Ordinal Outlier Prediction Model for the Reconstruction of Badger Territories

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Abstract: In some areas of Great Britain, European badgers *(Meles meles)* can be a potential source of infection for cattle since they are a reservoir of the bovine tuberculosis which could cost £1bn over the next 10 years. The European badger is a territorial animal that uses indirect signs to mark its territory such as communal latrines. The aim of the research is to reconstruct maps of badger territories from data collected through bait-marking, where plastic markers placed in bait have been recovered after excretion and the spatial locations of latrines recorded. Latrines can be classified into three types: hinterland, boundary and outliers i.e. those from extraterritorial excursions. An Ordinal Outlier Prediction Model (OOPM) was developed to reconstruct the territories using cumulative logits to classify the type of latrine from information such as its location, types of other latrines in the same direction and other covariate information adjusting for neighbouring territories. This research extends previous work by estimating joint probabilities for different classification of latrines allowing the reconstruction of boundaries of territories with concave areas and quantifying the uncertainty in the reconstruction.

References

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