

The moral basis for conservation: how is it affected by culture?

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We believe that conservation practice is sometimes inhibited by misguided respect for the cultural background in which conservation problems occur. This respect may be rooted in a philosophical standpoint asserting that culturally distinct values cannot be objectively judged against one another, and that those values are therefore equally valid. Here we consider the influence of this school of thought, known as “moral relativism”, in the context of the moral basis for biodiversity conservation as it is currently understood. We provide examples – in wildlife consumption, land management, and tolerance for releasing invasive species – where we suspect that such relativism has been influential. Although pragmatic constraints associated with human cultures may limit action for achieving conservation goals, we suggest that there are compelling arguments for the advocacy of universal principles, based on science, to protect biodiversity for current and future generations of people.

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In 2007, the novelist Martin Amis, having been accused of anti-Islamic sentiments, engaged in a debate at London’s Institute of Contemporary Arts to defend his views. At one point in the debate, Amis attempted to find common ground. “Would all those in the hall who think they are morally superior to the Taliban please raise your hands”, he requested. Fewer than one-third did so (*The Guardian* 2007).

What prompted the majority of this audience, which we may assume to have been dominated by educated, liberal Westerners, to keep their hands down? Perhaps they were nervous of expressing the view that one set of cultural values could be deemed inferior to another. Alternatively, they may have believed that it is not possible to make such a judgment, in which case they would be adhering to a “relativist” position. Moral relativism is the idea that moral judgments are all relative to their time and place and, as such, cannot be objectively justified and so cannot

be absolute (Lukes 2008). Can fear of being perceived as making a value judgment regarding a cultural belief inhibit conservationists from condemning some practices that threaten biodiversity? That is the question we address here. The influence of relativism is widespread in anthropology, and extends far beyond those confines (Lukes 2008). Jepson and Canney (2003) noted unease among predominantly Western conservationists that “promotion of *social values* [our emphasis] could be construed as a continuation of Western hegemony [dominance] with connotations of imperialism”. We contend that conservation biologists have a duty to promote *science*, even if that requires implicitly or explicitly criticizing a cultural practice. However, it is not necessarily the responsibility of those conservation scientists to decide what actions should be based on that science, given that doing so might blur the boundaries between evidence, its interpretation and application, and advocacy. So conservation scientists (as a subset of conservationists) may take the view that policy makers, as the agents responsible for considering the wider context, should act upon this evidence.

In a nutshell:

- Human activities with current or potential implications for conservation occur widely across different cultures
- Practices involving wildlife use – including those that are unsustainable – may be tolerated if they are perceived to be part of what defines a local “culture”
- The attitudes of conservationists may be inconsistent with respect to cultural and non-cultural wildlife use
- Cultures are subject to change and are not discrete entities; we argue that it is valid to promote such change in the interests of biodiversity conservation

■ Conservation ethics

By contending that the predominant interaction between conservationists and policy makers should be the interpretation of scientific findings, we are not arguing that science can tell us what is “right” or “wrong”. Scientific arguments (what the science of conservation tells us), moral arguments (what we *ought* to do), and political arguments (what the appropriate policy should be) are at least somewhat distinct; they hinge upon different issues and require different considerations. Nevertheless, science can inform moral decisions and therefore inform appropriate policy. Increasingly, conservationists are getting involved in policy formulation beyond merely offer-

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Figure 1. A market selling bushmeat in Bata, Equatorial Guinea.

ing peer-reviewed manuscripts to politicians – for example, they frequently engage with members of the media to disseminate their findings.

Conservation biologists try to maintain what is judged, by some evidence-based process, to be an “ecologically appropriate” level of biodiversity. But practical decisions must be made based on, among other concerns, the associated costs and benefits for different human interests (WebPanel 1; Sarkar and David 2012). The influence of relativism on this decision making is what concerns us. At what levels can we identify the influence of relativism?

