

Title: Conservation genetics of the common dormouse: Dispersal characteristics of natural and reintroduced populations of the common dormouse *Muscardinus avellanarius*, PhD Thesis, University of Liverpool, 2010

Author: D.Md. Naim

Country: UK

Background to study

Due to the arboreal habits of dormice their dispersal ability is likely to be affected by habitat loss and fragmentation which may increase the probability of small populations going extinct through inbreeding effects or through a loss of evolutionary potential. As such reintroduction programmes have been used to re-establish captive bred dormice within their historical range. Understanding the dispersal characteristics natural and reintroduced dormice will provide valuable information that can help underpin the in situ management of populations.

Method

- A reintroduced and natural population of dormice were studied using 230 and 250 nestboxes in ancient woodland (Wych) and mixed broadleaf and conifer wood (Bontuchel) respectively.
- Nest boxes were at 20-40 m intervals and were checked twice in spring and autumn in Wych and monthly in Bontuchel. Dormice were microchipped, weighed and their sex, age and breeding status was recorded. Hair and buccal swab samples were collected from individuals in 2006-8.
- Capture data from 508 and 212 individuals from Bontuchel and Wych respectively was used to determine the movement patterns between sexes and populations.
- DNA was extracted from 296 and 135 hair samples obtained from Bontuchel and Wych. Ten microsatellite regions of the dormouse gene were amplified for each sample. The effective population size, dispersal characteristics, temporal genetic variation and whether either population had undergone a recent bottleneck were investigated.

Key results

- On average male dormice moved significantly further per month (64.17 m) than females (53.62 m) at both sites. There was genetic evidence for male-biased dispersal in adults at both sites and average relatedness was lower in males than females but only significant in adults.
- Genetic analysis revealed neither site had lower than expected genetic diversity but the natural population had greater, but not significant, genetic variability than the reintroduced population. There was no evidence that either population had undergone a recent genetic bottleneck.
- The number of individuals contributing to the breeding cohort (effective population size) varied over years and ranged from 138.2 - 230.8 ind. at Bontuchel and 109.9-149.1 ind. in Wych. These estimates were greater than the number of animals found during nest box surveys at both sites but immigration into the site was relatively low (11 and 9 individuals at Bontuchel and Wych)
- Genetic differentiation among individuals increased with increasing distance (500-1 km), however dispersal was sufficient to counteract sub structuring of populations within each site.
- There was no evidence suggesting dispersal behaviour of captive bred dormice differed from natural populations.

Key messages to landowners and managers derived from these results

- Nest boxes are useful for determining relative abundances of dormice; however they fail to sample all individuals and as such this should be a consideration when determining the presence of dormice in woodlands where development or management work is planned.
- Reintroductions appear to be successful in generating viable populations from relatively small founding stock; however increasing the number of founders should increase genetic diversity.

- Maintaining woodland structure is essential to maintain dispersal routes for dormice.

Key words/phrases

Dormice; *Muscardinus avellanarius*; microsatellites; genetic diversity; multiple mating; paternity