial panel comprising UK dormouse experts for the second edition of the Dormouse Conservation Handbook, published in 2006 by Natural England. I am a consultee for the next edition of the Design Manual for Roads and Bridges in relation to dormice, I am a specialist adviser on the management of motorway and trunk road verges for dormice and am joint author of a paper on Dormice on Road Verges in the journal of The Institute of Ecology and Environmental Management. I am an advisor on dormice to the Countryside Council for Wales and police wildlife officers. I keep captive dormice and am a primary provider of these animals for Natural England's captive breeding

and release scheme and I run The Mammal Society's 'Dormice and Development' courses for consultants and other professionals.

2. The common or hazel dormouse, *Muscardinus avellanarius*, is a small, specialist, nocturnal rodent which lives at low densities, reproduces slowly, enjoys a specific diet and an arboreal lifestyle, and hibernates for up to seven months of the year. Consequently it can be hard to detect, because it is rarely seen and leaves few field signs, and survey techniques have to be carefully applied in order to establish its presence. In the event of development, its legal protection and continuing decline in numbers mean that significant mitigation must be put in place in order to ensure 'that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'. (The Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007 (the Habitats Regulations). Paragraph 44 (3) (b)).

3. According to RPS Planning Transport and Environment (RPS), anecdotal evidence of the possible presence of dormice on the route of this road was originally raised by the county ecologist. (RPS 2007a paragraph 9.187). This led RPS to carry out a dormouse survey in 2004 using 36 nesting 'tubes of the type recommended by The Mammal Society' and 15 standard dormouse boxes, between June and October, when they were checked three times. The tubes and boxes were also sited on the basis of the presence of coppiced hazel. It is difficult to know the foundation for this idea but there is a clue in

the methodology for the nut search carried out in 2005 which states that 'hazelnuts provide a vital food source for dormice as they fatten up for their winter hibernation' (RPS 2007b p.3,). In 1999 Sue and Roy Eden (Eden R. & Eden S. 1999, p 187) wrote 'Dormouse presence, from nest evidence, has been found in a low-cut hedge over 1 km from any area with fruiting hazel.' Clearly hazelnuts are not 'a vital food source'.

4. RPS carried out two hazelnut shell searches, one on 21 June before hazel fruits and the second on 28 November, after leaf fall (RPS 2007a,b). The Dormouse Conservation Handbook (Bright P, Morris P and Mitchell-Jones T. 2006) (p 23) suggests that nut searches should be carried out between mid-August and Christmas but those working on a scheme of this significance should have sufficient experience of this methodology to know that, for optimum results, nut searches should take place in September or early October. Mid summer searches simply find a few of last year's degraded nut shells while late November searches will be carried out after the bulk of the autumn leaf fall, meaning that many of the autumn nuts will be remain undiscovered.

5. Although English Nature Research Report 524, 'Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project.' (Chanin P. and Woods M. 2003) was published in 2003, there is no reference to the use of its methodology in connection with the 2004 survey but there is a later reference, in the 2007 summary report (RPS 2007a), to the survey

value of 16.3 as being adequate, 'given the circumstances and time constraints', to conclude that dormice were not present in the survey area. The Dormouse Conservation Handbook, published by English Nature in 2006 (Bright P, Morris P and Mitchell-Jones T. 2006), before the summary report was written, states that 'assumed absence should not be based on a score of less than 20' (p27). The 'scores' of 16.3 and 20 refer to indices given to each month when dormice are active and reflects the likelihood of their use of dormouse nesting tubes during that month (e.g. July = 2, August = 5, September = 7 etc.). These are added together for the months when the tubes are in place and multiplied by units of 50 tubes used in the survey (50 tubes = 1, 100 tubes = 2 etc.) A score of 20 is necessary to prove an adequate survey.

6. Research Report 524 (Chanin and Woods 2003) clearly points out that nest tubes are not the perfect survey tool. 'It is evident that some dormice are being missed as they were present at some sites where they were not recorded (using nest tubes). In addition, the rate of accumulation of new sites had not levelled off by the end of the Project'. It goes on: 'not all sites with dormice will be identified as such in a single season' (p 16).