At one extreme, there is a form of relativism – cognitive relativism – that challenges the objective basis of scientific knowledge. The influential anthropologist Bruno Latour is cited by Lukes (2008) as questioning the function of reasoning and factual evidence in the advancement of knowledge, though Lukes notes that Latour and others have distanced themselves from extreme relativist conclusions that others have based on their writings. Among these extremes is the proposition that facts are social constructs. This concept has been exposed and dismantled by Sokal and Bricmont (1998). Science may be contingent on – and potentially refuted or modified by – further study but is not “just one of many ways of knowing the world”, as the archaeologist Roger Anyon stated. We agree with Sir Edward Evans-Pritchard, the anthropologist also quoted by Lukes (2008). Evans-Pritchard dismissed the Zande tribe’s belief in witchcraft for explaining numerous natural phenomena, for instance the failure of the ground-nut crop. Cognitive relativism may not present an everyday dilemma for conservationists but rather poses an empty threat to the philosophical foundations of conservation.

Culture and ideology certainly influence scientific choices, as Sokal and Bricmont (1998) acknowledged. For instance, decisions about research priorities are inevitably based on value judgments; Neff (2011) explored aspects of this among ecologists. Value judg-

ments therefore contribute to the diversity of conservation methodologies. A recent review of social science in conservation (Moon and Blackman 2014) describes this diversity, and argues that the “relativist” perspective can usefully complement “realism”. A review of this complementarity in action (Biggs *et al.* 2011) partially supports this. Our interpretation of these case histories suggests no philosophical conflict, but rather that the relativism described focuses on the diversity of stakeholders and the complexity of the decision-making process, with less emphasis on constructing predictive models. For example, the study by Pierce *et al.* (2005) explored the management of South Africa’s sub-tropical thicket biome and the different perspectives of conservationists, planners, and farmers. By analyzing how

these groups valued different aspects of the ecosystem, the authors were able to identify the most sustainable policies for future management, and provide educational material where ecosystem attributes were perceived to be undervalued.

The use of some methodologies described as “relativist” for their emphasis on diverse perspectives of complex systems can be constructive. But where viewpoints are given equal value regardless of their scientific merit, relativity may impinge on conservation. Below, we present examples illustrating the possible effect of relativism on different aspects of conservation. While clearly unsustainable practices should attract urgent attention, as they promise a lose–lose outcome both for their practitioners and for conservation, not all of our examples involve practices that are obviously unsustainable (although sustainability is not always easily demonstrated – the reliability of commonly accepted indicators of sustainability has been questioned; Weinbaum *et al.* 2013). However, all of our case histories touch on issues that are relevant for global and local conservation.

We acknowledge that disentangling the cultural aspects of a practice may not be straightforward, particularly if that practice has more than one purpose. Bushmeat consumption in West Africa illustrates our understanding of cultural use; this amounts to asking “what need is satisfied by the practice?” Currently, in some parts of the tropics, bushmeat consumption represents a conservation crisis (Figure 1). Evidence suggests a dichotomy in motivation for its use. In rural areas, few protein sources are available, and people primarily consume bushmeat for nutritional purposes (Fa *et al.* 2007). Yet in urban areas – where bushmeat is expensive and usually comprises a small part of the diet – consumers may eat it out of a desire for “connection” with their rural roots. This practice accounts for bushmeat seizures in major European airports (Chaber *et al.* 2010). We contend that conservationists may be more comfortable addressing the former motives where (practi-

cal difficulties notwithstanding) potential solutions are based on science and economics. The need for an adequate diet does not meaningfully define any “culture”. In the latter case, however, finding a potential solution requires confronting a culturally based behavior. At that point the problem arises.

Many of the practices we discuss, including bushmeat consumption, emerged before recent rapid human population growth, and before the development of modern technology. Population growth and technology affected conservation synergistically, and their combined impact, along with that of commercialization, continues to exacerbate conflicts between conservation and culture. In Africa, the impacts of bushmeat exploitation have been magnified by the recent increased availability of cable snares (a type of wildlife trap; Fa *et al.* 2007). The transformation of whaling from a subsistence enterprise to a global business in the early 20th century – with catastrophic effects on cetacean populations – is another well-known example (Clapham and Baker 2002).

