**Sharing Conservation Burdens Fairly**

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Abstract

We examined how, from the point of view of justice, the burdens of paying for conservation should be shared. I resisted simple answers to the question of who should pay for conservation that lean on a single moral principle. I identified 3 relevant principles that relate to who causes conservation challenges, who has greater capacity to carry burdens, and who stands to benefit from conservation. I argue for a distinctive pluralist framework for allocating conservation burdens that grants a proper role to all three principles, and describe a multistep process for putting the framework into practice.

Introduction

Article 6 of the 1972 World Heritage Convention states that the natural world “constitutes a world heritage for whose protection it is the duty of the international community as a whole to co-operate.” That is an admirable ideal. But international schemes to pool conservation costs are chronically underfunded (Balmford & Whitten 2003; Bruner et al 2004). In the absence of adequate international financing, the citizens of each state are required to pay to conserve the resources within their borders. This is regardless of their ability to meet those costs and the fact that conservation often delivers significant benefits to outsiders. This situation leaves many poor communities facing a tragic choice between conservation and economic development, and conservation often takes a back seat (Sanderson & Redford 2003). At the same time, the protection of precious resources that fall outside the borders of any state – such as those of the High Seas – often ends up being nobody’s responsibility.

Improving the international allocation of conservation costs should therefore be an urgent priority for anyone interested in either conservation or global justice. One important political question concerns the mechanisms that would allow humanity to make concrete progress toward a fairer allocation of the costs of conservation. But even if that problem could be solved, more precise moral guidance on where the costs of conservation should fall would also be required. It is objectionable to leave conservation costs to poor communities (Sanderson & Redford 2003). But what would a fair distribution of burdens look like?

An account of distributive justice may help identify the best moral principles for sharing benefits and burdens (Kymlicka 2002). Elsewhere, I set out a general theory of natural resource justice that can help guide answers to this question (Armstrong 2017). I argue that the benefits and burdens flowing from the world’s natural resources – including the burdens of conservation – should be shared in such a way as to reduce, rather than deepen, global inequalities. Rather than describing this theory, here I sought to provide a diagnostic framework for assessing how to allocate conservation costs. In practice, conservation can be complex, involving overlapping challenges and multiple actors, and the effects of one’s actions may be quite uncertain. Applying the framework to specific cases requires one to navigate complex questions about, for instance, agents’ capacity to bear costs and their causal contribution to ecosystem damage. Although engaging with such complexities is not easy, being clear about the underlying principles is nevertheless essential if conservation burdens are to be allocated fairly. I developed the framework to clarify the principles that are relevant to sharing conservation costs and a multistep procedure for integrating them.

A clear ethical framework is important for several reasons. First, it is important for conservation practitioners and policy makers to be clear about the ethical underpinnings of their policies so they can make responsible decisions (Mitrani et al 2018). This requires an informed position on the fair distribution of conservation costs. Second, cooperation with conservation efforts is likely to be higher if it is believed that the costs of those efforts are being shared fairly. By contrast, burdening those who can ill afford, and do not deserve, to bear costs diminishes cooperation with vital conservation efforts. Clarity about the best moral principles for sharing costs is therefore required. Third, those who may be prepared to fund conservation efforts should understand the precise nature and source of their ethical obligations. The fact that international conservation programs are chronically underfunded often reflects a view that participation in financing these schemes is morally optional. I considered reasons for resisting this idea. There are good grounds, in fact, for believing that greater international sharing of conservation costs is required by justice.