7. In spite of this, RPS still persisted in claiming that there were no dormice here and denigrating a perfectly legitimate record. 'A dormouse nest was reportedly found in an independent survey carried out over part of the site in

2004. However there is significant doubt as to the validity of this record.' (RPS 2007b, p.S1, point S4).

8. Penny Lewns, of The Badger Consultancy, was the person who found the dormouse nest so consistently doubted by RPS. Her report (RPS 2007b, Appendix 2, 2.1) indicates that her survey used 'tubes supplied by The Mammal Society' i.e. those used universally in the UK for dormouse nest tube surveys. It also points out that the tubes were not erected until August, half way through the dormouse active season, and that she made three checks. She cites Chanin and Woods (2003) in her report, setting out some of the problems with this survey method made in paragraph 3 above (RPS 2007b, Appendix 2, 4.5). Penny Lewns has over 30 years experience as a field mammalogist and is a professional consultant, bound by a strict code of professional conduct by her membership of the Institute of Ecology and Environmental Management. She is certainly not going to 'find' a dormouse nest about which there is any doubt.

9. In spite of Penny Lewns' evidence, RPS still reached the conclusion (RPS 2007b, Appendix 3, 3.8) that there was 'no evidence of dormice using the site'. Paragraph 3.9 is more ambiguous, however, for it carefully, and somewhat disingenuously, states that 'it is reasonable to conclude that dormice are not present in the survey area'. RPS' survey area did not cover the hedgerow to the south of Bere's Mere Farm, which will be cut by the new road, where Penny Lewns found a dormouse nest.

10. It is not surprising that RPS did not find signs of dormice in the nest tubes and boxes erected in their second survey on 11 July 2005. Only three checks were made and these were carried out on 21 October 2005, 28 April 2006 and 3 September 2006. Again ecologists working on a scheme of this nature should have sufficient experience of inspecting dormouse tubes to know that dormouse nests, frequently built in the peak period of September, are often destroyed by woodmice during the following weeks and may not be recognizable by 21 October. Dormice are only just coming out of hibernation on 28 April and so are most unlikely to be found in nest tubes. Certainly they would not have built nests by then. 3 September is immediately before the peak use of tubes and so not a prime date for an inspection.

11. Interestingly, RPS report (RPS 2007a, paragraph 9.195) that the nest tube surveys in 2004 and 2005 'followed guidelines set out in the Dormouse Conservation Handbook' published by English Nature, but not until 2006.

12. It is surprising that Wiltshire County Council appears to suspect the evidence found by Penny Lewns, especially as Wiltshire and Swindon Biological Records Centre is happy to accept it. The County Council, on another site elsewhere in the county and in the same year, imposed rigorous and inflexible ecological planning conditions on the evidence of a single dormouse gnawed hazel nut shell. Why weren't they are so stringent with themselves at Westbury?

13. Nevertheless Wiltshire County Council was sufficiently concerned to commission another survey, this time from Nicholas Pearson Associates (NPA), and carried out by an accredited agent on another's English Nature dormouse licence. This report (Nicholas Pearson Associates 2006, p 1) points out that the dormouse has declined in range and numbers across the UK as a result of 'habitat loss and fragmentation' but attributes this to 'changes in woodland management' and 'an increase in intensively managed hedgerows'. These are both historic reasons for the decline of this small mammal. Today much more important and modern causes of the continuing decline of the dormouse are development and road construction but these have been omitted. 'Roads and other developments can cause significant incidental damage to populations of dormice by fragmenting habitats.' (Bright P, Morris P and Mitchell-Jones T. 2006, p 51)

14. The NPA survey did not find evidence of dormice after a survey lasting from May to November. It dismissed Penny Lewns' record as historic, the last trace of a now extinct population, and concluded dormice were absent. However dormouse nest tube surveys are not infallible. As Research Report 524 says 'It is essential to bear in mind that when dormice are not recorded in tubes it does not necessarily mean that they are not present' (Chanin P and Woods M. 2003, p 17). On 15 January 2007 I visited the hedgerow to the south of Bere's Mere Farm on the route of the proposed Westbury bypass

where I found a dormouse nest in a dormouse nest tube no.90 erected by NPA.

