LETTER

Reply to Bode and Murdoch: A proper integration of species–area relationship uncertainties into return on investment analyses is needed

Conservation biologists need to investigate the consequences of accounting for uncertainties in species–area relationships (SARs) in cost-effective conservation planning (1). Although we illustrated the consequences of such uncertainties for the simple identification of species richness hotspots (still employed widely), we explicitly highlighted the breadth of conservation prioritization issues to which concerns about the underlying form of SARs were potentially relevant (2). We would, however, caution against any general inferences being drawn from the results of Bode and Murdoch's (1) attempt to incorporate uncertainties in SARs into return on investment (ROI).

First, Bode and Murdoch used bird species richness data for the 34 biodiversity hotspots. This represents a much cruder spatial scale of analysis than the data that we used (2). Moreover, while data are available for others, in using a single taxon Bode and Murdoch ignored the fundamental question of the robustness of ROI rankings to taxonomic group when taxonomic differences in the SAR are incorporated.

Second, by comparing the ROI rankings using just "the three best" convex-shaped SAR models in the results we reported, Bode and Murdoch did not actually integrate taxonomic SAR uncertainty into ROI analyses. Although our analyses concerned an entirely different dataset, other models provided a better fit for birds in a majority of biomes, and these models represent only a narrow range of the possible forms (2).

Finally, a proper integration of SAR uncertainty into ROI analyses would involve, among other methodological needs, the calibration of a "multimodel ROI relationship" for each of the 34 biodiversity hotspots and for several taxa, as well as the use of a comprehensive range of functional forms for ROI calculations.

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