

- Preston, F.W. (1962) The canonical distribution of commonness and rarity: Part I. *Ecology*, 43, 185–215.
- Rosenzweig, M.L. (1995) *Species diversity in space and time*. Cambridge University Press, Cambridge.
- Rosenzweig, M.L. (2001) Loss of speciation rate will impoverish future diversity. *Proceedings of the National Academy of Sciences USA*, 89, 5404–5410.

- Scheiner, S.M. (2003) Six types of species–area curves. *Global Ecology and Biogeography*, 12, 441–447.
- Tjørve, E. (2006) Shapes and functions of species–area curves: a review of possible models. *Journal of Biogeography*, 30, 827–835.

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## update

# Extinct or extant? Woodpeckers and rhinoceros

Biogeographical research needs accurate data on the distribution of species. For many species this is exceedingly difficult to obtain, leading to a lack of global information collectively known as the Wallacean shortfall. Fortunately, new tools are being developed that allow conservationists and biogeographers to determine the existence of extant populations with much greater accuracy.

Foremost among these new tools is the increasing use of genetic analysis. This was recently used to great effect to confirm the extinction of the Javan rhinoceros (*Rhinoceros sondaicus annamiticus*) in Cat Tien National Park in Vietnam (Brook et al. 2011). Despite their enormous size, Javan rhinoceros are remarkably shy forest-dwelling animals that are difficult to see under natural conditions and were only rediscovered in mainland Asia in 1988. Given the difficulty of traditional surveying techniques, scientists from WWF and the Cat Tien National park had been monitoring the population by conducting genetic analysis of dung samples collected in the park between 2009 and 2010. The analysis indicated that all the dung belonged to a single individual, the body of which was found April 2010, thereby confirming the extinction of the population.

Of course, genetic analysis is costly, time consuming and requires some form of biological tissue (hair, dung, etc.). For many rare animals the only information that exists is the occasional sighting, the reliability of which is often highly questionable. Andrew Solow and his colleagues have recently come up with an ingenious method to account for this inevitable uncertainty (Solow et al. 2011). They use Bayesian (probability-based)

statistics to model changes in the rate of valid sightings and to assess the quality of uncertain sightings for the ivory-billed woodpecker (*Campephilus principalis*) in North America. The woodpecker was controversially rediscovered in 2005, but a lack of clear documentary evidence and the failure of subsequent intensive surveys have led many scientists to doubt the veracity of this claim. The Bayesian model applied by Solow to 68 historical sightings (29 of which were classified as uncertain) strongly suggests that the bird is indeed extinct, and the 2005 sighting was sadly a case of mistaken identity.

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## References

- Brook, S., de Groot, P.V.C., Mahood, S. & Long, B. (2011) Extinction of the Javan Rhinoceros (*Rhinoceros sondaicus*) from Vietnam. WWF Report. Available at: <http://www.worldwildlife.org/who/media/press/2011/WWFBinaryitem24584.pdf>
- Solow, A., Smith, W., Burgman, M., Rout, T., Wintle, B. and Roberts, D. (2011), Uncertain sightings and the extinction of the ivory-billed woodpecker. *Conservation Biology*. doi: 10.1111/j.1523-1739.2011.01743.x

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