15. Dr John Knight, of NPA, was aware of my visit and apparently inspected the tube himself on the following day. In my view this nest is incontrovertible evidence that dormice are present at this site and on the route of the proposed road. It is not unusual for dormice to build nests in November or later, after the last check by NPA. Dormice were particularly active in November 2006 and I received numerous reports from colleagues of finding dormice in tubes during this month. Indeed I found active dormice in boxes on my project site in Somerset on 11 and 25 November. Research Report 524 indicates that two new sites were added to the list of positives in November 2002 as a result of nests built in that month (Chanin P and Woods M. 2003, p 10).

16. Contrary to the Summary (RPS 2007b pS1, paragraph S2), neither nest tube surveys nor nut searches are designed to reveal the size of a dormouse population on a site. If the numbers of nests in tubes or gnawed nuts are low, it may simply indicate that the animals are using natural nest sites or eating other food stuffs. Dormice live at very low densities and it is generally acknowledged that a total area of woodland, hedgerow and scrub habitat amounting to about 20ha is necessary to sustain a permanently secure population (Bright P, Morris P and Mitchell-Jones T. 2006, p 19). The total area of Wellhead Springs Wood and White Scar Hanging and the surrounding

hedgerows and scrub amounts to about 18ha, barely sufficient to sustain a permanent population especially as not all of it is in prime condition for dormice, but promising for the future with potential for permanence if improvements to the habitat can be made. If this area, in its current state, is fragmented or destroyed in any way, it will leave small populations of dormice open to chance events, such as accidents, inbreeding or a run of poor summers leading to reduced breeding success. 'Three bad years in a row may be enough to cause local extinction.' (Bright P, Morris P and Mitchell-Jones T. 2006, p 19).

17. It is apparent from the development drawings that attempts have been made to minimise the loss of dormouse habitat as a result of the proposed road scheme. What is much more crucial is the loss of connectivity. Dormice are arboreal mammals and one of their strategies to avoid predation is to spend their active months above the ground in trees and bushes. They appear very reluctant to descend to the ground, and especially to cross open spaces, and so they require continuous hedgerows and woodland to provide not only nesting and feeding habitat but also essential arboreal route ways to enable them to move around.

18. In the light of the two dormouse nests found in the hedge to the south of Bere's Mere Farm, the County Council has reluctantly agreed, 'as a precautionary measure', to mitigate for this loss by indicating that 'an aerial ropeway made of a suitable material and of an appropriate diameter would

be coiled up and over the bat gantries proposed at Bere's Mere Farm and at the Wellhead Underpass, to enable dormice to cross over the road safely at those two locations.' RPS 2007a, paragraph 9.298 p 223). The Dormouse Conservation Handbook (Bright P, Morris P and Mitchell-Jones T. 2006, p 51) notes the following: 'Although ropes have been suggested as a mitigation measure (Highways Agency 2001 Chapter 11), there appears to be no published scientific evidence that dormice actually use them.' Even the Design Manual for Roads and Bridges (Highways Agency 2001 Chapter 10) qualifies the use of ropeways by saying they 'may be proposed in an attempt to mitigate against the isolation effect. At present little research has been undertaken into the effectiveness of such measures for dormice'. Given this information, what is the point of this proposed mitigation and how does anyone know what is 'suitable material' and 'an appropriate diameter'?

19. Rope of the same type is to be mounted on the walls of the underpasses to enable dormice to cross under the road. Use of these is equally unlikely as radio tracking evidence shows that dormice 'are normally only active within cover.' (Bright P, Morris P and Mitchell-Jones T. 2006, p 51). There is no evidence that dormice will use underpasses. These are all experiments and have no place where proven mitigation is required to ensure the favourable conservation status of a European protected species.

