



# Large carnivore hunting and the social license to hunt

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**Abstract:** The social license to operate framework considers how society grants or withholds informal permission for resource extractors to exploit publicly owned resources. We developed a modified model, which we refer to as the social license to hunt (SLH). In it we similarly consider hunters as operators, given that wildlife are legally considered public resources in North America and Europe. We applied the SLH model to examine the controversial hunting of large carnivores, which are frequently killed for trophies. Killing for trophies is widespread, but undertaken by a minority of hunters, and can pose threats to the SLH for trophy-seeking carnivore hunters and potentially beyond. Societal opposition to large carnivore hunting relates not only to conservation concerns but also to misalignment between killing for trophies and dominant public values and attitudes concerning the treatment of animals. We summarized cases related to the killing of grizzly bears (*Ursus arctos*), wolves (*Canis lupus*), and other large carnivores in Canada, the United States, and Europe to illustrate how opposition to large carnivore hunting, now expressed primarily on social media, can exert rapid and significant pressure on policy makers and politicians. Evidence of the potential for transformative change to wildlife management and conservation includes proposed and realized changes to legislation, business practice, and wildlife policy, including the banning of some large carnivore hunts. Given that policy is ultimately shaped by societal values and attitudes, research gaps include developing increased insight into public support of various hunting policies beyond that derived from monitoring of social media and public polling. Informed by increased evidence, the SLH model can provide a conceptual foundation for predicting the likelihood of transient versus enduring changes to wildlife conservation policy and practice for a wide variety of taxa and contexts.

**Keywords:** animal use, conservation, social license to operate, stakeholders, wildlife

Cacería de Grandes Carnívoros y la Licencia Social para Cazar

**Resumen:** El marco de trabajo de la licencia social para operar considera cómo la sociedad otorga o restringe permisos informales para que los extractores de recursos puedan explotar los recursos públicos. Desarrollamos un modelo modificado, al cual nos referimos como la licencia social para cazar (LSC). En este modelo consideramos a los cazadores como símiles de los operadores puesto que en América del Norte y en Europa a la fauna se le considera legalmente como recurso público. Aplicamos el modelo de la LSC en un análisis de la cacería controversial de grandes carnívoros, a los cuales con frecuencia se les caza para convertirlos en trofeos. La cacería para trofeos es común pero sólo la realiza una minoría de los cazadores y puede presentar una amenaza para la LSC para los cazadores que cazan carnívoros para trofeos e incluso para otros tipos de cazadores. La oposición social a la cacería de grandes carnívoros se relaciona no sólo con el interés de conservación sino también con la discordancia entre la caza para trofeos y las actitudes y valores públicos dominantes con respecto al trato hacia los animales. Resumimos algunos casos relacionados con la muerte de osos pardos (*Ursus arctos*), lobos (*Canis lupus*) y otros grandes carnívoros en Canadá, los Estados Unidos y Europa para mostrar cómo la oposición a

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la cacería de grandes carnívoros, hoy en día expresada principalmente en las redes sociales, puede ejercer una presión rápida y significativa sobre los políticos y los formuladores de políticas. La evidencia de un potencial de cambio transformador en el manejo y conservación de fauna incluye los cambios propuestos y realizados a la legislación, la práctica comercial y las políticas para la fauna, incluyendo la prohibición de la caza de algunos grandes carnívoros. Ya que las políticas están finalmente moldeadas por las actitudes y los valores sociales, las lagunas en la investigación incluyen el desarrollo de un conocimiento mejorado del respaldo público para varias políticas de cacería más allá del conocimiento derivado del monitoreo de las redes sociales y las encuestas públicas. Si se informa con mucha más evidencia, el modelo de la LSC puede proporcionar una base conceptual para predecir la probabilidad de los cambios transitorios versus los duraderos en las políticas y las prácticas de conservación de fauna para una gama amplia de taxones y contextos.