■ Cultural aspects of killing wildlife

People seem more willing to challenge certain cultural wildlife practices, especially those in the developed world. In the UK, where a long-standing debate on the ethics of hunting red foxes (*Vulpes vulpes*) culminated in a ban in 2005, the cultural importance of the sport was often cited in its defense, in addition to the economic arguments based on livestock losses (Macdonald and Johnson 2015). Similarly, in the US, rural ranchers often have a strong cultural affinity for hunting, and view killing wildlife (including threatened wolves, *Canis lupus*) as a fundamental right. Both wolf and fox hunting provoke intense opposition from conservationists and from those concerned by the welfare implications of hunting. We believe these debates have been unencumbered by relativism because opponents of these forms of hunting are not fearful of accusations of “cultural imperialism”.

Cultural wildlife use outside the Western world incites less open debate. The use of wild cat skins in clothing provides a conspicuous example of relativism. During the 1970s, fur coats were a status symbol in the West: in 1977, a minimum of 600 000 felid pelts were sold (Nowell and Jackson 1996). Conservation and animal welfare groups lobbied vocally against the trade, with considerable success. Today, in Europe and the US at least, fur cannot be openly worn without fear of vilification. Wearing fur may be viewed differently, however, if it is perceived as being for “cultural” reasons. For instance, elders of the Nazareth Baptist (“Shembe”) Church in South Africa wear cat



Figure 2. Shembe elders at a ceremony, wearing leopard-skin capes and other furs.

skins (mainly leopard, *Panthera pardus*) for religious ceremonies (Figure 2). This practice is widespread and has increased recently, posing a considerable threat to local leopard populations. Roughly 1000 ceremonial capes, representing 500 or more leopards, were counted at a single Shembe gathering during 2011 (Hunter *et al.* 2013). Despite constituting “the biggest display of illegal wildlife contraband on Earth” (G Balme, cited in France-Pressé 2014), such ceremonial use rarely provokes a reaction from wildlife officials; the tradition has also attracted relatively little attention among the international public, although the conservation group Panthera is now lobbying for the substitution of synthetic equivalents and has achieved some success (France-Pressé 2014).

There are many other cases where species are hunted for cultural and social reasons, often with marked conservation impacts. In Tanzania, pastoralists kill both lions (*Panthera leo*) and African elephants (*Loxodonta africana*) to gain cultural prestige and obtain amulets: lion claws are removed and worn to demonstrate bravery and the killer receives rewards, in the form of cattle, from other villagers; lion ribs are used to provide protection against evil; and small twigs found lodged in elephants’ temporal glands (known as “wisdom sticks”) are sought out for their high local value as protective amulets (A Dickman, pers obs). In some village areas around Tanzania’s Ruaha National Park at least six lions per 100 km² were killed for this purpose in 2011 – enough to have a notable impact on the local lion population. While such practices are long-standing, the advent of mass-produced poisons and increasing conflict with a growing human population has increased lion killing in this area (A Dickman, pers obs).

In Kenya, young men kill lions to earn social accolades, and there is also a strong link between adherence to a local evangelical religion and the propensity to kill lions (Hazzah *et al.* 2009). Conservationists have yet to openly



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Figure 3. An Ethiopian wolf (*Canis simensis*) and domestic cattle in Bale National Park, Ethiopia.

challenge the church concerned (the Kenyan Assemblies of God) about this practice. In the Peruvian Amazon, the Yawar Fiestas are important cultural rituals, and involve tying wild-caught Andean condors (*Vultur gryphus*) to domestic bulls before “releasing” them by force-feeding them alcohol and flinging them off cliffs (Tegel 2011). Catching condors is illegal in Peru, but the country’s constitution protects the “cultural identity of indigenous and peasant communities”, allowing the tradition to continue even though it is likely to kill or injure the condors (Tegel 2011). With a Peruvian population of fewer than 500 condors, and over 30 groups performing the festival annually, using up to four condors at a time, local conservation groups have recognized the practice as an imminent threat to the population (Tegel 2011). Despite this, conservationists are “wary of provoking cultural sensitivities...and want to use the Yawar Fiesta to spearhead a public education campaign rather than simply attempt to ban it” (Tegel 2011).

