ACCOUNTING FOR ANIMAL MOVEMENT IN SPATIAL CAPTURE-RECAPTURE

Panchaud, C. University of Edinburgh
King, R. University of Edinburgh
Borchers, D. University of St Andrews
Worthington, H. University of St Andrews
Durbach, I. University of St Andrews

Estimating wildlife populations abundance is essential for conservation and management. Capture-recapture surveys using camera traps are often used to obtain data sets which are then analyzed by methods such as spatially explicit capture-recapture (SECR) models. Traditional SECR introduces spatial correlation by assuming that animals are more likely to be seen near their latent activity center, providing more robust population estimates. However, SECR assumes that the probability of being observed at a trap depends solely on the (unobserved) activity center location and not on any previously observed trap locations. We argue that this assumption does not always hold, as it assumes that individuals may essentially teleport between consecutive sightings. We propose a new model that removes the teleportation by incorporating memory within a continuous time form of SECR model. This new model defines the density of the location of an individual via an OU process that depends both on the observed locations and the unknown activity center. We consider a simulation study in order to demonstrate the performance of the memory model before considering applications to real data, comparing the results with the standard SECR model.