



Largo E., Gaillard J.M., Festa-Bianchet M., Toigo C., Bassano B., Cortot H., Farny G., Lequette B., Gauthier D. & Martinot J.P. (2008). Can ground counts reliably monitor ibex *Capra ibex* populations? *Wildlife Biology*, 14, 489-499.

Although ground counts are often used to monitor ungulate populations, several studies show that counts of ungulates have low precision and often underestimate population size. We assessed the reliability of ibex *Capra ibex* counts as performed in French national parks, by analysing up to 23 years of annual censuses of six ibex populations for which a subset of animals were individually marked. We compared the population growth rate obtained from census data (estimated by use of four different methods) with the growth rate calculated from a demographic model including parameters estimated from capture-mark-recapture methods. The correlations between count-based estimates and growth rate obtained from demographic models were adequate to suggest that ground counts can monitor trends in population size of ibex, provided that the occasional undercounts are identified. Substantial undercounts in some years led to biologically impossible values of yearly population growth ($\lambda > 1.35$) and, in the longest time series available, to marked autocorrelations in counts. Managers should replicate counts within the same year to check for underestimated counts. To reduce errors, population biologists analysing time series of ungulate counts should check the plausibility of annual growth rates estimated from two consecutive counts.

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