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Acoustic spatial capture-recapture animal density estimates

Spatial capture-recapture (SCR) models can be used to estimate animal density with acoustic survey data. However, SCR models traditionally estimate call density, then convert it to animal density via an independent estimate of call rate. Although it is possible to simultaneously estimate call density and call rate from a single acoustic survey alone, the only published acoustic SCR model assumes that animals remain stationary for the survey period. This assumption is particularly restrictive because many species move between calls. For example, acoustic surveys of gibbon groups often span multiple days, and these groups can call from a different location within their territories each day.

In this talk, I will present recent work on allowing movement between detected calls in acoustic SCR models, focusing on the application to gibbon calling surveys. This updated acoustic SCR model includes a bivariate-Normal distribution to allow call location dispersal about a territory location. I will then present how the updated model performs in estimating animal density, and other SCR model parameters, compared to other acoustic SCR models. Lastly, I discuss how this extension can facilitate animal movement modelling using the detected calls in an acoustic SCR context.