Allocating Conservation Costs

Conservation is a broad category which can encompass several different types of action or inaction (Del Corral 2015). It can involve protecting something – such as a precious resource - from a threat which would destroy or degrade it. It can involve repairing the damage done when some such threat comes to fruition. And, it can involve simply refraining from interfering with some resource, so that it can continue to perform its function within an ecosystem. All these varieties of conservation will lead to someone somewhere incurring costs, whether financial or otherwise. Acts of protection and restoration – such as restoring the balance of ecosystems or nurturing threatened species back to sustainability – sometimes threaten to monopolize society’s attention. But often the most important thing to do with regards to some precious ecosystem is to leave it alone. Here too someone may incur a kind of cost: the opportunity cost involved in refraining from taking up economic opportunities that would otherwise be open to them. These opportunity costs are sometimes marginalised in analyses of the costs of conservation, which often focus on the direct costs of implementing conservation schemes. But in many real-world cases opportunity costs are an absolutely central issue, not least in a context where much of the world’s biodiversity is located in tropical regions that are also home to endemic poverty. Our biggest international challenge, in many cases, is how the poor’s right to develop can be protected alongside the achievement of effective conservation (Rosales 2008).

I considered key features of the status quo – according to which conservation costs tend to fall on locals, if they are picked up at all - and assessed why the status quo is not just. I propose that 3 principles play a role in guiding the allocation of conservation costs.: These focus respectively on an agent or group of agents’ contribution to threats or damage to natural resources; their capacity to bear costs; and the degree to which they benefit from conservation. Advancing conservation justice means giving appropriate weight to each of these principles. I considered how they can be integrated together to provide guidance on the fair sharing of costs.

Why justice requires the international sharing of conservation costs

At present rates of decline, the world’s gorilla populations are seriously threatened with extinction. The Eastern Lowland Gorilla (Gorilla beringei graueri), for instance, is critically endangered; there are probably no more than 10,000 individuals living (Strindberg et al 2018). An estimated 80% of the world’s population of gorillas lives in the Democratic Republic of the Congo, a country blighted by poverty and a legacy of civil unrest (Walsh et al 2003). If the species is to be protected and populations restored, there will be significant costs attached. Illegal poaching must be prevented (at considerable financial cost) and habitat loss slowed (with an opportunity cost for those who would otherwise benefit from deforestation). But who, if anyone, should pay? Internationally, it is frequently declared that the habitat of these gorillas must be protected. The world’s most precious natural resources have increasingly been designated as being the “common concern of humankind,” even if they fall within one nation’s borders (Baslar 1998). There are even a number of efforts, led by international nongovernmental organisations, to share in the costs of protecting them. But these efforts remain the exception rather than the norm. For the most part, it is left to locals to pick up the costs. This is especially likely to be the case when it comes to the opportunity costs associated with conservation (Bamford & Whitten 2003). If locals do not carry the burdens associated with conservation, then no one will.

This practice of letting costs fall where they fall, however, generates considerable injustice. It is not actually clear why the mere fact of geographical proximity, by itself, should be considered relevant to the allocation of costs at all. Is there not a certain arbitrariness in asking those who happen to live near a particular ecosystem to bear the costs of protecting it, regardless of whether they are actually the agents responsible for endangering it in the first place, for instance? It might be argued, in response, that even if geographical proximity in and of itself is not morally important, there is a sound pragmatic case for leaving each nation-state to pay the costs of conserving domestic resources. Recent developments in international law have increased the emphasis placed on states’ duties toward natural resources, including duties of sustainable use (Schrijver 1997). If each state is capable of funding effective conservation, then, it might be argued, international sharing does not appear to be required.

One problem with such a pragmatic, state-led approach is that it would not actually cover a range of important conservation challenges. In areas such as the High Seas, Antarctica, and parts of the high Arctic, there is simply no local nation-state to depend upon. Conservation must by definition, therefore, be an international effort. In cases where migratory species that regularly cross national borders need conservation, moreover, some kind of international coordination will be required (Mancilla 2016), and this will plausibly involve some form of cost-sharing. In all these cases, principles for international cost-sharing are needed.

