

Testing counts from vantage points as a surrogate for density estimates to monitor populations of Grey Parrot (*Psittacus erithacus*)

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In ornithology there is unanimous agreement on identifying *Psittaciformes* (parrots and cockatoos, commonly “parrots”) as the most endangered avian taxonomic group in the world. Most of parrots species inhabit tropical dense forest habitats and are primarily threatened by habitat loss due to human activity. Moreover, parrots are common pet species and therefore they are object of a multimillionaire mostly illegal trade business which takes tens of thousands of individuals from the wild. Grey Parrot *Psittacus erithacus* is one of the most popular avian pets due to its longevity and mimicry ability; it is currently spread all over central and western African countries, but most of the populations are decreasing because of the huge and constant harvest of individuals for pet trade. The decline is so clear that IUCN has recently listed the species as Vulnerable. Grey Parrot conservation – as well as other avian species conservation – strongly needs reliable methods for estimating threatened populations abundance; highly accurate population size estimates are crucial information to implement effective conservation programmes. In this work we examined accuracy of the vantage points counts method – a relatively easy and inexpensive method, frequently used for assessing parrots abundance and density in tropical forest habitats, that had never been reliably validated. We performed counts of Grey Parrots from several vantage points in the island of Príncipe, a small tropical island in the Gulf of Guinea which hosts a large population of Grey Parrot, showing the highest density across the entire range of the species. Results of vantage points counts were statistically compared with local densities obtained by distance sampling line transects – to date probably the most trustworthy and employed method for estimation of birds density since it accounts for detection probability (detectability). We found out that the two methods provide results which are significantly correlated: this suggests that the vantage points method is virtually capable of providing a good index of local Grey Parrots abundance. However, the selected models showed that parrots detectability is strongly influenced by the time of the day at which the count is performed and by the size of the surveyed area. The effect of these variables has to be taken into account by statistically modelling it or by improving the sampling design, in order to avoid biased counts. Moreover, it is possible that other environmental sources of variability affect parrots detectability, as the models do not explain the whole variability of the data, and therefore they are not capable to provide an accurate regression coefficient between counts and estimated densities.

Anyway, the small sample size urges caution on this hypothesis. Overall, our results foster to spend energy and time for refining the vantage points counts method, in order to provide an easy and reliable tool for monitoring Grey Parrot populations in Príncipe and elsewhere in the species range.