In parts of rural Africa, lion persecution is heightened by belief in witchcraft, as lions are thought to embody the spirits of human enemies (West 2001). Endangered chimpanzees (*Pan troglodytes*) are killed in Sierra Leone out of fear that they are shape-shifted humans (Richards 2000). Similarly, endangered lemurs known as aye-ayes (*Daubentonia madagascariensis*) are often killed on sight because of their purported associations with evil spirits (Glaw *et al.* 2008). Spotted hyenas (*Crocuta crocuta*) have long been vilified and persecuted due to beliefs that they are evil, sexually deviant creatures who carry invisible, naked witches on their backs (Dunham 2006). While some of these traditional beliefs and practices may be ancient, others are not; the Shembe religion is only about 100 years old. Among the more recent examples is the growing trend in South Africa of smoking dried vulture brains; the smoke is said to induce various effects, including visions of winning lottery numbers (*UK Daily*

Telegraph, 28 Dec 2009). This practice is increasingly imperiling the Cape vulture (*Gyps coprotheres*).

Other examples are more subtle. The legality of whale exploitation, an issue that inspires strong emotions, is currently more relaxed if the motivation is cultural. In 1986, the International Whaling Commission (IWC) introduced “zero catch limits” for commercial whaling, allowing only “aboriginal subsistence” whaling (<http://iwc.int/aboriginal>). The IWC justified the exemptions as enabling “native people to hunt whales at levels appropriate to their cultural and nutritional requirements”, although modern technology may be used (Reeves 2002). Conservationists allowed cultural factors to mitigate what might otherwise have been a recommendation for unlimited protection; Reeves (2002) reported that most non-governmental organizations interested in whale conservation

expressed, at that time, support for the rights of aboriginal people with a history of whaling to continue to hunt whales. In the Faroe Islands, the long-standing annual hunt of long-finned pilot whales (*Globicephala melas*) is said to be “an established symbol of Faroese identity” (Sanderson 1992, cited by Fielding 2010). There are some cases where Western conservationists seem more at ease with challenging damaging cultural wildlife use. The use of tiger (*Panthera tigris*) bones in traditional Chinese medicine, and the demand for ivory in Asian markets, are both long-standing cultural practices that have received widespread condemnation. Continued demand for tiger products across Asia has been blamed for local extinctions and declines (Dinerstein *et al.* 2007). The medicinal efficacy of traditional Chinese medicines is questionable, with opinions differing strongly between Asia and the West (Qiu 2007) – but currently, the use of these remedies is largely based on cultural affinity rather than scientific evidence. While strident in this case, conservationists often seem hesitant to act against “culture–conservation conflicts” in less-developed countries.

■ Repercussions of non-consumptive cultural practices

Conservation action to offset habitat loss and degradation may also be inhibited by cultural concerns. The Bale National Park in Ethiopia is one of the last remaining strongholds of the critically endangered Ethiopian wolf (*Canis simensis*), but the population in this park is threatened by increasing numbers of cattle (Figure 3). Both grazing-induced habitat degradation and diseases from domestic dogs kept alongside the herds threaten the long-term sustainability of the wolf population (Vial *et al.* 2011). The effects of overgrazing are clearly visible, especially around water holes (F van Kesteren, pers obs).

An analysis of the history of cattle husbandry in and

around the park (Flintan *et al.* 2008) suggests that the practice is probably not traditional, having been dramatically altered by relatively recent political upheavals. Furthermore, productivity appears to be negligible; many herds produce no meat, and constitute a “bank” to be cashed only in an emergency. Burrard-Lucas *et al.* (2013) commented that the “animals in a herd are more a symbol of wealth than a source of food or even of income” and “animals establish their [herder’s] social rank”. Flintan *et al.* (2008) observed that the cattle are “more than economically” useful – they appear to have important cultural worth, as seen with other pastoralist groups such as the Maasai (Spear and Waller 1993). From a conservation standpoint, these cattle-herding practices should be legitimate topics for lobbyists wishing to alter them, although we are not advocating a comprehensive “no people” policy for all parks (WebPanel 2).