But even in cases where precious resources fall neatly within nation-states, allowing the inhabitants of each state to pick up the tab for conservation is surprisingly difficult to defend. There are, I argue, 3 considerations that are morally relevant when it comes to allocating conservation costs. But none of them has anything to do with geographical location or national membership as such. First, who, if anyone, has caused a threat to a resource or a species such that it requires conservation. Contribution to threats will often be morally relevant when conservation costs are allocated. But threats to resources or ecosystems will often arise from activities that take place outside of a nation’s borders or from activities (such as greenhouse gas emissions) that have a truly global impact.

Second, what are the capacities of different communities to bear costs without undergoing excessive sacrifices? The capacity to bear costs varies widely between communities, and leaving local communities to bear conservation costs will require sacrifices that some of them can ill afford. The Democratic Republic of the Congo, for instance, is described by the United Nations as one of the world’s least developed countries, with a per capita income per year of US$481 in 2018. Conservation projects must compete, here, with the fight to escape desperate poverty, whereas other societies may have much greater capacity to bear burdens.

Finally, who stands to benefit from acts of conservation? Sometimes, it is locals who will benefit. But in many cases, ecosystems deliver significant benefits to outsiders too (Balmford & Whitten 2003), from the role of forests in regulating the global climate to the provision of water, oxygen, and nutrients by key ecosystems. Many of these serve as global public goods. To require local communities to foot the bill for conservation in many cases amounts to asking the global poor to subsidise the lifestyles of the globally wealthy. In a highly unequal world, such a policy is hard to justify.

The pragmatic argument for letting conservation costs fall to local citizens faces three major challenges. It does not adequately reflect the frequent mismatch between the location of a resource and the origin of a threat to that resource; it is ill-suited to a world in which there are massive international inequalities in the capacity to effectively advance conservation goals; and it neglects the frequently poor fit between those who will be asked to pay for conservation and those who will benefit from it. Progress in sharing conservation costs globally has been very slow in practice, but justice demands a much more systematic sharing of conservation burdens. Whereas mere geographical proximity does not appear to track anything of moral significance, who caused threats, who has the capacity to bear conservation costs, and who will benefit from acts of conservation appear highly relevant.

Contribution to the problem

If the reason a species or an ecosystem is under threat is that it is being degraded or destroyed by someone, then it makes intuitive sense to ask that person or group of people to pick up the tab for restoring it to health. The so-called contributor pays principle places costs on the shoulders of whoever is responsible for damaging conservation-worthy objects. We often hold people remedially responsible for rectifying problems when they have played a significant causal role in bringing them about (Miller 2007). The principle is familiar from discussions of climate justice, where it is frequently argued that heavy emitters ought to bear the lion’s share of the costs of mitigation. The argument runs along the lines of ‘you broke it, you fix it’ (Shue 2014).

The contributor principle taps into the idea that humans are moral agents, capable of making choices, and that – at least when certain conditions are in place – it makes moral sense to hold us responsible for those choices (Dworkin 2000). There is also the question of incentives to consider. If people are going to be held responsible for meeting the costs of conservation efforts required by their own damaging actions, they will, one assumes, be less likely to cause damage in the first place. But to apply the contributor pays principle to contemporary conservation challenges, one needs to know a little more about the circumstances in which the relevant damage has been done. It makes moral sense to hold people responsible when they understood the possible adverse consequences of their actions and could have acted otherwise without facing unreasonable costs. Where those conditions are met, there are moral grounds for placing greater burdens on the shoulders of those who have generated threats to the health of ecosystems or species. For instance, if the reason an ecosystem is threatened is that somebody has recklessly and unnecessarily used a dangerous pesticide nearby, the contributor pays principle will hold them responsible for any clean-up costs.

