

Unrealistic assumptions invalidate extinction estimates

Hubbell *et al.* (1) estimated the number of Amazonian tree species threatened with extinction due to habitat loss predicted under 2 development scenarios for the Brazilian Amazon (2). Unfortunately, their analysis suffers from several critical weaknesses that render the results suspect, if not meaningless, for conservation. Hubbell *et al.* (1) model species ranges as circles or ellipses, the areas of which are based solely on theoretical population abundances derived from the neutral theory of biogeography. As such, there is the implicit assumption of an invariant relationship between population size and range size. This is contrary to a central result of biogeography, that there are multiple forms of rarity (3) in which species can have low total abundances because of small ranges or because of low densities across large ranges. Hubbell *et al.* (1) also disregard the fact that many species have ranges extending beyond the Brazilian Amazon. Even facing a complete loss of habitat within the study region, these species will not automatically go extinct as assumed in Hubbell *et al.*'s calculations (1). Finally, Hubbell *et al.* ignore strong gradients

in Amazonian species richness (4–6), with diversity being highest in western Amazonia and along the Amazon River and lowest through the more seasonal Cerrado in southeastern Brazil. Predicted habitat loss is greatest in the Cerrado (2), precisely the area with the lowest diversity. This is all potentially good news for conservation but bad news for Hubbell *et al.*'s (1) analysis; by not incorporating well-established spatial patterns in species ranges and diversity, Hubbell *et al.* (1) almost certainly exaggerate species extinctions.

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