

Estimating wildlife population trends from incomplete census data

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Abstract: Understanding the dynamics of wildlife populations is fundamental to managing them. A wide range of methods to assess population trends are available nowadays, to suit many budgets and purposes. A common budget is small, and a common purpose is to assess rare species, which are characteristically difficult to get data on. Classical survey designs may not be applicable due to lack of observations, or lack of marks (natural or strategically added). Known aggregations provide the easy opportunity ability to count individuals, but such 'censuses' rarely fall into robust analytic frameworks or are true 'censuses' of the target population, i.e, they do not count every individual in the population of interest. Notwithstanding, aggregations may be the best or only way to estimate population trends in some cases. Using repeated census data at multiple sites, we developed simple methods to estimate population size and trend using a Bayesian framework. These methods consist of basic population models parameterized by MCMC estimation. . We demonstrate these methods with four critically endangered birds: white-shouldered ibises *Pseudibis davisoni* on roosts, and three species of vultures at carcasses (*Sarcogyps calvus*, *Gyps tenuirostris*, *G. bengalensis*). The methods have wider applicability and the potential to support decision making for other roosting, carcass-feasting, or otherwise predictably-aggregating species.

"will consider delivering lightning talk"