The contributor pays principle is a very familiar moral principle, and plays a major role in legal systems around the world. For instance, Article 32d of Switzerland’s Federal Act on the Protection of the Environment (1983) declares that those responsible for causing pollution are obliged to bear the costs of remediation. In cases where there is more than one responsible actor, it continues, each should bear costs in proportion to their share of the responsibility. The Canadian Environmental Protection Act (1999) also requires polluters to bear clean-up costs. There are, to be sure, some cases which have a more complex structure. One complexity concerns risks. In principle, one could hold agents responsible not only for the consequences of their actions, but also for managing the risks of their actions. But in many cases risks will be rather uncertain, and if they are one would need to turn to some form of precautionary principle (Gardiner 2006). Another complexity concerns the diffuse effects our actions can have. In the law, one is typically required to make good the particular damage one has caused. But sometimes it is very hard to unpick the specific damage someone has done. In cases where it is nevertheless certain that someone has made damage more likely, it may make moral sense to require them to share in the costs of conservation in general.

There are, however, cases where the contributor-pays principle does not appear well equipped to offer guidance on how to share costs (Caney 2010). First, there will be cases where the reason conservation is required has nothing to do with human action. If the threat in question is not anthropogenic, one will need to turn to some other principle for guidance (and if the threat is only partly anthropogenic, the principle will give only a partial answer to our question about conservation burdens). Second, conservation problems may have been caused by people who are no longer alive. Perhaps past generations engaged in the most wanton habitat destruction. If so, we cannot now make them pay the price of putting it right. One can only ask current generations to foot the bill for what they have themselves done. Finally, there will be cases where the people who caused the damage were not aware of the consequences of their actions or had no reasonable alternatives to acting in the way they did. In all these cases, one needs to turn to one of the other principles to allocate costs.

Capacity

When a community faces a common problem, it will often turn to considerations of capacity when deciding who must bear the burdens of responding to it. The capacity- or ability-to-pay principle suggests that whoever can bear greater sacrifices without unduly setting back their interests should do so (Shue 2014). The principle is attractive to those who care about equality because it asks more of those who have more and avoids putting still greater burdens on those who are faring badly. As such, it will not intensify existing inequalities (Armstrong 2017). But it can also appeal to those who care only about poverty, insofar as it protects those who can ill afford to contribute to dealing with shared problems. It seems particularly important to keep the capacity to bear sacrifices in mind when laying burdens at one agent’s door would compound existing disadvantage, preventing them from escaping poverty or pushing them further into it.

Something like the capacity principle is the basis of the proportional and progressive taxation systems operated by most contemporary states, wherein people with higher incomes contribute more to the provision of public goods and other services. For the principle to work, of course, some reasonable index must be provided along which to measure different levels of capacity. Globally, for instance, some index that factors in gross domestic product per capita or levels of human development’ could be used to identify individuals or countries that are most able to bear conservation burdens (Moellendorf 2014). If it can, the capacity principle can offer powerful guidance when it comes to allocating conservation burdens.

Benefiting from conservation

The final principle for allocating conservation burdens suggests that those who benefit from conservation should pay more of the costs. It is widely accepted that when one consumes public goods, one develops an obligation to share in the costs of their production. This argument can be qualified in light of people’s different capacities to bear costs: those on low incomes are typically, and rightly, exempted from paying for many public services. But people who happily consume public goods and then refuse to bear any of the costs – even though they are perfectly able to - are regularly condemned for being free-riders. A similar argument can be made in the case of conservation. Often, the protection of vital ecosystems means that important ecosystem services continue to be used both locally and globally. If so, then people can be described as free-riders if they refuse to share in the costs involved in protecting those ecosystems.

