



University of Venda

SCHOOL OF ENVIRONMENTAL SCIENCES

POTENTIAL IMPACTS OF CLIMATE CHANGE ON MYOSOREX SPECIES
AS A MODEL FOR EXTINCTION RISK OF MONTANE SMALL MAMMALS
IN SOUTH AFRICA

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Abstract

The work focussed on the potential impacts of climate change on *Myosorex* species endemic to South Africa. The study investigated the potential impacts of climatic variables (temperature and rainfall) on the distribution of *M. cafer*, *M. varius*, *M. sclateri*, *M. longicaudatus*, southern and northern lineages of *M. varius*, and *Myosorex cf. tenuis* from Limpopo Province in space and time. The study also investigated the *Myosorex* species occurring in Limpopo Province by using morphological analysis. Ecological niche modelling using Maxent was applied to predict current and future distribution of these species. Eight bioclimatic variables for current and future projected scenarios together with occurrence data from South African Museums, new field collections from Soutpansberg Mountains and published data were used to build the models. Equal sensitivity and specificity threshold was used to map suitable habitat and the number of resolution were counted to get the present and future range including percentage decrease or increase in range. The current distributions and the future distributions for all the species were compared to determine the range shifts. The model results for range shifts revealed that the more temperate species such as *M. cafer*, *M. longicaudatus* and *M. varius* will suffer high profound contractions while those from the subtropical or coastal lowland ranges (*Myosorex cf. tenuis*, and *M. sclateri*) will even increase the range of suitable conditions, but given their poor dispersal capability and the absence of suitable habitat such as forest in the new ranges, these increases may not be realised. The northern and southern lineages of *M. varius* will suffer minimal range contraction. *M. longicaudatus* showed greatest contraction of suitable habitats, consequently, will experience the highest risk of extinction, at least in some parts of its range as a result of global warming associated with climate change by the year 2070. The results showed that global warming is an important factor that results in range shifts, thus affecting the distribution of *Myosorex* species in South Africa. Morphological results indicate that the *Myosorex* occurring in Limpopo Province is a distinct species that may be called *Myosorex cf. tenuis*.

Keywords: climate change, *Myosorex* species, range shifts, extinction risks, Maxent