

References

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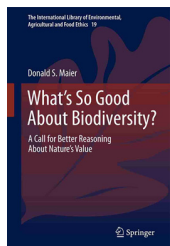
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The value of biodiversity: a humbling analysis

What's So Good about Biodiversity? A Call for Better Reasoning about Nature's Value by Donald S. Maier, Springer, 2012. US\$39.99/€26.74, pbk (568 pp.) ISBN 978-94-007-3990-1, US\$29.99/€20.22, eBook ISBN 978-94-007-3991-8

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Like many ecologists, I was drawn to ecology in large part by an abiding love of nature. To think that I could work outdoors (fun) and at the same time contribute to the understanding and thereby protection of nature (rewarding) was a huge draw. At the time, the mid 1990s, the concept of biodiversity had gained considerable momentum, and there was no question in my mind that

the more biodiversity in the world the better a place it would be for all. Biodiversity has immense value, period. Or does it? In *What's So Good about Biodiversity? A Call for Better Reasoning about Nature's Value*, Donald S. Maier analyzes this question in great detail.

A working definition of biodiversity is a key first step in every such discussion. On the surface, Maier's definition sounds rather arcane: 'a state of affairs in which there is a diversity of kinds within various biotic and biota-encompassing categories'. However, suffice to say that the number of species found in a given place and time (species richness) – the empirical basis of most biodiversity studies – fits the bill, and most of the arguments in the book are not overly reliant on this definition. Importantly, Maier does not allow, as some have done, for value to be built in to the definition, which would render any argument about the value of biodiversity perfectly circular.

No fewer than 12 theories of biodiversity value are described, although they fall into two major categories. First, we have a moral responsibility not to extinguish other species from the earth. Second, the loss of biodiversity will impair the ability of ecosystems to deliver the goods and services humans derive from it, such as medicines and clean air and water. As a moral philosopher and self-described environmentalist with scientific training, Maier scrutinizes each theory in almost excruciating detail, the sum total of which is difficult to summarize in a short review. To cut to the chase,

he describes being 'stunned' that he 'could not find a single argument that does not have serious logical flaws, crippling qualifications, or indefensible assumptions'. Ouch.

As one example, the argument that biodiversity is valuable because it benefits human health and well-being via ecosystem services is a target for considerable derision. First, the near absence of any accounting for ecosystem disservices (e.g., disease-transmitting insect vectors) makes the whole exercise one-sided. In addition, Maier argues that, if one wishes to maintain logical consistency in arguing for the value of biodiversity, one must commit to some rather discomfiting positions. Why not attempt to increase local biodiversity via the importation of exotic species or genetic engineering of new ones? If a particular service (e.g., food provisioning) is the accepted objective, why not accept alternative means of delivering this service, which may not involve any protection of biodiversity or even of nature more generally?

The book also points out that the biodiversity–ecosystem services argument is faced with some inconvenient empirical observations. For example, the vast majority of our food (clearly an important ecosystem service) comes from an exceedingly small slice of life on earth, and food production (i.e., agriculture) is probably the leading cause of habitat destruction and biodiversity loss. The risk of infectious disease is probably greatest in the most biodiverse places on earth (the humid tropics), perhaps because of such high biodiversity. The latter point echoes the ongoing scientific debate about links between biodiversity and human health [1–3] and, in one of the many surprisingly funny passages in the book, Maier jumps into the fray with a caricature of the premises (P) and conclusion (C) that some researchers have presented based on the observation (A) that biodiversity can reduce zoonotic diseases: 'P1: It is possible that A; P2: A is almost never true; C: Therefore, generally A'.

I found some aspects of Maier's treatment of the scientific literature wanting, such as his use of rare exceptions as grounds for dismissing a general pattern (e.g., a positive influence of diversity on productivity). His new approach to valuing nature (note the switch from biodiversity to nature), which he calls 'appropriate fit' and which involves a 'uniquely human relationship' with nature and just letting nature be on some parts of the earth, also did not resonate. In addition, scientists

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will find the length and repetitiveness of many arguments a bit of a slog.

Finally, although many people will no doubt disagree with Maier, I do think many of the overall conclusions – supported by compelling arguments – deserve serious consideration and demand a response from ecologists and conservation biologists. In particular, the fact that we started with a conclusion (biodiversity is valuable), and subsequently sought scientific support for it, should prompt serious introspection concerning the degree to which our biases have colored our conclusions. Maier's diagnosis of our arguments concerning biodiversity is one of 'culturally conditioned, uncritical acceptance and unhealthy disciplinary inbreeding' resulting in a serious

case of 'confirmation bias'. Not only have our biases colored our conclusions, argues Maier, but they have also led to 'tacit agreement among colleagues not to rock the boat of bad reasoning – perhaps out of fear that there is no other way to defend nature and its value'. Ouch again.

References

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