Some political philosophers argue that one cannot be obliged to pay for benefits one has not asked for or does not even want (Nozick 1974). The argument that people should pay is much easier to make in cases where they need the services in question (Klosko 1987) and someone is inevitably going to incur costs in producing or protecting them. This is certainly true in the case of ecosystem services that are vital to human survival and the broader ecosystems in which people live. One important example would be the role of the world’s forests in sequestering carbon. When communities take steps to conserve forests, they allow people to emit more carbon dioxide than they otherwise could, assuming that one wants to preserve a safe climate. If the sink capacity of the forests were lost, the transition away from carbon would have to happen much faster and would likely be much more costly. If protecting forests from various threats means someone will have to carry costs, then it appears that those who benefit from carbon-intensive activities ought to share in those costs and that high emitters of greenhouse gases ought to bear greater costs than low emitters. For outsiders to refuse to share in these burdens simply because the forests in question fall within someone else’s national borders, is to free-ride on states with forests (Armstrong 2016).

Against a simple approach

The difficulty for those concerned with the fair or just allocation of conservation costs is that all 3 principles appear to be powerful and important. If so, it appears unlikely that a fair allocation of costs can be guided by any one principle alone. Such simple approaches have been suggested. For instance, it has been argued that those who benefit from conservation should be the ones who pay for it (Bamford & Whitten 2003). This is in many ways an attractive principle on its face. In practice global conservation efforts often involve people in poor countries being asked to protect resources that then deliver ecosystem benefits to people living in wealthy countries – who are not required to pay. Contributions to the conservation costs incurred in poor countries are basically voluntary in nature, and hence international sharing is patchy at best. The rich may sometimes feel they ought to share in conservation costs, but if they prefer not to, they are not obliged to do so. If conservation nevertheless occurs, they can continue to enjoy these benefits for free. The claim that from the point of view of justice, beneficiaries of conservation should share in conservation costs is quite powerful in such a context.

But the moral picture is a little more complex. Consider the following two examples that combined show why the question of who benefits from conservation cannot be the entire story. Consider a country such as Somalia, one of the world’s least developed countries. Somalia initially depends on sustainable artisanal fishing for the livelihood of thousands of people and the nutrition of many thousands more. Fish stocks in its Exclusive Economic Zone collapse, however, due to illegal and unreported fishing carried out by boats from better-off countries. The local state, unfortunately, lacks the capacity to enforce restrictions on fishing so that stocks can recover. Now imagine that some (hypothetical) international agency steps in and drives out illegal fishing. Who should pay for its efforts? According to the principle that the beneficiaries of conservation efforts should pay, Somalia would carry the costs because conservation will secure the livelihoods of its fishers. It will be, that is, the chief, and perhaps the only, beneficiary of conservation. But this conclusion is morally troubling because it is not the Somali fishers who caused the collapse of the stocks. In this case, justice suggests that those who contributed to the problem – the perpetrators of illegal overfishing - should be the ones to pay. And, this is so even if they will not benefit from conservation themselves. An approach that focuses on benefits from conservation alone, wrongly neglects facts about contributions to the problem.

In the second example, a country establishes a network of nature reserves. As well as providing benefits to wildlife, these are enjoyed by residents who live nearby. According to the idea that the beneficiaries of conservation ought to pick up the tab, these residents should share in the costs of maintaining the reserves. In practice, however, when states fund such schemes, they do not require all citizens to pay, whether directly or through taxation. The elderly, children, and the unemployed are frequently excused from paying anything on the basis that they do not have the capacity to bear those costs. From the point of view of justice, this is quite right. An approach that focuses only on benefits wrongly neglects facts about capacity, which can also be highly relevant to the allocation of conservation costs.

Although I focused on the idea that the beneficiaries of conservation should pay, similar things could be said about the idea that it is those who contribute to damage to ecosystems who ought to pay for their conservation. In some cases, that judgement appears highly plausible. But in other cases, people damage ecosystems because they are desperately poor and lack reasonable alternatives. It should be a priority of global justice to alleviate the tension between conservation and pro-poor development, for instance by opening up opportunities for economic diversification that are less environmentally destructive (Armstrong 2017). But in the meantime, it makes no sense to require the very poor to pay for the damage they do because doing so would jeopardize their most basic interests. In this case, facts about ability to pay modify the conclusions one would otherwise reach on the basis of facts about contribution to ecosystem damage. What seems required, in sum, is some way of accommodating facts about contribution and benefits and capacity to make sacrifices. Any satisfactory answer to the question about how conservation costs should be allocated must rest on some combination of all 3 of these principles.

