

# Two ways of counting bears

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## Abstract

In this thesis we investigate two different methods to estimate the Swedish brown bear population. Population estimates of this sort are often made with capture-recapture sampling in discrete-time, where each animal in the target population either is or is not captured on each sampling occasion. The data used to estimate the Swedish brown bear population consists of bear scats found continuously by hunters and volunteers, not on distinct sampling occasions. However, the data is then dichotomized into weekly binary capture histories where each week is regarded as one distinct sampling occasion on which each bear is regarded as either captured or not captured. This allows for the use of established discrete-time models but since there is no distinction made between a bear found one or ten times during a week, valuable information could be lost leading to a less accurate population estimate. An alternative approach is to use a continuous-time model based on the total number of scats found from each bear, without the dichotomization into weekly capture histories. The two models are compared with theoretical measures, simulation studies and computations on data. When applying the models to data and when investigating the theoretical measures, we confirm that the current method indeed results in a loss of information, which leads to higher variance in the population estimate. From the simulation studies however, we draw the conclusion that the current method is more robust towards overdispersion that arise when model assumptions are violated. The combination of these results indicate that the degree to which our model assumptions are violated could decide which method that is most advantageous.

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