Traditional practices can also exacerbate problems with invasive species, which are currently one of the greatest threats to global biodiversity conservation (Macdonald *et al.* 2007). Agoramorthy and Hsu (2005) highlighted the scale of Buddhist and Taoist ceremonial releases of exotic species in Taiwan; the releases – including mammals, birds, fish, reptiles, amphibians, and insects – are connected with a desire to do “good deeds” during one’s life. Liu *et al.* (2012) reported that the practice also occurs in China, Canada, Australia, Vietnam, and the US. They showed that this has resulted in the establishment of populations of American bullfrog (*Rana catesbeiana*) in numerous water bodies across the Yunnan province of China. This species is included in the International Union for Conservation of Nature’s [IUCN’s] “100 of the World’s Worst Invasive Alien Species”. However, their management recommendations fall short of calling for legislation against the practice. Instead, the IUCN advocates education, native species breeding programs, and the use of “designated water bodies” for any such releases. If these releases were motivated by reasons other than culture, we speculate that IUCN officials might have adopted stronger recommendations.

■ Where culture protects wildlife

Should conservationists promote myths when they have positive impacts for conservation? For example, snow leopards (*Panthera uncia*) sometimes kill domestic stock in rural Nepal. In most other places, this behavior would lead to retaliatory killing, but Nepalese snow leopards are often tolerated by local Buddhists who believe that they are associated with the “mountain god”, and that killing one is sinful (Ale 1998). Elsewhere, some communities believe in sacred areas, such as “sacred groves” considered to be the “abode of the gods”, which are left relatively untouched (Bhagwat and Rutte 2006). These areas usually have ecological value, for instance by acting as watersheds. Conservation agencies have been quick to embrace these apparently useful traditions; WWF pro-

duced a report on the potential value of sacred sites to conservation, which “brings the all too often neglected issues of spirit and culture to the foreground of conservation approaches” (Dudley *et al.* 2005). Similarly, some conservationists have suggested forming partnerships with religious leaders – many of whom hold positions of power within communities – to help spread conservation-oriented messages (Bhagwat *et al.* 2011). The reasoning is that although conservationists and faith groups may be “driven by different moral agendas, there is considerable overlap in practice” (Adams *et al.* 2004; Bhagwat *et al.* 2011). Nevertheless, we believe that ethical issues may arise in cases where conservation scientists knowingly endorse perceptions unsupported by science in the belief that “the ends justify the means”.

The same applies where taboos inhibit wildlife consumption; this occurs in West Africa, where Obioha *et al.* (2012) suggested that by “constructively repositioning” taboos, conservationists could exploit them. We see the appeal of this proposal, particularly in a conservation crisis, but there is a cost for such “moral opportunism”. Exploiting taboos in this way – in effect promoting anti-science perspectives – risks compromising the integrity of the scientific method, and therefore discrediting conservationists in general. We suspect such an idea would not pass ethical review in many academic institutions.

Manipulating cultural practices in the interests of conservation without resorting to the promotion of anti-science attitudes may be possible. Until recently, taboos protected lemurs from exploitation for bushmeat (Jenkins *et al.* 2011). But lemurs now appear as menu selections in some of Madagascar’s restaurants, prompting Hambler and Canney (2013) to comment that the “cultural landscape” providing protection can be “accidental and arbitrary, and vulnerable to rapid decline”. Perversely, this offers some grounds for optimism regarding practices with a negative effect on biodiversity. A notable example of cultural transformation is provided by the Trobriand Islanders of the Pacific. In the 1930s, missionaries introduced the popular sport known as cricket in an effort to replace traditional warfare; the islanders adapted the game, incorporating many of their preexisting cultural themes but with much less violence (Stoddart 1988).

