

## NEW ANALYTICAL METHODS FOR CAMERA TRAP DATA.

Natoya O.A.S. Jourdain<sup>a</sup>, Diana J. Cole<sup>a</sup>, Martin S. Ridout<sup>a</sup>  
Marcus J. Rowcliffe<sup>b</sup>

<sup>a</sup> School of Mathematics, Statistics & Actuary Science  
University of Kent  
Canterbury, England  
[nj64@kent.ac.uk](mailto:nj64@kent.ac.uk); [D.J.Cole@kent.ac.uk](mailto:D.J.Cole@kent.ac.uk); [M.S.Ridout@kent.ac.uk](mailto:M.S.Ridout@kent.ac.uk)

<sup>b</sup> Institute of Zoology  
Living Conservation,  
London, England  
[Marcus.Rowcliffe@ioz.ac.uk](mailto:Marcus.Rowcliffe@ioz.ac.uk)

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**Abstract:** To monitor animal populations, camera traps use fix cameras, which are triggered by infra-red sensors to ‘trap’ images of passing animals. Camera traps are commonly used for animals with individually unique markings where capture-recapture models can be used. We consider how camera trap data can be used for animals without these unique markings. The Random Encounter Model (REM), developed by Rowcliffe *et. al* (2008), models the underlying process between animals and camera traps, without the need for individual recognition of the animals. The REM describes the rate of contact between animals and camera traps, from which an estimator for animal density can be derived. The REM of Rowcliffe *et. al* (2008) models the trapping rate data and assumes a fixed value for animal speed of movement data, which is estimated as the average of the available data. We developed a maximum likelihood framework to model both data sets simultaneously, as this gives a more unified approach to estimation. We illustrate this method using data from a camera trap experiment at Whipsnade Animal Park (July, 2005), focusing on four species: Wallaby, Water deer, Mara and Muntjac. The method will be improved by adding covariates such as climate – temperature and rainfall, detection zone and camera. As the success of this technique is clearly dependent on a reasonable number of photographs, we explored the effect of increasing sampling effort on the precision of density estimates using simulation. The method will be applied to a larger dataset from the tropical moist forest of the Baro Colorado Island, Panama.

**References:** Rowcliffe, M.J. et al. (2008), Estimating animal density using camera trap methods without the need for individual recognition, *Journal of Applied Ecology* 45, 1228-1236.