20. The loss of connectivity is important for two reasons. The first is that the only linking mitigation proposed, which is known to be effective for common

dormice from German evidence (Bright P, Morris P and Mitchell-Jones T. 2006 p 52), is the 'green bridge' and one is to be located at Chalford accommodation bridge, almost 800m to the west of where the dormouse nests were found in the hedgerow to the south of Bere's Mere Farm. Of the three road crossing locations available (Chalford, Wellhead and Bere's Mere Farm), this is the least useful for dormice and the furthest from their recorded presence. Dormice have a patchy distribution, even within the same woodland (Bright P, Morris P and Mitchell-Jones T. 2006, p 13) and are a sedentary species, travelling on average no more than 70m from their nest (Bright P, Morris P and Mitchell-Jones T. 2006, p 13).

21. The most appropriate location for a green bridge, from the point of view of mitigating the habitat fragmentation for dormice, is at Bere's Mere Farm crossing with Wellhead as second best. Linking the dormice to the Chalford bridge and then back to Wellhead and the Bere's Mere Farm bridges with a lifeline as thin as a new hedge is far too tenuous. In order to fulfil the requirements of the Habitats Regulations, it is necessary to prove that the favourable conservation status of the dormice in this area will not be put in jeopardy by this new road. The connectivity proposed here is leaving too much to chance once the dormouse population has been fragmented by the new road. A green bridge should be built at Bere's Mere Farm crossing.

22. This is reinforced by the Design Manual for Roads and Bridges (Highways Agency 2001, Chapter 10, 10.3) 'Dormice are poor re-colonisers and,

therefore, isolation will increase their vulnerability, and decrease the genetic diversity of the population. Isolation can result from small habitat losses, such as the removal of the hedgerow containing suitable habitat'.

23. The second reason why the loss of connectivity is important is that the new planting, as mitigation for the losses suffered by the dormice, unless made up from translocated hedgerow species or particularly large replacement stock, will take a number of years to reach a size and maturity to be suitable for the animals to use for feeding and commuting. This, coupled with the construction time for the road, estimated to be about 18 months, could mean that the dormouse population is fragmented by the road, in the absence of other mitigation, for seven or eight years, well in excess of the 'three bad years in a row' cited in paragraph 11. The claim that 'the connectivity of the hedgerow network as wildlife corridors would be maintained and enhanced' (RPS 2007a, paragraph 9.336) is clearly impossible to achieve during the construction period and for some time afterwards.

24. The dormouse is a sedentary animal and experience elsewhere has shown that it will venture along narrow hedgerows for only a certain distance. The hedgerow has to provide both food and nesting resources and be of a certain size before dormice will take up residence. The hedgerows along the sides of the new road would have to be replaced with bulk planting,

with tree and shrub species beneficial to dormice, throughout the area linked to the existing dormouse habitat if it is likely to have any chance of success.

25. Clearly there will be an absolute need for those areas of trees and shrubs, planted as mitigation for dormice, to be managed in accordance with a plan written specifically for dormice and which is properly funded. At the time of writing this proof in May 2008, there is no indication from Wiltshire County Council, that this will be the case.

26. If the local authority refuses to countenance building a green bridge at either Wellhead or Bere's Mere Farm crossings, then the new underpasses must be extended beyond the edges of the road in order to plant a sufficient width of new trees and shrubs over the tops of the underpasses to create significant unbroken arboreal connectivity along both sides of the road from the hedge on Chalford bridge to the east side of the Bere's Mere Farm crossing. Note that this is a last resort and not a reasonable alternative to building a green bridge at Wellhead or Bere's Mere Farm.

27. PPS9 (HMSO 2006, Section 5.32) 'states that plan policies should promote opportunities for the incorporation of beneficial biodiversity….. features within the design of development. The design, layout and landscaping of new developments offer enormous opportunities to add to, or enhance, biodiversity….conservation.' The Highways Act 1980, Section 253, encourages this by allowing work to be carried out on third-party land for the

purpose of mitigation. (HMSO 1980). In relation to dormice, the Design Manual for Roads and Bridges (Highways Agency 2001, Chapter 11) points out that 'It is particularly relevant where dormice populations are small and isolated. The aims should be to replace at least the equivalent area of habitat lost, and to provide links between suitable sites. Sympathetic landowners may give permission for mitigation work to be carried out before the start of the main contract.' Advantage should be taken of this in order to establish new dormouse habitat in advance of works taking place on the road so that it is already maturing when work starts. This is particularly important alongside the track linking Wellhead and Bere's Mere Farm and could be used to advantage, for instance, by gapping-up the hedgerow to the south of Bere's Mere Farm.