A pluralist framework for fair burden sharing

From the point of view of justice, the best way to accommodate these competing principles is to adopt a multistep procedure. First, identify cases in which conservation is necessary, for instance because valuable resources have become threatened or damaged. Second, consider whether anyone can be held morally responsible for the threat or damage. In some cases, no human being will be causally responsible for any damage (as when forests are damaged by volcanic activity). In other cases, someone will be responsible for the conservation challenge coming into existence. But the fact that they are causally responsible does not yet establish that they must be held remedially responsible (i.e., that they have a duty of justice to repair the damage). In this step, one must also consider whether they knew or could have been expected to anticipate the consequences of their activities. One must also assess whether they had any reasonable alternatives to acting in the way they did. If they did know the possible consequences and if they could reasonably have been expected to act otherwise, then the culprit, from the point of view of justice, stands in line to bear conservation costs. If, for instance, the reason a large predatory species is endangered is that it has been knowingly overhunted for reasons other than subsistence, then when it comes to allocating the costs of restoring the species, those who engaged in that pastime are responsible. Those who avoidably and knowingly emit disproportionate amounts of greenhouse gases, thereby contributing to the acidification of the oceans and the emergence of severe weather patterns, ought to bear the burdens of responding to coral bleaching and climate-related habitat loss.

There are, however, many cases where people cannot be held responsible for conservation threats – either because they have left the scene, did not know what they were doing, or had no reasonable alternative options open to them. In such cases, identifying causal contribution to the problem does not help assign costs. In such cases, one must engage in a third and final step. This initially involves turning to facts about benefits. When no culprit for conservation challenges can be found, one must ask who will benefit from acts of conservation. In principle, people ought to share in the costs of important public goods from which they benefit, and this includes the crucial ecosystem services they garner when resources and habitats are protected for posterity. And, again in principle, those who benefit more should pay more. This explains why it should be high-emitting countries – or, perhaps better, high-emitting individuals – who bear most of the costs involved in protecting the world’s forests or other carbon sinks. But, as I have argued, it makes no moral sense to require individuals or countries to share in conservation costs when they are desperately poor. Considerations of ability to pay are relevant here too and once more allow one to specify a crucial threshold below which people will not be asked to contribute even if they are major beneficiaries of conservation efforts.

In this framework, all three principles play a key role, often in a sequence. In many cases, those who contribute to damage should be the ones to pay for its repair. But this is not always the case, and one reason for forgiving people for the damage they do is that they are desperately poor and have no better options for escaping poverty than to engage in destructive development. In this sense, considerations of ability to pay establish a critical threshold below which facts about contribution to ecosystem damage become less relevant.

When culprits cannot be identified, one must then turn to facts about who will benefit from conservation. In principle, those who benefit from conservation should share in the costs involved in protecting or restoring precious resources, but not always. Once more, considerations of ability to pay allow one to set a critical threshold below which people should not be asked to contribute. Just as governments in the developed world do not ask the poor, sick, or unemployed to contribute to the cost of maintaining key public goods, so the international community should not require the poor of the world to share in the costs of conservation – even if those poor themselves are among the key beneficiaries of conservation projects.

The pluralist framework I have outlined is undoubtedly more complex than simple approaches that would lean on one simple principle. Although simplicity is often a virtue, when it comes to justice the search for one single principle capable of regulating the distribution of benefits and burdens can lead conservationists seriously astray. Focusing on benefits alone, for instance, wrongly ignores the fact that people are sometimes responsible for conservation challenges, and this must matter when it comes to allocating conservation burdens. It also ignores the fact that, in a highly unequal world, people have hugely varying capacities to absorb sacrifices. Some people, from the point of view of justice, should be exempted from carrying any conservation costs. The pluralist framework I argue for shows how contribution, capacity, and benefits can all matter to the allocation of conservation costs and illustrates how the 3 principles can be integrated into a multistep procedure for allocating conservation burdens.