■ Conclusions

Some management strategies widely practiced in the UK, such as coppicing trees (a traditional method of woodland management where trees are cut to near ground level and allowed to regrow), have been criticized for their poor evidence base and for being “more rooted in culture and tradition than in science” (Hambler and Speight 1995). What sympathy should we grant for tradition, whether for cutting down trees in a UK woodland, or for the killing of threatened species for cultural reasons? A lion may represent one man’s trophy, another’s photo opportunity, another’s threat or nuisance, and the

ghost of another's enemy (Macdonald 2013). While the foundations for each of these views are open to scrutiny and their consequences open to quantification and cost–benefit analysis, the last view in this list represents a traditional yet baseless belief (similar to “demonic” aye-ayes and “witch-bearing” hyenas). We are mindful that metaphysical propositions underpin the world's dominant religions (Dawkins 2009), and we are not implying that beliefs such as those relating to hyenas are any more or less implausible. Our central argument is that any action that has a negative conservation impact does not acquire more validity by being rooted in tradition or culture, as compared with any other motivation.

We recognize there may be considerable barriers to change, and not all transformations can be as successful as substituting cricket for violence in the Trobriand Islands. As Bhagwat (2009) stated, conservationists have to contend with the fact that in many “traditional” societies, conservation is perceived as being imposed by the Western world, and there are numerous cases where heavy-handed approaches have failed. The objective of conservationists is not the imposition of Western values, but the development of a policy that is consistent with the relevant conservation goals. A successful example of this approach is the “Lion Guardians” model in Amboseli, Kenya, where Maasai warriors were killing large numbers of lions (Hazzah *et al.* 2014). In-depth research revealed strong cultural drivers of lion killing, as the tradition provided an opportunity for young men to gain social status. However, young men could also gain status through wealth and skills such as literacy. Therefore, warriors became employed as “Lion Guardians” to track lions and help protect the community from attacks, for instance by finding lost livestock and predator-proofing enclosures. The Guardians receive training and income while maintaining their traditional “warrior” role of community protectors. This has successfully reduced lion killing by acknowledging and embracing cultural factors, rather than by imposing an external ideology (Hazzah *et al.* 2014).

If relativism does have an undesirable impact on conservation, that impact alone provides a pragmatic basis to oppose it. But what is the philosophical basis for countering relativism's disquieting implications? Lukes (2008) drew attention to the “capabilities” approach, developed by Martha Nussbaum and Amartya Sen in the field of development economics, which is discussed at length by Crocker (1992). This is founded on the notion that there are components of well-being (good health, and the ability to take part in decisions affecting one's future, for example) that are judged to be desirable when they occur in any human life, and that on this there is a consensus among people from different cultures (John Rawls, cited by Lukes 2008). Discussing the extent of this consensus, Lukes points out that art across different cultures depicts tragedy, for example, with similar themes. He goes on to quote from Isaiah Berlin's final essay, where Berlin argued that all

human beings had common shared values that were part of the definition of their humanity. In the context of biodiversity conservation, Hamblin and Canney (2013) called attention to a parallel tendency, where people from different cultures report similarly positive attitudes to the principle of conservation. The capabilities idea resonates with the efforts of Harris (2011) to construct an objective basis for morality. The needs and wants of future generations of humans can be met only if conservation succeeds in the long term. In the short term, there are difficult decisions to be made, particularly where “business as usual” is unsustainable. Ultimately, it may require sustained moral courage to face the challenge of using scientific knowledge to achieve cultural change regarding wildlife use.

