



Conservation professionals agree on challenges to coexisting with large carnivores but not on solutions



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ABSTRACT

Although many studies explore characteristics of stakeholders or publics “for” or “against” large carnivores, disagreements among conservation professionals advocating different conservation strategies also occur, but are not well recognized. Differing viewpoints on whether and how humans can share landscapes with large carnivores can influence conservation policies. To characterize current viewpoints about terrestrial large carnivore conservation, we conducted an online survey assessing a wide range of viewpoints about large carnivore conservation among international professionals ($n = 505$). We explored how variation in viewpoints was related to expertise, background, and broader institutional contexts in which one lives and works. The majority of participants agreed people and large carnivores can share the same landscapes (86%). Human adaptation to carnivores (95% agreement) and acceptance of some conflict (93%) were the highest ranked requirements for human-carnivore coexistence. We found broad consensus regarding intrinsic value of carnivores, reasons carnivores are imperilled, conflict drivers, and importance of proactive solutions, such as adopting preventative livestock husbandry methods or avoiding situations that put people at risk. The greatest polarization was observed in issues related to lethal control, where we only found broad consensus for killing carnivores in situations where humans are in immediate risk. Participants opposed the killing of large carnivores when objectives were to decrease population sizes or increase human tolerance, profits, livelihoods, or fear of humans. Results point to considerable diversity, perhaps driven by local context, concerning how to proceed with large carnivore conservation in the increasingly human-influenced landscapes of the Anthropocene. The different observed viewpoints represent both different strategies about how to best conserve, but also different moral platforms about what, how, where, and for whom conservation should occur. Our study underlines that challenges to adopting and implementing long-lasting carnivore conservation strategies may well occur as much within the conservation community as outside it.

1. Introduction

Large carnivores (hereafter carnivores) are among the most controversial species in conservation. Their predatory behavior, including killing domestic animals or game species, comes into conflict with human interests (Quigley and Herrero, 2005) and may represent the main factor hindering human-carnivore coexistence. Social conflicts between human stakeholder groups with different values, emotions and interests also complicate carnivore conservation (Dietsch et al., 2016; Lute et al., 2016; Redpath et al., 2015). Economic, social and political issues (Chapron and Lopez-Bao, 2014; Newsome et al., 2016), and the multifaceted symbolic nature of large carnivores add further challenges

to carnivore conservation (López-Bao et al., 2017; Skogen et al., 2017).

Although much research has focused on public stakeholder positions “for” or “against” carnivores (e.g., Dressel et al., 2015; Slagle et al., 2017), many heated conflicts between conservation professionals (e.g., wildlife biologists, employees of non-governmental organizations [NGOs], social and biological researchers) advocating and justifying different conservation strategies also exist. At the heart of this controversy are questions of whether humans and carnivores can and should share space, and how to manage this relationship (Carter and Linnell, 2016; Chapron et al., 2014; López-Bao et al., 2017; Packer et al., 2013). Answering these questions involves insights from behavioral, psychological and ecological sciences, as well as philosophy.

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Synthesizing distinct disciplines is the difficult task of conservation professionals who inform and take part in the decision-making processes and public discourses about large carnivores.

In response to multiple conservation challenges, two fundamental perspectives have been proposed: land sparing for carnivores or land sharing between humans and carnivores (López-Bao et al., 2017). The tension between these two perspectives is evidenced by the lively debates, for example, regarding fencing to protect humans and African lions (*Panthera leo*), coexisting tigers (*P. tigris*) and people in Nepal or recovering grey wolves (*Canis lupus*) in developed nations (Carter et al., 2012, 2013; Chapron et al., 2014; Lopez-Bao et al., 2015; Packer et al., 2013). Fundamentally, current debate is over the often-stated goal of coexistence and its location along a spectrum of land sparing to sharing (Carter and Linnell, 2016).

Controversy over carnivores within and outside professional conservation communities also often focuses on two approaches to management policies and practices: strict protection versus sustainable use of carnivores. As some populations recover, debate shifts to whether and under what circumstances lethal take (often recreational hunting) will be allowed. The ever-changing legal status of wolves in North America – from U.S. Endangered Species Act (ESA) listing to game species listing in each state when ESA protections are removed – displays the potentially strong differences of opinion among conservation professionals (Bruskotter et al., 2014). Debate over whether it is appropriate policy to allow trophy hunting of African carnivores to raise conservation funding is another example, especially in light of the recent controversy over Cecil the lion (Nelson et al., 2016).

Because of the role conservation professionals play in decision-making, interacting with other stakeholders, media and general publics, their contributions are integral to conservation policy and practice. Therefore, their knowledge, experience, values, and perceptions regarding carnivore conservation can have a strong influence on public discourses, policies and conservation outcomes (Heeren et al., 2017). Although deliberation and controversy are healthy and can contribute to important progress in philosophy and policy, too much discord in conservation approaches may stymie decision-making or contribute to the ‘predator pendulum’ observed so clearly in wolf management throughout the Northern Hemisphere and Iberian lynx (*Lynx pardinus*) in Spain (Bruskotter, 2013; Garrote et al., 2013).

