LETTER

Biodiversity and ecosystem functioning: Effects of the loss of salamander species richness

The effects of species loss on ecosystem processes has attracted substantial research effort over the last 2 decades (1, 2), partly motivated by rapid declines in global biodiversity. The value of this research to practical conservation is, however, limited (ref. 3, but see ref. 4), partly due to the lack of clear evidence from natural systems. In a recent study in PNAS, Rovito et al. (5) provide information that enhances our understanding of the potential consequences of biodiversity loss. They report dramatic declines of many species of salamander in Central America and Mexico between the 1970s and 2005–2007. Although not explicitly discussed in their article, Rovito et al. show that declines in species richness of salamanders (e.g., from 7 in the 1970s to 3 in 2005–2007, El Rincon site, see Table 1 in ref. 5) are associated with large declines in encounter rates: 6.2 salamanders per person per hour in the 1970s and 1.27 in 2005–2007 at El Rinco. If biomass is assumed to correlate with encounter rates, species loss has a negative effect on the production of biomass.

There is no data in the paper (5) to evaluate whether other species that were not included in the survey compensated for the large declines in the counted salamander species. Compensation or not is key to evaluate the ecosystem consequences of species loss. Provided there was no substantial compensation, the results presented by Rovito et al. provide strong evidence from the field that biodiversity loss can have serious consequences for ecosystem processes.

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