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■ References

- Adams WM, Aveling R, Brockington D, *et al.* 2004. Biodiversity conservation and the eradication of poverty. *Science* **306**: 1146–49.
- Agoramoorthy G and Hsu MJ. 2005. Religious freeing of wildlife promotes alien species invasion. *BioScience* **55**: 6.
- Ale S. 1998. Culture and conservation: the snow leopard in Nepal. *International Snow Leopard Trust Newsletter* **16**: 10.
- Bhagwat SA. 2009. Ecosystem services and sacred natural sites: reconciling material and non-material values in nature conservation. *Environ Value* **18**: 417–27.
- Bhagwat SA and Rutte C. 2006. Sacred groves: potential for biodiversity management. *Front Ecol Environ* **4**: 519–24.
- Bhagwat SA, Dudley N, and Harrop SR. 2011. Religious following in biodiversity hotspots: challenges and opportunities for conservation and development. *Conserv Lett* **4**: 234–40.
- Biggs D, Abel N, Knight AT, *et al.* 2011. The implementation crisis in conservation planning: could “mental models” help? *Conserv Lett* **4**: 169–83.
- Burrard-Lucas W, Jackrel RR, and Heimbuch J. 2013. The Ethiopian wolf: hope at the end of extinction. San Francisco, CA: Lobelia Press.
- Chaber AL, Allebone-Webb S, Lignereux Y, *et al.* 2010. The scale of illegal meat importation from Africa to Europe via Paris. *Conserv Lett* **3**: 317–21.
- Clapham PJ and Baker CS. 2002. Modern whaling. In: Perrin WF, Würsig B, and Thewissen JGM (Eds). *Encyclopedia of marine mammals*. New York, NY: Academic Press.
- Crocker DA. 1992. Functioning and capability: the foundations of Sen's and Nussbaum's development ethic. *Polit Theory* **20**: 584–612.
- Dawkins R. 2009. *The God delusion*. London, UK: Random House.
- Dinerstein E, Loucks C, Wikramanayake E, *et al.* 2007. The fate of wild tigers. *BioScience* **57**: 508–14.
- Dudley N, Higgins-Zogib L, and Mansourian S. 2005. *Beyond belief: linking faiths and protected areas to support biodiversity conservation*. Gland, Switzerland: World Wide Fund for Nature (WWF) and the Alliance of Religions and Conservation (ARC).

