

Continuous time capture-recapture models

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Abstract: Motivated by field sampling of DNA fragments, we describe a general model for capture-recapture modeling of samples drawn one at a time in continuous time. Our model is based on Poisson sampling where the sampling time may be unobserved. We show that previously described models correspond to partial likelihoods from our Poisson model and their use may be justified through arguments concerning S - and Bayes-ancillarity of discarded information. We demonstrate a further link to continuous-time capture-recapture models and explain observations that have been made about this class of models in terms of partial ancillarity. We illustrate application of our models using data from the European badger (*Meles meles*) in which genotyping of DNA fragments was subject to error.