

Title: The Population Ecology and Monitoring of the Dormouse *Muscardinus avellanarius*: Effects of summer temperature on productivity: possible mechanisms by which climate may affect dormouse abundance, *PhD Thesis, Royal Holloway, University of London, 2004*

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Background to study

Due to the specialist habits of dormice, they are thought to be particularly vulnerable to changes in weather conditions as this is likely to affect food resource availability and influence their activity patterns. Data from the National Dormouse Monitoring Programme provides an opportunity to investigate the effect of weather on the breeding success, survival and abundance of dormice to enable future predictions to be made about their response to climate change.

Method

- Data on dormice (number and weights of juveniles, May-Oct and number of females in May/June) were obtained for years 1993-2002 from 32 National Dormouse Monitoring Programme (NDMP) sites across the UK. Only sites monitored for 5 years or more and where box checks were conducted at ≤ 40 day intervals through June-September were included.
- Sites were separated into land class groups and included Arable I & II, Pastoral IV and Marginal Upland VI and were defined as oak or hazel dominated woods based on NVC surveys.
- Birth date, biomass of viable young in autumn per adult female and number of potentially viable juveniles (≥ 6 g) in autumn per adult female were used as measures of dormouse productivity.
- Weather data was obtained from local weather stations and used to investigate the influence of weather on dormouse productivity, % individuals in June torpor, birth dates and dormouse biomass and whether these vary depending on the type of habitat in which the site is located.

Key results

- There was little variation in the birth dates of juveniles, between land class groups but the mean biomass, juveniles per female and the mean litter size were lower in marginal upland VI which dominates the north and north-western NDMP sites.
- Ambient temperature did not explain the variation in birth dates observed across the UK.
- Higher June-July temperatures increased the productivity of female dormice, however females were less productive in pastoral and upland areas than in arable class groups which predominate the south of the UK.
- Higher ambient temperatures in June-July appear to increase the probability of dormice breeding more at oak sites than at hazel sites and is likely to be due to food resource differences between the woodland types.
- Low ambient temperatures in June were related to a higher proportion of torpid dormice but there was no evidence that this impacted the productivity of dormice by delaying birth date. It may however prevent breeding at all however this was not measured in this study.
- Biomass and juveniles per female have decreased between 1993 and 2002 at oak sites only but this is unlikely to be related to summer temperature as this has not declined over this period.

Key messages to landowners and managers derived from these results

- Woodland connectivity should be promoted between woodland patches of variable composition to facilitate dispersal of dormice when resources are unavailable within particular woodland sites. This will allow dormice to exploit other woodlands when required and provide immigrants into populations that have suffered reduced productivity due to unfavourable weather conditions.

- Conservation effort should be enhanced in the north of the UK to ensure dormouse populations remain viable in the longer term.

Key words/phrases

Dormice; *Muscardinus avellanarius*; National Dormouse Monitoring Programme; climate; abundance; torpor; birth date; hazel; oak