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The analysis of long-term ecological data sets.

I am a second year EPSRC PhD student, funded by a project grant from the NCSE.



I have so far been working on two long-term data sets: the first is from a 30+ year mark-recapture study of the Bighorn sheep found in the Canadian Rockies of Alberta and the second is from a 17 year study of the cheetahs on the Serengeti Plains of Tanzania. In both cases I have used mark-recapture methods to estimate survival and recapture rates.

Cheetahs: These animals are seen irregularly and may reproduce throughout the year and are therefore not agreeable to a traditional mark-resighting analysis using annual survival information. The data were instead modelled using monthly survival and resighting parameters and these were found to be different for cubs (0-1 years), adolescents (1-2 years) and adults (>2 years).

I have modelled heterogeneity in resighting using a spatial location covariate and I am now using multievent models to try to distinguish between the intrinsic and extrinsic sources of variation in the cheetah resighting rates.



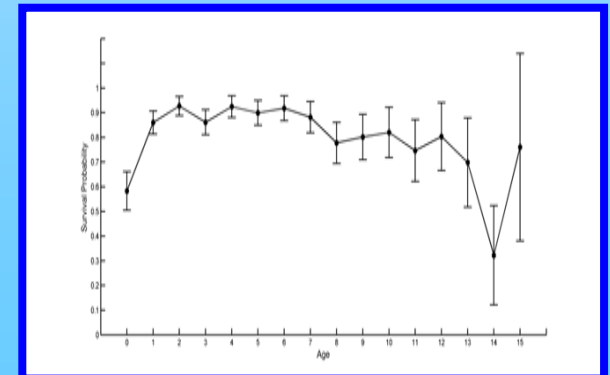
Muscat the Cheetah, Tanzania.



A Big Horn Sheep in the Rocky Mountains of Alberta, Canada.

Big Horn Sheep: I have investigated the effects of age (see graph), weight and breeding status on the annual survival probability of the ewes using both single- and multi-state models.

Weight was incorporated into these models by applying a new method developed at Kent for analysing life-history data with missing covariate values.



Annual survival estimates of ewes against age.