28. It is noted that the County Council has concluded that the impact on dormice from the construction and presence of the road will be 'Slight adverse'. (Worksheet for Environment: Biodiversity (Source: TAG Unit 3.3.10) P 20) I strongly disagree with this conclusion because the proposal, as currently planned, is likely to adversely affect the conservation status of dormice across the area of its habitat here, which apparently enables it to sustain the population levels of the species at a favourable level (table 9.2). Without a green bridge directly linking the two woodlands, the population will be split in two and made vulnerable to chance events such as ' three bad years in a row'. Consequently I believe the magnitude of the effect will be 'Major negative'. The nature conservation value (table 9.3) of the dormouse

is High given that it is a Priority Species in the UK Biodiversity Action Plan (HMSO 1994) and a Key Species in the Wiltshire Biodiversity Action Plan (Wiltshire County Council 2002) under the Hedges and Woodland Local Action Plans. It is also protected under the Wildlife and Countryside Act 1981 (as amended) and included in Schedule 2 of the Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007 (the Habitats Regulations) which implements EC Directive 92/43/EEC in the UK. It is listed in Appendix III of the Bern Convention (1979). It is a species which is still in decline, in spite of its protection, and may number as few as 40,000 individuals in the UK (unpublished data included in a paper given by Dr Paul Bright at The Mammal Society's autumn symposium 2004 'British Mammal Populations – 50 Years of Change'). The magnitude of the potential impact as 'Major negative' on a species with a 'High' nature conservation value is 'Very large adverse'. In my view this more truly reflects the potential impact on dormice in Wellhead Springs Wood and White Scar Hanging as a result of the siting, construction and use of the proposed road.

29. Without the inclusion of a green bridge directly linking the two woodlands in areas where dormice have been recorded, it is impossible to see how the favourable conservation status of this population of dormice, fragmented by the road, can be maintained in this area and thus it cannot satisfy the third question posed by Paragraph 44 (3) (b) of The Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007 (the Habitats Regulations).

## References


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**Summary**

A number of dormouse surveys of questionable accuracy were carried out by RPS on parts of the route of the proposed Westbury bypass during 2004, 2005 and 2006. A more competent survey it was then undertaken by Nicholas Pearson Associates (NPA) during 2006. In spite of the warning given in English Nature Research Report 524 that lack of evidence does not mean the absence of dormice, NPA concluded that dormice were not present and the record, previously found by Penny Lewns, was dismissed as the last throes of a now extinct population. On 15 January 2007 I visited the hedgerow to the south of Bere's Mere Farm on the route of the proposed Westbury bypass where I found a dormouse nest in a dormouse nest tube. In my view this was incontrovertible evidence that dormice are present on the route of the road and their habitat in Wellhead Springs Wood and White Scar Hanging will be fragmented by its construction.

The mitigation proposed by the local authority is inadequate. There is no evidence that dormice will use rope bridges and underpasses and the proposed green bridge, a valiant attempt at mitigation, is about 800m away from the site where this population of dormice was found to be living. Dormice are sedentary and live at low populations. They also make patchy use of their habitat and it is entirely possible that, without management work

to this habitat in favour of dormice, they might never reach the bridge. Furthermore some of the roadside planting to provide dormice with connectivity amounts to just a narrow hedgerow, a riskily slight provision when every effort should be made to reconnect the population.

Finally I disagree fundamentally with the County Council's conclusion that the impact on dormice as a result of the construction and use of this road will be 'Slight adverse'. Without a green bridge in the most appropriate location to promote the re-linking of the dormouse population here, the splitting of this population will render it liable to extinction from chance events and so the magnitude of the effect will be 'Major negative'. The nature conservation value of the dormouse is 'High', particularly as it is still in decline, in spite of legal protection and positive efforts to improve its status. A 'Major negative' impact on species of 'High' conservation value is 'Very large adverse' and more truly reflects the impact of the proposed road on this population of dormice.