



Mixed signals from hunting rare wildlife

Peer-reviewed letter

Public and practitioner opinions differ greatly as to when, where, how, and whether it may be economically, ecologically, and ethically appropriate to hunt rare and endangered wildlife for sport, particularly species subject to poaching (Treves 2009; Wielgus *et al.* 2013). Examples include rhinoceros (Figure 1; Prins and Okita-Ouma 2013), elephant (Cressey 2013), bear (Swenson *et al.* 1997), and cougar (Cooley *et al.* 2009). Some species have been hunted to extinction, whereas others have been protected in hunting estates or by hunting leases. Certain landowners intentionally kill endangered predators to increase the abundance of non-endangered target species (Thompson *et al.* 2009). Hunting can change population structure (Swenson *et al.* 1997; Milner *et al.* 2007; Packer *et al.* 2011), as well as species distribution (Davidson *et al.* 2011) and morphology (Jachmann *et al.* 1995). In areas where wildlife watching and game hunting tours operate adjacently or sequentially, habituation to the presence of humans benefits hunters at the expense of viewers.

Here, I suggest that hunting rare and endangered wildlife also sends four inadvertent but powerful sociopolitical signals, with conservation consequences. These signals occur irrespective of the direct consequences of hunting, either through individual mortality or by funding conservation efforts through hunting fees. The first signal is to Asian nations that import threatened animals for use in traditional medicine. East Asians are less likely to halt consumption of rare animals for self-perceived human well-being if citizens of Western countries continue to hunt rare animals for self-perceived human well-being. Legal hunting also complicates monitoring and controlling international illegal trade in animal parts. The second signal is to conservation donors (Clements



Figure 1. Black rhinoceros (*Dicerus bicornis*) at an undisclosed field location in Africa.

2013), who may reduce charitable monetary donations if they believe that their money is subsidizing hunters. The third signal is to unscrupulous government personnel who could profit from the issuance of hunting permits; such personnel may use one hunting event as a precedent for allowing other events, without regard to maintaining species' local population carrying capacities. The fourth signal operates via clients of the commercial conservation tourism industry, who may reduce support in response to hunting. Numerous multi-million-dollar translocation projects – for example, for rhino, tiger, and gaur – have been funded by conservation tourism operators (Buckley and Pabla 2012; Carlisle 2013; Collins *et al.* 2013; Great Plains Foundation 2014). From its five tourist lodges in Kenya, the Lewa Wildlife Conservancy raises US\$1 000 000 annually: equivalent to one-third of its anti-poaching budget, which protects >120 rhinoceros, both white and black (Lewa Wildlife Conservancy 2014). These companies incur additional marketing costs to differentiate themselves from sport hunts, or to justify them (Moffett 2013).

The pros and cons of commercial sport hunting tourism of species at risk are debated principally in terms

of local economic or ecological mechanisms, which remain important. Local-scale ecological effects of trophy hunting, besides direct loss of individuals, may include changes to population structure and genetics through mechanisms such as reduced fertility, increased territorial conflict, and infanticide (Whitman *et al.* 2004; Wielgus *et al.* 2013). Local-scale economic mechanisms include the provision of community benefits that may sometimes, though not always, generate local social support to maintain populations of trophy species (Buckley 2011, 2014; Freeman and Wenzel 2006; Lindsey *et al.* 2007a,b). I argue that there are also indirect international mechanisms operating via inadvertent communications to more distant individuals who may also influence outcomes, and that these may outweigh local effects.

Some respected conservationists advocate sport hunting as a tool to be used for the protection of threatened wildlife species; others are strongly opposed. The argument depends on the relative conservation costs and benefits, which are based on local-scale mechanisms to harness financial revenues so as to fund direct conservation actions and boost local community support. These calculations, however, are incomplete, unless they also consider the conservation conse-

quences of the unintentional but powerful global-scale political signals outlined above. These signals are surely strong enough to change the entire equation.

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Embrace new conservation

The first semester I taught an ecology course, I put the following question on an exam: “What species fixes the most nitrogen?” The answer I expected was “humans”. Only one student out of 40 gave this answer. One person wrote “humans”, scratched it out, and wrote “lightning”. I’ve kept that question, changed my biogeochemical cycle lectures to include images of people, and now 95% of the students answer “humans”. That experience, however, made me wiser. In general, people don’t see themselves as part of ecosystems. As a corollary, when people think of conserving nature, they don’t think of helping people. They think of a park or natural area that they visit. They don’t think of nature as everywhere.

I’m surprised that this may even be true for some fellow ecologists and conservationists.

Recently, some conservationists have suggested that people and their needs should be more explicitly integrated into conservation science (eg Kareiva and Marvier 2012). This approach has been labeled the “New Conservation” (Soulé 2013; Marvier 2014). Reactions to this suggestion have been strong and primarily negative, with the approach being called a “radical departure from conservation” (Soulé 2013), which “restricts the focus of conservation to the advancement of human well-being” (Doak et al. 2014). When I read what Michelle Marvier, Peter Kareiva, and others have written, however, I hear something very different (Kareiva and Marvier 2012; Marvier 2014). I hear a call for conservation to occur through the use of novel, creative strategies. I hear a call to implement this approach across the entire landscape, where priorities will – by necessity – shift across ownership boundaries, what the authors call creating “working landscapes” (Kareiva and Marvier 2012). Biodiversity cannot be the highest priority everywhere, but what if it could be considered everywhere? The New Conservation sounds to me a lot like “Reconciliation Ecology” (Rosenzweig 2003). Of course there will be many locations where human well-being is the primary goal – for example, a city – but conservation objectives can be embedded into the goals of these areas to enhance services such as flood resistance and pest control. We can train conservationists to work with city planners and landscape architects to create biodiverse, natural infrastructure instead of using more concrete. Part of what I also hear is a call for more ecologists and conservationists to work outside of parks and natural areas, to start thinking about how we can implement conservation everywhere and how our associated research programs must change so that we learn how to do this well.