Conservation and Ecosystem Services

Small mammal responses to farming practices in central Argentinian agroecosystems: the use of hierarchical occupancy models

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Organic farming is more environmentally friendly than conventional agriculture, promoting greater levels of habitat heterogeneity. Field borders could be more suitable for biodiversity in agricultural anthromes. Small mammals are crucial in these anthromes due to their contribution to food webs and seed consumption. We used hierarchical multi-season occupancy models to assess the effect of organic versus conventional farming on multiple small mammal species in agricultural anthromes of central Argentina. We modelled detectability and increased precision of estimates, overcoming deficiencies of previous studies. Small mammals were seasonally surveyed in 70 field borders (conventional) and 63 (organic) during two years. We were able to include less frequent specialist species, detecting a positive relationship with organic management possibly because of higher habitat quality of borders. Vegetation volume was the most important explanatory variable in both managements. Species' richness was greater under organic management mainly in spring when the habitat quality differences with conventional management were the greatest. Spring is key for the rodent assemblage because of the beginning of reproductive period, when resource demand is important. We suggest that maintaining high quality border habitats, as those supported by organic management, could allow farmers to obtain economic profit while also contributing to biodiversity conservation. Considering the positive role that native rodents may have in some agricultural anthromes, the maintenance of high population numbers may be important for biodiversity conservation. The approach used in this study shows the importance of modelling imperfect detection, reducing bias in parameter estimates, and it should be implemented in similar studies.

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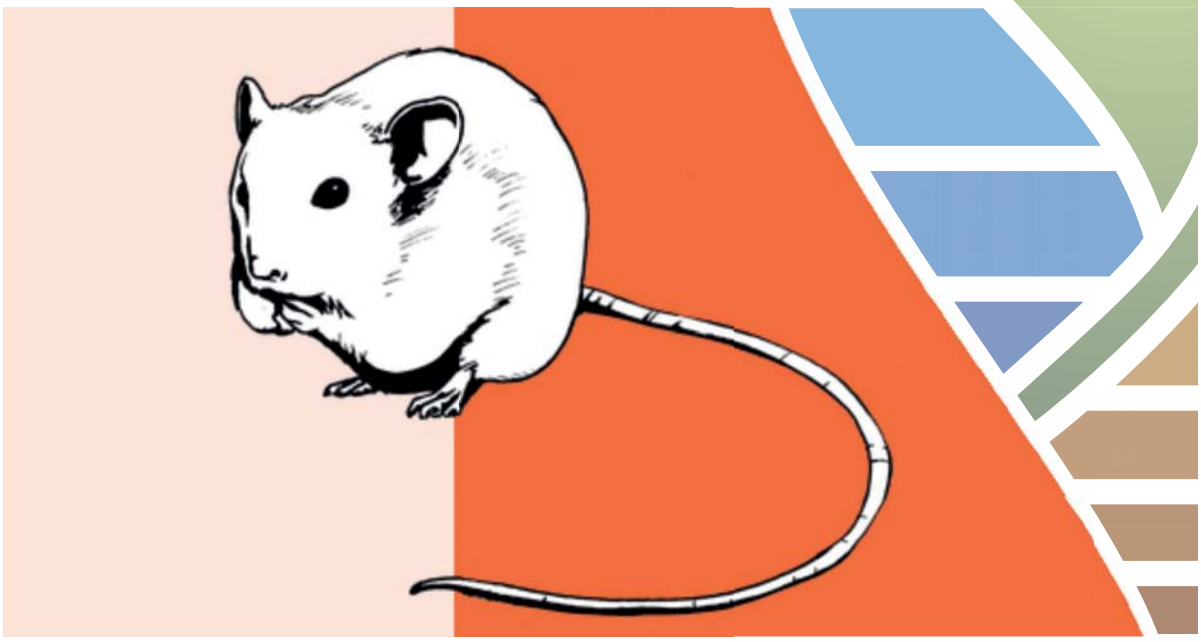

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