Humanity's Domination of Nature is Part of the Problem: A Response to Kareiva and Marvier

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Is the Pursuit of *Gold* Open Access Good for All Scientists?

Macilwain's astute article (*BioScience* 63: 7–11) on the status of open-access publishing is a welcome summary of recent developments and associated major issues being vigorously debated. One gets the strong impression that the big questions are centered on profits for the big corporate publishers and support for this from governmental and private granting institutions. The essay, however, does not explicitly mention the large number of research scientists, from all parts of the world, who are working with little or no grant support. For them, support for open-access publication can mainly come only from their own institutions or their own pockets. Traditionally, of course, this component of the scientific community depends heavily on publication through their professional societies and associated journals. If this route is phased out without the finding of some realistic alternative, this major segment of the scientific enterprise will be hard pressed to survive. We need to come up with a more comprehensive open-access scheme that accommodates all aspects of good science, not just the well-funded parts.

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Nothing New in Kareiva and Marvier

Kareiva and Marvier (2012) criticize Soulé (1985) and, more broadly, the field of conservation biology for an "inattention to human well-being"; for relying on "anecdotes or conventional wisdom" instead of evidence; for being "primarily focused on biology," which has led to misdiagnosis of problems and "ill-conceived solutions"; and for focusing "efforts solely on pristine places." These criticisms are based on misrepresentations both of Soulé's seminal paper defining conservation biology and of the field itself and are therefore misplaced.

As evidence that conservation biology does not pay sufficient attention to human well-being, Kareiva and Marvier point to "well-documented instances of human communities having been unjustly displaced and disrupted for the creation of protected areas." Although there are instances in which indigenous peoples have been displaced to create protected areas and although this is not a trivial matter, it is plainly not accurate to state that conservation has ignored issues related to human well-being. Soulé (1985) specifically noted that "any recommendations about the location and size of national parks should consider the impact of the park on indigenous peoples and their cultures, on the local economy, and on opportunity costs such as forfeited logging profits." Even a cursory search of the journal *Conservation Biology* produces dozens of articles focused on the costs and benefits to society from conservation. There are many examples in which conservation has benefited and been supported by indigenous people because it provided protection from resource extraction or development (e.g., CBC 2012), which are the primary causes of human displacement, not conservation (e.g., Robinson 2003).

Kareiva and Marvier's suggestion that conservation biology is not evidence based and relies on "anecdotes" fails to recognize the many bright and serious practitioners of conservation biology, who are publishing numerous papers and otherwise engaging in conservation based on solid evidence from experimentation and observation. Likewise, the charge that conservation biology is primarily focused on biology to the exclusion of other fields fails to recognize the prominent role of social scientists, philosophers, economists, and many other diverse practitioners in conservation biology, as is reflected by the diverse membership of the Society for Conservation Biology, for instance. Finally, the assertion that conservation is primarily focused on pristine places is simply false. The great majority of conservation work today is focused on both private and public lands subject to resource extraction, because conservation biology recognized decades ago that context matters and that conservation rises or falls depending on what happens in the matrix within which protected areas are embedded. Whether you call it *conservation biology* or *conservation science*, the tools of the trade have been growing for decades, and the field is far from being in stasis.

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Humanity's Domination of Nature is Part of the Problem: A Response to Kareiva and Marvier

In "What is conservation science?", Peter Kareiva and Michelle Marvier (2012) argue that "human domination is now so widespread and profound that it can no longer be ignored in any conservation decision" (p. 965). They note that in recent decades, human populations and the per capita consumption of energy and materials have increased immensely, whereas

"managed ecosystems increasingly dominate the planet" (p. 964) because of ever-expanding human economies. Their article raises a key question: Does true conservation require humanity to set limits to our domination of nature?

Kareiva and Marvier answer this question in the negative. None of their "normative postulates" involves limiting human demands on the biosphere, either as a matter of justice toward other species or as prudent self-interest. Conservation centered on keeping lands wild is "socially unjust" (p. 965), they assert, since it may move people off the land or reduce their economic opportunities. At no point do the authors acknowledge that people ever act unjustly by displacing other species or degrading their habitats, through road building, urban sprawl, farming new lands, and so on. Their ideology appears to reflect anthropocentric bias grounded in human exceptionalism.

Similarly, Kareiva and Marvier admonish conservationists to compromise on conservation objectives in the interest of economic development and not to oppose corporate expansion generally; we should do our part, they imply, to expand humanity's already immense wealth and consumption. They fail to recognize that economic growth itself is the primary force driving global environmental crises such as biodiversity loss and the destabilization of the Earth's climate.

We propose that a mature conservation ethic would recognize and accept limits to growth and would ratchet back human domination of the biosphere, rather than embracing it. Such an approach involves gradually and noncoercively reducing human numbers and deemphasizing economic growth as a goal, especially within countries that are already sufficiently wealthy. It means a more equitable distribution of wealth, setting aside more parks and protected areas for nature, and redoubling existing efforts to limit human damage to all lands and waters. We believe that this approach is more just and more prudent than humanity's current self-centered rush to overpower and control nature. It stands a better chance of allowing people and the rest of the living world to flourish over the long term.

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Shared Conservation Goals but Differing Views on How to Most Effectively Achieve Results: A Response from Kareiva and Marvier

It is important to isolate the genuine disagreements laid out by Greenwald, Noss, and their respective colleagues. Greenwald and colleagues misinterpreted our overview of conservation science (Kareiva and Marvier 2012) as prescriptive, when in fact it was primarily descriptive of how the field has developed over the last 30 years. We asked, "What is conservation science?" and not, "What should conservation science become?" We agree with Greenwald and colleagues that conservationists are increasingly examining the costs and benefits to society, incorporating perspectives from the social sciences and humanities, and focusing on lands subject to resource extraction. Moreover, when we emphasized the need for evidence-based conservation, it was precisely because we do value "solid evidence from experimentation and observation." The point of evidence-based conservation is to use a weight-of-evidence approach to understand which practices are most successful under what conditions and to then use the findings to guide conservation practice.

Another false disagreement arises when Noss and colleagues chastise us for saying that humans need not set limits to our domination of nature. In fact, we stated the opposite: "The ability of nature to recover… does not provide humans license to inflict unfettered environmental damage." Noss and colleagues miscast our discussion of how to motivate good stewardship of nature and the suggestion that working with corporations might better manage the ill effects of economic activity as an ethical debate. We were not attempting to develop a "mature conservation ethic"—a task that we would leave to environmental philosophers. Instead, we were advancing the testable hypothesis that major conservation benefits will accrue from working with, rather than against, corporations. Similarly, when we point out that moving people off their land can backfire, this is not a call to abandon the protected-area strategy. It is an observation and a prompt both to improve protected-area strategies and to supplement them with interventions focused on the spaces between protected areas, as many conservation groups are doing.

However, not all of the disagreement is contrived. Noss and colleagues besmirch compromise and see a dichotomous choice in which society will either protect nature or advance human well-being. We reject the inevitability of this choice. Increasingly, conservationists are finding synergies where once we saw only trade-offs. Just as one example, the Gates Foundation's Reinvent the Toilet Challenge seeks sustainable sanitation solutions that could not only reduce disease but, if they are deployed in coastal communities of the Caribbean, could also reduce pollution that kills coral reefs, thereby benefiting both