A deeper understanding of motivations, justifications, and preferences among conservation professionals can identify areas of consensus and spark new ideas. By identifying areas of consensus, conservation professionals can spend less time in polarizing debate and more time in articulating and advancing “a bolder and more honest vision of biodiversity conservation” to stakeholders and policymakers (Noss et al., 2012). If areas of disagreement are identified, it will be possible to focus research efforts or formal analysis (e.g., using ethics) to explore the nature of these differences. Having such a vision, some argue, is needed to achieve long-term conservation goals rather than short-term political gains (Noss et al., 2012). Consensus is not always appropriate or possible, and can result in longer processes and less effective decisions that cater to the lowest common denominator (Peterson et al., 2005). But where possible and appropriate, building areas of consensus and understanding divergent viewpoints might also foster greater trust in the scientific and policy process among the public, on whom conservation success largely depends.

Given the variety of backgrounds, local contexts, knowledge systems and experiences of conservation professionals, we might expect divergent viewpoints about carnivore conservation among international communities. If this diversity is due to local contexts, homogeneity may exist within regional or national communities. Alternatively, if differences reflect individual values and moral judgments, we would expect to find great variation in viewpoints within regions.

Despite the need, little research has evaluated conservation professionals' viewpoints (Addison et al., 2016; Chapman et al., 2016; Holmes et al., 2016), and very few have focused on international

carnivore conservation (e.g., sharks as discussed in Shiffman and Hammerschlag, 2016). To help fill this gap, our objectives were to characterize viewpoints about terrestrial carnivore conservation among international conservation professionals and explore how these viewpoints relate to disciplinary expertise, background, and broader institutional contexts in which one lives and works. Specifically, we examined participants' support for competing conservation strategies, focusing on the following main gradients: utilitarian vs intrinsic value justifications, land sharing vs land sparing locations, and protection vs sustainable use policies (Mattson et al., 2006; Rastogi et al., 2013; Mace, 2014; Redpath et al., 2017). We thus aimed to get a broad sense of participants' viewpoints about why and where to conserve carnivores, and how to manage them and mitigate human-carnivore conflicts. A novel aspect of the survey was to explore how ascription of intrinsic value, or the inherent right of an entity to exist beyond its use to anyone or anything else, is an important factor in determining when protection is emphasized over instrumental uses or lethal control (Vucetich et al., 2015). This study also explores the extent to which local context vs individual characteristics matters in framing global discourse on human-carnivore coexistence in the Anthropocene.

2. Methods

2.1. Participant recruitment

In December 2015, we recruited 727 participants 18 years or older via email and listserv announcements to complete a web-based survey hosted on Qualtrics (qualtrics.com). Because we wanted to target conservation professionals from diverse fields, we emailed colleagues, posted on our social media accounts, and sent invitations to participate in the survey through five regional groups of the Society for Conservation Biology (Africa, Asia, Europe, Latin America and Caribbean, and North America), The Wildlife Society, Ecolog (a listserv maintained by the Ecological Society of America), the Society for Restoration Ecology and the Large Carnivore Initiative for Europe IUCN/SSC Specialist Group. We asked participants to pass the survey along to their colleagues. Convenience sampling such as this is a common and appropriate approach when conducting exploratory research (Creswell, 2009; Salant and Dillman, 1994).

2.2. The survey instrument

The survey instrument was developed through an iterative process whereby all coauthors, whose interdisciplinary experiences in carnivore conservation ranges from 6 to 22 years and covers North and South America, Europe, Asia and Africa, synthesized relevant topics in relation to carnivore conservation strategies. Selected topics included: ideal goals for carnivore conservation, human-carnivore shared spaces, appropriate areas for conservation, conflict drivers, strategy efficacy, lethal justifications, conservation considerations, coexistence factors, and carnivores' intrinsic value and associated reasons for attributing intrinsic value (defined in Table 1). The survey was pretested by asking colleagues working in diverse sectors of carnivore conservation to complete the survey and provide feedback including coverage of topics, clarity of wording, and time to completion. The survey was then modified and sent to additional colleagues for additional rounds of pretesting.

Boise State University's Internal Review Board approved this research (090-SB15-182). Informed consent was received from all participants; respondents had to first read the informed consent statement and continuing on to the survey was viewed as consent to participate in the study. Participants were then asked a series of close-ended questions within pre-established topics (Table 1), alternating between 5-point Likert scales and multiple-choice statements. Specific phrasing for items in each topic is italicised through the Results section.

The survey concluded with general socio-demographic questions,

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