

A comprehensive ground-based framework for quantification of human impacts on wildlife and habitat.

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Abstract

Ground-based monitoring of human impacts on wildlife and habitat is a critical component of conservation efforts, especially in biodiversity hotspots with significant human populations. Currently most efforts to monitor human impacts are limited to encounter rate indices, such as number of snares/km walked. However, such indices bear an unknown relationship with true impact prevalence because they do not account for imperfect detection, and are especially misleading when detectability varies spatially or temporally. We adapted a standardized detection-non-detection survey and a statistically robust framework to explicitly estimate detection probability and hence quantify the distribution and intensity of human impacts. We applied this framework in a multiple-use zone in the southern Western Ghats as a critical component of quantifying threats to connectivity for large mammals. Although very little evidence of poaching was detected during field surveys, our models indicate that 5 percent of the sampled area was impacted by it, a 110% increase from naïve estimates of poaching presence. Our results highlight the influence of human settlements on the prevalence of several human impacts over the landscape. Our approach combines simple, cost-effective field methods with a robust analytical framework to quantify impact prevalence, prioritize conservation efforts and evaluate their outcomes. It also provides conservation managers with an intuitive visual tool for adaptive management.