
The Multifaceted Nature of Biodiversity Conservation: Reply to Leroux and Schmiegelow

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Leroux and Schmiegelow raise several key issues about our paper (Lamoreux et al. 2006) regarding global tests of concordance for species richness and endemism and their implications for conservation. Although we differ with Leroux and Schmiegelow over the importance of endemism, we agree with enough of their comments that we are left to wonder why these were offered as a critique of our work.

Leroux and Schmiegelow partition our global data set of terrestrial vertebrates into three categories of overall richness and find that, within each category, the richness of the groups shows little overlap. They conclude that “partitioning the data into richness categories seriously challenges the notion that a given vertebrate class can be used reliably as a surrogate for others.”

Although Leroux and Schmiegelow provide this analysis as a challenge to our work, we agree with their result: global correlations, especially those of richness, are of little practical use for conservation. And we said as much in the paper: “Global conservation priorities based on richness alone will overlook many endemic species.” We also noted that “although global correlations are suggestive of concordant diversity patterns, the question most relevant to conservation decisions is whether a specific set of ecoregions selected for one measure will represent nontarget species (Balmford 1998; Howard et al. 1998; Moore et al. 2003).”

In our paper we addressed this question by selecting ecoregions based on the number of endemics they contain and asking how many total species are also repre-

sented. Leroux and Schmiegelow’s approach is the opposite. They took all of the ecoregions that contain *no* terrestrial vertebrate endemics (280 total) and found that these hold 38.9% of all species. Although this analysis appears meant to emphasize the importance of these ecoregions for conservation, it accomplishes the reverse. For one thing selecting 280 ecoregions at random represents significantly more species (mean $73.1 \pm 3.7\%$ of all species). Selecting 280 ecoregions on the basis of endemism, as we did, represents 94.1% of all species (significantly better than random), and more than 6000 of the species are found nowhere else. More important, the species in the ecoregions that Leroux and Schmiegelow highlight, by definition, occur elsewhere; representing them in ecoregions that also contain endemics leads to efficient conservation planning (Margules & Pressey 2000).

Leroux and Schmiegelow’s final point is the one we agree with most of all: biodiversity is multifaceted. Ecoregions lacking endemic species in these four taxa are nonetheless important for the innumerable unique species from other taxa that live in them and for other conservation objectives, such as maintaining large wilderness areas and ecosystem services. Although we focused on endemism, we clearly acknowledge in the paper that “methods for setting conservation priorities are complex and should consider not just the number of endemics or total species present, but also degree of threat (Dobson et al. 1997; Myers et al. 2000), population viability (Groves 2003), ecological and evolutionary processes (Olson & Dinerstein 1998; Groves 2003), and economic costs and

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benefits of conservation (Balmford et al. 2002).” Unfortunately, the journal’s space constraints prevented further discussion even for such a crucial point.

We have spent much of our careers developing multifaceted measures of biodiversity to inform priority setting, including the Global 200 conservation priorities (identified on the basis of representation, ecological phenomena, richness, and endemism) and several boreal forest analyses and conservation strategies (Bonan & Shugart 1989; Bonan et al. 1990; Dinerstein et al. 1994, 1995; Kreever et al. 1994; Olson & Dinerstein 1998, 2002; Ricketts et al. 1999; Wikramanayake et al. 2002; Burgess et al. 2004; Ricketts et al. 2005). We appreciate Leroux and Schmiegelow’s comments for another opportunity to highlight the need to consider a full range of discriminators in identifying global and regional conservation priorities.

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