Title: Habitat suitability model for the common dormouse *(Muscardinus avellanarius)* based on high resolution climatic, landscape and forest inventory data, *Peckiana, 2012*

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Background to study
Empirical evidence suggests that the distribution of dormice is influenced by climate, landscape connectivity, forest type, species composition and structure. As such determining the factors influencing dormouse distribution at a local and regional scale may be complex. Habitat suitability models have potential to provide a valuable tool for determining the species-habitat relationship that can be used to guide conservation efforts to maintain/improve regional dormouse distribution.

Method
- Spatial data points for dormouse presence (257) and absence (257) were obtained for the German state of Hesse from the government data base and volunteer surveys.
- Data on the structural and species composition, age and % cover of conifer trees were obtained from forest inventories for the central Hesse regions, constituting 100 forest stands.
- Ecologically relevant environmental spatial data (land use, landscape composition incl; 8 landuse types, landuse diversity and landscape fragmentation, climate and topography) and five climatic variables (summer max temp and mean precipitation, winter mean temp and precipitation and seasonal temperature) were obtained as high resolution digital databases.
- Environmental and climatic variables were assessed within a GIS environment for their value in predicting the presence and absence of dormice to develop a Habitat Suitability Model (HSM).

Key results
- Land use type was the strongest predictor of dormouse presence with dormice occurring in deciduous (n-67), conifer (n=32) and mixed (n=113) forest types and in hedgerows (n=45).
- Dormouse absence records were located evenly across all land use types.
- Maximum summer temperature positively influenced the occupation of sites by dormice.
- Forest stands >50 yrs (optimum 80 yrs), with >5 tree species and < 9% conifer cover were the most suitable sites for dormice in combination with higher summer temperatures.
- Locally, dormice are more likely to be present where summer temperatures are $\geq$ 22.5 °C.

Key messages to landowners and managers derived from these results
- Maintaining mature, species rich woodlands will help conserve extant dormice across Hesse.
- Conifer and mixed woodlands are capable of supporting dormouse populations and maintaining/reducing the cover of conifer trees so that they do not exceed 10% of total forest area will promote more suitable habitats for dormice.
- Hedgerows are important landscape components for dormice and their retention and sympathetic management will help dormice dispersal and viability.
- Dormice are more likely to occur in areas which have a higher summer temperature and as such conservation efforts should focus here. Where areas are colder, habitat enhancement works may help to improve habitat suitability to compensate for less suitable climatic conditions.

Key words/phrases
Dormice; *Muscardinus avellanarius;* habitat suitability model; climate; environmental variable; hedgerows; forest structure; forest age; distribution