- Dunham M. 2006. The hyena: witch's auxiliary or nature's fool? Witchcraft and animal lore amongst the Valengi of Tanzania. <https://halshs.archives-ouvertes.fr/halshs-00009734/document>. Viewed 6 Mar 2015.
- Fa JE, Albrechtsen L, and Brown D. 2007. Bushmeat: the challenge of balancing human and wildlife needs in African moist tropical forests. In: Macdonald DW and Service K (Eds). Key topics in conservation biology. Oxford, UK: Blackwell Publishing.
- Fielding R. 2010. Environmental change as a threat to the pilot whale hunt in the Faroe Islands. *Polar Res* 29: 430–38.
- Flintan F, Worku C, Wako D, *et al.* 2008. Livestock and livestock systems in the Bale Mountains ecoregion. Addis Ababa, Ethiopia: Bale Mountains Ecoregion Sustainable Management Project.
- France-Presse A. 2014. Zulu false dawn: Shembe faithful swap leopardskin for faux fur. www.theguardian.com/world/2014/feb/19/zulu-shembe-leopardskin-south-africa. Viewed 6 Mar 2015.
- Glaw F, Vences M, and Randrianiaina RD. 2008. Killed aye-aye (*Daubentonia madagascariensis*) exposed on the gallows in northeastern Madagascar. *Lemur News* 13: 6.
- Hambler C and Canney SM. 2013. Conservation. Cambridge, UK: Cambridge University Press.
- Hambler C and Speight MR. 1995. Biodiversity conservation in Britain. *Brit Wildlife* 6: 137–47.
- Harris S. 2011. The moral landscape: how science can determine human values. New York, NY: Simon and Schuster.
- Hazzah L, Borgerhoff Mulder M, and Frank L. 2009. Lions and warriors: social factors underlying declining African lion populations and the effect of incentive-based management in Kenya. *Biol Conserv* 142: 2428–37.
- Hazzah L, Dolrenry S, Naughton L, *et al.* 2014. Efficacy of two lion conservation programs in Maasailand, Kenya. *Conserv Biol* 28: 851–60.
- Hunter L, Henschel P, and Ray J. 2013. *Panthera pardus* leopard. In: Kingdon J and Hoffman M (Eds). The mammals of Africa (Volume V): carnivores, pangolins, equids and rhinoceroses. London, UK: Bloomsbury Publishing.
- Jenkins RK, Keane A, Rakotoarivelo AR, *et al.* 2011. Analysis of patterns of bushmeat consumption reveals extensive exploitation of protected species in eastern Madagascar. *PLoS ONE* 6: e27570.
- Jepson P and Canney S. 2003. Values-led conservation. *Global Ecol Biogeogr* 12: 271–74.
- Liu X, McGarrity ME, and Li Y. 2012. The influence of traditional Buddhist wildlife release on biological invasions. *Conserv Lett* 5: 107–14.
- Lukes S. 2008. Moral relativism. London, UK: Profile Books.
- Macdonald DW. 2013. From ethology to biodiversity: case studies of wildlife conservation. *Nova Acta Lc* 111: 111–56.
- Macdonald DW and Johnson PJ. 2015. Foxes in the landscape: hunting, control, and economics. In: Macdonald DW and Feber RE (Eds). Wildlife conservation on farmland. Vol 2. Conflict in the countryside. Oxford, UK: Oxford University Press.
- Macdonald DW, King CM, and Strachan R. 2007. Introduced species and the line between biodiversity conservation and naturalistic eugenics. In: Macdonald DW and Service K (Eds). Key topics in conservation biology. Malden, MA: Blackwell.
- Moon K and Blackman D. 2014. A guide to understanding social science research for natural scientists. *Conserv Biol* 28: 1167–77.
- Neff MW. 2011. What research should be done and why? Four competing visions among ecologists. *Front Ecol Environ* 9: 462–69.
- Nowell K and Jackson P. 1996. Wild cats: status survey and conservation action plan. Cambridge, UK: Burlington Press.
- Obioha E, Isiugo P, Jimoh S, *et al.* 2012. Bush meat harvesting and human subsistence nexus in the Oban Hill communities of Nigeria. *J Human Ecol* 38: 49–64.
- Qiu J. 2007. Traditional medicine – a culture in the balance. *Nature* 448: 126–28.
- Pierce SM, Cowling RM, Knight AT, *et al.* 2005. Systematic conservation planning products for land-use planning: interpretation for implementation. *Biol Conserv* 125: 441–58.
- Reeves RR. 2002. The origins and character of “aboriginal subsistence” whaling: a global review. *Mammal Rev* 32: 71–106.
- Richards P. 2000. Chimpanzees as political animals in Sierra Leone. In: Knight J (Ed). Natural enemies: people–wildlife conflict in anthropological perspective. London, UK: Routledge.
- Sarkar S and David FM. 2012. Conservation biology: ethical foundations. *Nature Education Knowledge* 3: 1–6.
- Sokal AD and Bricmont J. 1998. Intellectual impostures: postmodern philosophers' abuse of science. London, UK: Profile Books London.
- Spear T and Waller R (Eds). 1993. Introduction. In: Being Maasai: ethnicity and identity in East Africa. London, UK: James Currey.
- Stoddart B. 1988. Sport, cultural imperialism, and colonial response in the British Empire. *Comp Stud Soc Hist* 30: 649–73.
- Tegel S. 2011. Why the day of the condor could be drawing to a close. *The Independent*. www.independent.co.uk/environment/nature/why-the-day-of-the-condor-could-be-drawing-to-a-close-2331401.html. Viewed 6 Mar 2015.
- The Guardian*. 2007. Amis prolongs the debate. www.theguardian.com/books/2007/dec/08/martinamis. Viewed 6 Mar 2015.
- The Telegraph*. 2009. South Africans smoke vulture brains to bring lottery luck. www.telegraph.co.uk/news/worldnews/africaandindianocean/southafrica/6895577/South-Africans-smoke-vulture-brains-to-bring-lottery-luck.html. Viewed 1 Jun 2015.
- Vial F, Sillero-Zubiri C, Marino J, *et al.* 2011. An analysis of long-term trends in the abundance of domestic livestock and free-roaming dogs in the Bale Mountains National Park, Ethiopia. *Afr J Ecol* 49: 91–102.
- Weinbaum KZ, Brashares JS, Golden CD, *et al.* 2013. Searching for sustainability: are assessments of wildlife harvests behind the times? *Ecol Lett* 16: 99–111.
- West H. 2001. Sorcery of construction and socialist modernization: ways of understanding power in postcolonial Mozambique. *Am Ethnol* 28: 119–50.