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Diversity

Political populations of large carnivores

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Society expects governments to implement evidence-based policy to preserve wildlife for future generations, a responsibility often codified in law (Treves et al. 2017*b*). The difficulties of crafting sound policy, however, are pronounced for large terrestrial carnivores. Systems in which humans and carnivores share space are characterized by high mortality of carnivores, threats to human safety, economic loss, and political conflicts (Treves 2009; Ripple et al. 2014; Darimont et al. 2015). Despite common and substantial data deficiencies, estimates of abundance and trend are often central in justifying controversial policies such as hunting, lethal control, and strict protections. Given the political conflict surrounding carnivore population protection or reduction (Nie 2004; Chapron & López-Bao 2014), we contend that reporting of population data (abundance and trend) and associated policies are exceptionally prone to political influence. We hypothesize that some governments and other organizations justify politically preferred policies by over- or underreporting without empirical justification the size or other population data of carnivore populations, creating what we term *political populations* (populations with ecological attributes constructed to serve political interests).

Evidence for political populations is emerging in scholarly scrutiny of government reporting on wildlife population sizes, trends, and associated policy. For example, Popescu et al. (2016) estimated that the Romanian government's population estimates for brown bears (*Ursus arctos*)—the most profitable trophy species in the country—require annual growth rates of up to 50%. This growth rate contrasts sharply with the highest ever reported for the species globally (8% [95% Confidence Limit 3.2–13.6]) (Hovey & McLellan 1996). In contrast, growth rates implied by government population estimates for less commercially valuable species (wolves [*Canis lupus*]; Eurasian lynx [*Lynx lynx*]) rarely exceeded maxima in the literature (Popescu et al. 2016). This suggests the potential inflation of population sizes of brown bears may not be a function of limited scientific capacity or error, rather, it may be deliberate to justify a politically profitable policy.

Although one may expect political populations to arise primarily where governance or scientific capacity is less developed, assessments of government reporting in countries with robust institutions reveal policy that appears uninformed by or contrary to the weight of evidence. For example, after a Provincial Supreme Court decision compelled the government of British Columbia, Canada, to release hunter-related mortality data, research examining management performance of the controversial trophy hunt revealed persistent failure by the provincial government to maintain mortality below its own management thresholds, a risk compounded by ignoring the considerable uncertainty underlying threshold setting (Artelle et al. 2013). Despite the detailed analysis and quantitative solution provided for lowering overmortality risk, the British Columbian government expanded the hunt

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in some areas, claiming in a press release that another study provided evidence of sustainability. This study in fact made no such claim (Artelle et al. 2014). In another example, Creel et al. (2016*a*) argued that policy governing wolves—perhaps the most politically charged of all carnivores—in the United States does not adequately address hunting threats. Specifically, hunting policies could lead to population declines and do not align with ecological theory or data (Creel et al. 2016*a*; Treves et al. 2017*a*).

Additional scientific examination of the bear and wolf systems mentioned above illustrates that the value of the political population concept is to motivate useful scrutiny, not to apply as a permanent label. For example, using previously unpublished information, managers disputed Creel et al.'s (2016*a*) findings (Mitchell et al. 2016), though a dissenting reply by Creel et al. (2016*b*) dismissed the assertions. Similarly, British Columbia government biologists recently responded to Artelle et al. (2013) with renewed claims of sustainability for the grizzly bear hunt (McLellan et al. 2017). Despite lingering dispute and little management change in both systems, any policy context plagued by conflict and uncertainty benefits from additional data, interpretation, and debate. These additions provide richer information on which transparent, adaptive, and ultimately trustworthy policy could be generated and defended by governments. Otherwise, an agency's focus could be viewed as protecting the impression of a sustainable population, rather than addressing risks.

Political populations can also arise when governments pressure scientists to report selective results. In 2017, the Swedish Environmental Protection Agency (SEPA) contracted academics to model the consequences of wolf hunting, but subsequently required them to expunge part of their report. Consequently, the report sent to regional authorities making hunting decisions (Frank 2017) did not contain all available evidence; specifically, new results, which suggest that there might be fewer wolves in Sweden (Chapron et al. 2016), were censored. Remarkably, this censorship was legal because SEPA's general terms and conditions specified that the agency has the right to amend and modify the results it receives from contractors (SEPA 2014).

