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Design and analysis of large-scale spatial capture-recapture surveys

Spatial capture-recapture (SCR) surveys are widely used to estimate animal density and to understand why animals distribute themselves as they do. Increasingly SCR is used to sample large areas, with the aim of assessing density across a much bigger region than can be practically surveyed with one detector array. The standard way to do this is with multiple arrays ("clustered" detectors) and analysing the resulting capture histories using "multisession" analyses in which model parameters may be shared across the spatial sessions. This approach is ideal but assumes a high degree of coordination and data sharing at the design and analysis stage that may not always be present, for example if surveys are independently conducted by multiple teams and full sharing of capture histories is not feasible. In this talk I describe various cases that can arise, and for each provide a way to analyse the resulting data using SCR. A project assessing global snow leopard abundance across a range of some two million square kilometers is used as an example.