Conclusions

The fair sharing of conservation burdens is one of the most pressing challenges our world faces. The present skewed allocation of costs is unfair on its face, not least because it often holds very poor people responsible for conserving resources that are of benefit to all and to future generations. It also makes effective conservation less likely, precisely because it leaves conservation burdens to those who are struggling against desperate poverty. Though many people share the intuition that the current allocation of burdens leaves a lot to be desired, a clear positive account of how these burdens should be shared is still needed. As I have shown, there is no simple answer to this question, and 3 moral principles are relevant. These concern who caused conservation challenges, who can best afford to bear the costs, and who stands to benefit from conservation projects. Because all three principles are relevant, simple accounts that give a role to 1 or 2 of these principles must be rejected. Instead, a pluralist framework is required that puts each principle in its proper place.

**Literature Cited**

Adams VA, Pressey RL, Naidoo R. 2009. Opportunity costs: who really pays for conservation? Biological Conservation 143: 439-448.

Armstrong C. 2016. Fairness, free riding and rainforest protection. Political Theory 44: 106-130.

Armstrong C. 2017. Justice and natural resources. Oxford University Press, Oxford.

Bamford A, Whitten T. 2003. Who should pay for tropical conservation, and how could the costs be met? Oryx 37: 238-250.

Baslar K. 1998. The concept of the common heritage of mankind in international law. Martinus Nijhoff Publishers, The Hague.

Bruner AG, Gullison RE, Bamford A. 2004. Financial costs and shortfalls of managing and expanding protected-area systems in developing countries. BioScience 54: 1119-1126.

Caney S. 2010. Climate change and the duties of the advantaged. Critical Review of International Social and Political Philosophy 13: 203-228.

Del Corral M. 2015. Respect, protection and restoration: preservation as a negative or a positive duty. Ethics, Policy & Environment 18: 268-70.

Dworkin R. 2000. Sovereign virtue. Harvard University Press, Cambridge Massachusetts.

Gardiner S. 2006. A core precautionary principle. Journal of Political Philosophy 14: 33-60.

Klosko G. 1987. Presumptive benefit, fairness, and political obligation. Philosophy & Public Affairs 16: 241-259.

Kymlicka W. 2002. Contemporary political philosophy, second edition. Oxford University Press, Oxford.

Mancilla A. 2016. Shared sovereignty over migratory natural resources. Res Publica 22: 21-35.

Miller D. 2007. National responsibility and global justice. Oxford University Press, Oxford.

Mitrani DS, Justus J, Huffaker B. 2018. The crucial but underrepresented role of philosophy in conservation science curricula. Conservation Biology (forthcoming).

Moellendorf D. 2014. The moral challenge of dangerous climate change. Oxford University Press, Oxford.

Nozick R. 1974. Anarchy, state and utopia. Blackwell, Oxford.

Rosales J. 2008. Economic growth, climate change, biodiversity loss: distributive justice for the global north and south. Conservation Biology 22: 1409-1417.

Sanderson SE and Redford KH. 2003. Contested relationships between biodiversity conservation and poverty alleviation. Oryx 37: 389-390.

Schrijver J. 1997. Permanent Sovereignty over Natural Resources: Balancing Rights and Duties. Oxford University Press, Oxford.

Shue H. 2014. Climate justice: vulnerability and protection. Oxford University Press, Oxford.

Strindberg S et al 2018. Guns, germs and trees determine density and distribution of gorillas and chimpanzees in Western Equatorial Africa. Science Advances 4: 2964.

Walsh PD et al 2003. Catastrophic ape decline in western equatorial Africa. Nature 422: 611-614.