Governments are not alone in creating political populations. Environmental nongovernmental organizations (eNGOs) can also make dubious claims about carnivore populations. For example, in April 2016, the World Wildlife Fund (WWF) (2016) declared global tiger (*Panthera tigris*) populations "are on the rise" based on increases in "tiger populations in India, Russia, Nepal, and Bhutan; improved surveys; and enhanced protection." The claims were swiftly criticized by 2 other eNGOs—the Wildlife Conservation Society and Panthera (Karanth et al. 2016). They cited peer-reviewed evidence that showed the methods used to derive the population estimates on which WWF based their claims were flawed (Gopalaswamy et al. 2015; Harihar et al. 2017). The initial overoptimism, however, might have provided a perception of successful intervention by WWF.

Some might argue that governments, especially in North America and Europe, build adequate safeguards against political interference. However, although it varies geographically in frequency and intensity, corruption is a global phenomenon that affects natural resource management (Smith & Walpole 2005). Political influence also occurs when special interests have a disproportionately large influence on management decisions (i.e., "agency capture" [Nie 2004; Treves et al. 2017*b*]).

Institutions that mischaracterize the status of wildlife populations can inflict harm not only on wildlife populations but also on society. Environmental NGOs that make unjustified claims of restoration (or inflated losses) can mislead donors and the authorities they aim to advise. Scientists might similarly be captured by eNGO donors and contribute to construction of political populations. In the case of government malfeasance, captured agencies can hide behind authoritative claims of scientific credibility that the public might be inclined to trust.

We encourage academic research that exposes political populations, the possibly risky policies built upon them, and potential political drivers of both. We predict that unreliable population estimates, lack of transparency, and other failures will be more common and severe in jurisdictions where corruption is more pronounced; interest-group penetration of management agencies (i.e., agency capture) is ingrained; controversial species (i.e., those whose protection might harm special interests) are present; and investigative journalism and academic freedom are weak or the social costs of speaking out are high. Some of these predictions may be testable within jurisdictions or by comparisons across jurisdictions.

Given that open data and quantitative science are increasingly common, scientists have unprecedented opportunity and tools to scrutinize wildlife policies and the data underlying them. We propose that agencies and interested third parties (like eNGOs) solicit and sponsor reviews in an independent system of oversight by impartial, qualified scientists, similar to recovery plans for endangered species in the United States. Those conducting reviews should be compensated, although some may consider pro bono contributions (Society for Conservation Biology 2004). Regardless of who sponsors the external scrutiny, the authority of the review product increases if it is subject to a journal-based peer-review process (Carroll et al. 2017).

Given the long time scales on which the peer-review system operates, outreach is also important. Accordingly, we encourage concerned scientists to speak directly to the public about potential malfeasance by governments (Carroll et al. 2017; Goldman et al. 2017) or misinformation provided by other interest groups. We understand

that exposing the potential for political populations brings risk to funding and credibility and that academic freedom may not always provide a necessary bulwark (Treves et al. 2017*b*).

Increased scrutiny could pressure governments to present wildlife data and policies crafted by incorporating key components of science: transparent methods, reliable estimates (and their associated uncertainties), and intelligible decisions emerging from both of them. Minimally, if it is accepted that governments may always draw on politics, new oversight by scientists would allow clearer demarcation between where the population data begin and end in policy formation (Creel et al. 2016*b*; Mitchell et al. 2016). Undeniably, social dimensions of management (i.e., impacts on livelihoods and human–wildlife conflict) will remain important.

Our vision for a new domain of applied conservation science is applicable to large carnivores and other systems in which academics and others hold governments and interest groups accountable (Janssen & Chng 2017). We accept that increased scrutiny will not often provide evidence for if, how, and why political interference occurred; rather, it will reveal if reported population data on which policy is based are unreliable. Applied vigorously, increased oversight could transform the process of how humanity's natural legacy is passed to future generations.

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