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Letters Response

Response to Kearney and Porter: Both functional and community ecologists need to do more for each other

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Kearney and Porter [1] have correctly identified one of our themes from our recent article in *TREE* [2]: community ecologists should pay more attention to, and make greater use of, functional (physiological) ecology. Kearney and Porter [1] cite several good examples of the kind of exciting, recently published studies in functional ecology that community ecologists would benefit from incorporating into their thinking. Other recent important efforts in energetics [3,4], stoichiometry [5] and biophysics [6,7] take different approaches.

In our paper [2], we made three other points that go beyond Kearney and Porter's point of identifying work in functional ecology that is of use to community ecologists. First, we emphasized three types of quantitative measures (traits, performance currencies and environment) and the need to explore all possible combinations of these factors. Thus, in addition to the combinations found in the work highlighted by Kearney and Porter, we emphasize, for example, exploring how traits vary along environmental gradients and which morphological traits link to which physiological traits. Second, we also emphasized exploring not only the fundamental, but also the realized niche processes (i.e. the interaction milieu or species interactions). Most of Kearney and Porter's examples [1] do not address these realized niche processes: for example, we encourage asking which traits affect species interactions and how do species interactions change with the environment? Finally, we emphasized a shift in approach away from ANOVA-based ecology towards looking at the mathematical relationships between quantitative measures of traits and environment. None of these three agendas necessarily requires

the types of physiological ecology put forth by Kearney and Porter [1]. These research agendas are currently still in a necessary pattern-finding phase and tend to not explicitly include any mechanism. The search for mechanism in these areas in the future might lead to Kearney and Porter's physiological ecology, but it could equally well lead to evolutionary ecology or behavior.

We suggest that functional ecology has not yet solved all of the needs of community ecologists. We addressed our paper to community ecologists and the changes that they need to make. The examples that we and Kearney and Porter provide not to the contrary, an equally long and necessary paper could have been written calling for select branches of functional ecology to pay more attention to community ecology [8] and thereby achieve more relevance to applications in conservation. We do not attempt this here, but briefly suggest that to achieve maximal usefulness and relevance to the larger field of ecology areas of functional ecology with aspirations to informing community ecology need to come out of the laboratory and into the field by:

- Becoming more comparative between species. Community ecologists study 5–200 species at a time. Physiological data need to have the same span.
- Placing more emphasis on measures of fitness that have an influence on the fate of the species over multiple generations, instead of focusing on factors such as instantaneous energetic requirements, leaf carbon assimilation rates, or single clutch size.
- Building more links between physiological traits and more easily measured, ecologically relevant traits. The links between metabolism and body size [2] and between carbon assimilation rates and leaf life span [9] are good examples that need to be expanded.

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- Exploring the functional ecology of species interactions. Much of physiological ecology has focused almost exclusively on single individuals, ignoring the physiological consequences created by intraspecific interactions (i.e. density dependence) as well as the effects of other species. In other words, most ecophysiology studies to date have only considered the fundamental niche processes and not the realized niche processes.

In conclusion, both community ecologists and functional ecologists would benefit from paying more attention to each other. Individual work in both fields does heed this call, indeed more often than we can cite. But as a percentage of all work done in community ecology or in functional ecology, work that bridges the two disciplines is still all too rare. Neither will community ecology find all of its answers in functional ecology alone, needing to also look to the fields of behavior and evolutionary ecology for mechanisms. We hope that community and functional ecologists will continue the dialogue found in our letter and that by Kearney and Porter [1].

Book Review

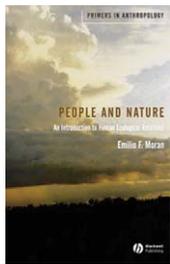
Thinking anthropologically about nature

People and Nature: An Introduction to Human Ecological Relations by Emilio F. Moran.

Blackwell Publishing, 2006. US\$67.95/£50.00 hbk, US\$27.95/£17.99 pbk (218 pages) ISBN 1405105712/1405105720

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One important trend in ecology over the past 20 years has been the increasing number of ecologists working at the interface of nature and society. Increasingly, we promise to save biodiversity with our conservation science; salvaging biodiversity, we suggest, will in turn help to preclude impending societal collapse [1]. However, translating science into real, honest-to-goodness conservation is tricky.

Actual conservation is done by complex people who exist in complex places and operate within complex institutions, and simple models of human behavior do not do these intricacies justice. Indeed, the difficulty of navigating cultural diversity is one reason why applied scientists can profit from the work of social anthropologists, human geographers and other social scholars. Nevertheless, there seems to be little in the way of mutual respect between these branches of scholarship, much less of productive collaboration. This is another arena in which we need more capable translators.

Emilio Moran is such a translator (his work spanned natural and social science before it was fashionable to do so), and his book *People and Nature* would be one place to start for scientists curious about what an anthropological

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outlook can offer ecology and its applications. The first in Blackwell's 'Primers in Anthropology' series, *People and Nature* is a whistle-stop tour through not only anthropology, but also ecology, economics, environmental history, geography, psychology and development theory. Moran reviews the evidence for 'our current environmental crisis', discusses various conceptions of human–environment relations, both within the ivory tower and across cultures worldwide, and concludes with his vision for a happier, more sustainable world.

Because of its breadth and its aim at non-specialists, *People and Nature* includes material that will be old news to most professionals (e.g. the litany of anthropogenic environmental problems), as well as simplifications that might irk specialists in a given area (e.g. ecologists might balk at occasional oddities, such as the perplexing claim that tropical moist forests are 'characterized by relatively low animal populations due to the costs of maintaining the complexity of the trophic levels operative'). There are also some interesting omissions. For example, Moran makes only fleeting reference to gender, despite the patent importance of gender relations in structuring human–environment relations and driving population growth in many parts of the world. I would also have been interested to see discussion of the staggering diversity of opinion within anthropology on human–environment issues, and of how the influence of Marxian political

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