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Good (and not so good) reasons to conserve biodiversity

Defending Biodiversity. Environmental Science and Ethics by Jonathan Newman, Gary Varner and Stefan Linquist 2017, Cambridge University Press, 442 pp., ISBN: 978-1139024105, <https://www.cambridge.org/>

When it comes to preserving the world's biodiversity, science will only get you so far. As Kareiva and Marvier (2012, p. 962) point out, "conservation will be a durable success only if people support conservation goals". In other words, it is not enough to understand the "how" of conservation, we also need to understand and appreciate the "why". This is because conservation is the expression of people's desire to preserve the elements of the natural world that they value (Ladle et al., 2011). Of course, different people hold different 'values', and while some might be motivated by the economic worth of a species or landscape, others may be driven by moral concerns about the treatment of sentient animals or an appreciation of nature's aesthetics. Unfortunately for conservation, there are many economically worthless, non-sentient, ugly species in the world, so we are going to need some better arguments if we are going to persuade the environmentally skeptical or simply disinterested to support our cause.

While *Defending Biodiversity* by Jonathan Newman, Gary Varner and Stefan Linquist may not supply a definitive argument for conserving biodiversity, it does provide a remarkable (and sometimes surprising) critical appraisal of all the commonly used arguments for why preserving nature is important. After a brief introduction that outlines the common beliefs and assumptions of the contemporary environmental agenda, the book is equitably divided between and analysis of instrumental value arguments (that we ought to conserve biodiversity because it is valuable to humans) and intrinsic value arguments (that we ought to conserve biodiversity because it is the morally correct thing to do). I found the instrumental defense section particularly fascinating, with chapters addressing ecosystem functioning and stability, the precautionary principle, agricultural and pharmaceutical benefits and nature-based tourism and transformative value. Perhaps the most striking aspect of these chapters is the flimsiness of the evidence that supports some of the most routinely used arguments for conservation. This is particularly the case of the superficially attractive argument that biodiversity should be conserved because it is in some way required to maintain ecosystem functions and the essential services that these functions support. Given the over-riding importance of the ecosystem services narrative for international conservation policy, the lack of robust empirical support is both surprising and worrying.

Other instrumental arguments do not fare much better. For example, the very widely cited precautionary principle is used as both a justification for why we should conserve biodiversity and as a heuristic guide for conservation management decision making. However, conserving a species because it might be useful at some point in the future or postponing a land management strategy because it might 'harm' biodiversity are remarkably difficult to operationalize and implement. These problems stem from the rarely acknowledged reality that making wise decisions in the absence of information is almost impossible. Indeed, faced with limited information techniques such as ecological risk assessment or cost-benefit analysis offer a much better approach for conservation planning than the precautionary principle because they can factor in both the benefits of particular actions and the potential opportunity costs of doing nothing. However, as Newman and his colleagues point out, the biggest problem with the precautionary principle is its probably its lack of conceptual clarity, which severely hampers its application in real-world situations.

The second part of the book is devoted to intrinsic value defenses of biodiversity conservation and contained some examples that may be less familiar to many science-based conservationists than the more utilitarian arguments of the preceding chapters. The main arguments covered in this section are conservation based on whether species are sentient (are capable of feeling pain/distress), the intrinsic value of ecological 'wholes' such as ecosystems or species, and the aesthetic value of species and natural places. Their discussion of conservation based on judgements of beauty is particularly insightful, with an entertaining and excellently written analogy between the appreciation of fine art and beautiful species and places. However, perhaps the most surprising aspect of this section is the strength of, and support for, arguments for conserving sentient species, providing an interesting bridge between animal rights and biodiversity conservation.

After this meticulously argued and forensically analyzed review of the reasons to conserve biodiversity, it was perhaps unsurprising that no single argument gives conservationists carte blanche to protect and/or restore. Though this conclusion is well justified and strongly supported, I couldn't help reflecting on the many times during my career that I have been tasked with persuading environmentally skeptic audiences of the need for conservation. Most of these people

would have no time for intrinsic value arguments such as the protection of sentient species even if they do have more robust philosophical foundations. Indeed, it is not clear whether the logic and empirical support for an argument plays much of a role in whether someone supports a given conservation action or the conservation agenda generally. The authors are aware of this and recognize that many environmentalists will be disheartened or even irritated by their dismantling of many of conservation's sacred cows – the final chapter is followed by the personal reflections of the authors, revealing a healthy level of uncertainty and awareness of real-world conservation challenges.

Of course, the lack of a universal argument for conservation does not mean that there are no good arguments for conserving biodiversity. Rather, there is no “one-size-fits all” justification and that, depending on the circumstance, it may sometimes be ethically preferable to introduce an exotic species, modify a pristine ecosystem or remove a rare species. As the authors are quick to point out, not a few conservationists may find these conclusions unpalatable, although it is hard to argue with their excellent analysis and impeccable logic. Moreover, in a field more prone than most to dogmatic views and unsubstantiated beliefs it was refreshing to read an unbiased and impartial analysis of some of our most closely held beliefs and principles.

The way the book is structured and the clarity of the text and illustrations makes it an ideal candidate for a course text-book for undergraduate or masters students or as essential reading for discussion groups/tutorials on environmental ethics. It should also appeal to more seasoned conservationists and researchers who would like to clarify their thinking and sharpen their arguments in the face of increasing public and political opposition to the conservation movement in countries such as the US and Brazil and its associated consequences such as protected area downgrading, downsizing and degazettement.

Finally, from a biogeographical perspective one of my recurring thoughts as I read the book was the apparent paucity of large-scale data on how people and cultures value natural areas and species. Indeed, in our recent review of shortfalls in large-scale knowledge of biodiversity (Hortal et al., 2015) we didn't consider human interactions with biodiversity as either a major shortfall or a sub-category of the Eltonian shortfall (lack of knowledge about interactions among species or among groups of species). Thus, from an instrumental perspective, we have very patchy knowledge about, for example, which animal species are kept, hunted or

eaten and how this has changed over time. Likewise, although it is self-evident that some species are more aesthetically appealing than others, to date our attempts to quantify this have been small scale and local (Lišková & Frynta, 2013). This may be about to change with the advent of increasingly sophisticated big data approaches to studying, quantifying and mapping human interactions with nature (Ladle et al., 2016; Davies et al., 2018). Whatever the philosophical justification, defending biodiversity will be whole lot easier when we better understand how people interact, use and value the nature that they know.

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