CENTRE FOR BIODIVERSITY AND ENVIRONMENTAL

RESEARCH

Prof. Rob Freckleton

Executive Editor

Methods in Ecology and Evolution

The British Ecological Society

Charles Darwin House

12, Roger Street

London, UK

WC1N 2JU

August 2014

Ref:

Dear Prof. Freckleton,

Here, we submit a manuscript entitled "A generalised random encounter model for estimating animal density with remote sensor data" by Tim C. D. Lucas, Elizabeth A. Moorcroft, Robin Freeman, Marcus J. Rowcliffe and Kate E. Jones to be considered for publication as a research article in Methods in Ecology and Evolution. There are four files in all: the main manuscript (), two figure files () and a file of electronic supplementary material ().

Estimating the size of animal populations is fundamental to ecology and conservation. Being able to monitor changes in animal population in response to anthropogenic pressure is becoming increasingly important as humans modify habitats and change climates in increasingly dramatic ways.

Methods do already exist for estimating animal densities, but these methods are not always suitable as they may require unknowable information. In this study we create a generalised random encounter model (gREM) as an extension to previously published work, which only requires count data collected by an acoustic detector, or camera trap to estimate absolute animal density. We assessed the accuracy and precision of our method within a simulated environment as a proof of principle that our model is both accurate and precise. We went further as to recommend best survey practice for estimating animal densities. The methods outlined in this paper are applicable for data obtained in both marine and terrestrial environments, from either visual or acoustic sensors, and potentially cover a huge range of animals (e.g., big cats, sharks, birds, bats and cetaceans). As sensors such as camera traps and acoustic detectors become more ubiquitous, the gREM will be increasingly useful for monitoring animal populations across broad spatial, temporal and taxonomic scales.

We confirm that this manuscript has not been previously published elsewhere, and is not under consideration by any other journal. All authors have approved this manuscript and agree with its submission to Methods in Ecology and Evolution.

Looking forward to hearing from you soon.

Best wishes,



Prof. Kate E. Jones

Chair of Ecology and Biodiversity

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