**Palabras Clave:** actores sociales, conservación, fauna, licencia social para operar, uso animal

**【摘要】:** 社会经营许可框架关注社会如何对开发公有资源的开采者授予或保留非正式的许可。本研究开发了一个修改后的模型,我们称之为社会狩猎许可。考虑到野生动物在北美和欧洲被合法地视为公共资源,我们也将狩猎者视为经营者。我们将社会狩猎许可模型用于研究受到争议的大型食肉动物狩猎,它们经常作为战利品狩猎动物。战利品狩猎十分普遍,但只有少数狩猎者参与,它可能会威胁到寻求战利品狩猎的食肉动物狩猎者和其他狩猎者的社会狩猎许可。社会反对大型食肉动物狩猎不仅与保护有关,还由于为战利品而捕杀动物与对待动物的主流公共价值观和态度之间不协调。我们总结了加拿大、美国和欧洲捕杀灰熊 (*Ursus arctos*), 狼 (*Canis lupus*) 和其它大型食肉动物的案例,来说明目前主要在社会媒体表达的对大型食肉动物狩猎的反对,如何对决策者和政治家快速施加重大压力。野生动物管理和保护可以实现转型性变革的证据包括提出和实现立法、经营方式和野生动物政策方面的改变,包括禁止捕杀一些大型食肉动物。由于政策最终是由社会价值观和态度塑造的,目前的研究空缺还包括除了通过监控社交媒体和公众投票外,更深入地理解公众对各种狩猎政策的支持情况。有了越来越多的证据后,社会狩猎许可模型可以为预测野生动物保护政策和实践在广泛的类群和环境中发生短暂及持续变化的可能性提供一个概念基础。【翻译:胡怡思;审校:聂永刚】

**关键词:** 动物利用, 保护, 社会经营许可证, 利益相关者, 野生动物

## Introduction

Conceived in the context of mining and forestry, social license to operate (SLO) emerged as an influential framework in stakeholder theory . in which operators seek, receive, maintain, and lose permission by society to exploit publicly owned resources. Given that the public can respond to impacts imposed by resource exploitation, so-called stakeholders can exert powerful agency; social and political processes they initiate and shape can exert significant influence on regulators (Freeman 1984; Wilburn & Wilburn 2011). Here we build on work at the intersection of SLO, conservation, and animal use (Kendal & Ford 2017; Hampton & Teh-White 2018) to show that the SLO framework can provide a useful model for understanding the public's ability to influence the social license granted to hunters. We refer to the concept as social license to hunt (SLH). As with all new theory, evidence for mechanistic linkages between societal opposition and policy change is currently limited. Case studies we considered, however, inform the conceptual framework.

We illustrate SLH in the context of the often contentious killing of large carnivores and consider how the significant and enduring controversy stems from the reality that large carnivores are often killed not to acquire food, but instead to acquire trophies. We define large carnivores as larger species in the family Carnivora (Ripple et al. 2014), such as bears (*Ursus* spp.), cougars

(*Puma concolor*), and wolves (*Canis lupus*). Although trophy hunting also refers to the targeting of particular traits within populations (e.g., large body or ornament size), we focused on another dimension of the behavior, namely, hunting to acquire carcass parts as tangible signals of achievement to display to others (Darimont et al. 2017a). We argue specifically that the killing of large carnivores for trophy and not food, conducted by few hunters, has potential to threaten the SLH afforded to the larger group who hunt for food. We used the SLH concept to provide fresh insight that may explain how large carnivore hunting is vigorously criticized not only because of conservation concerns for these uniquely valuable species in ecosystems but also because the activity conflicts with commonly held societal values and attitudes regarding the treatment of nonhuman animals. Given such conflict, we argue that transparent and conciliatory dialogue within and beyond hunting communities will be key if retaining minimally challenged SLH is of interest to hunters.

## Social License to Hunt

Systems characterized by the often-contentious hunting of predators lend themselves well to stakeholder theory. We note that the SLH framework differs from other conceptual models that center hunters as stakeholders (e.g., Decker et al. 1996). Rather, in the social license

literature, those who extract resources are instead considered operators. Specifically, like logging or mining, hunting is an activity in which a few operators exploit resources typically considered public in Western democracies. Relatedly, given that Indigenous legal tradition and contemporary practice do not recognize wildlife as a public good belonging to all inhabitants of colonial nation states (Eichler & Baumeister 2018), we excluded Indigenous peoples—who have inherent and inalienable rights to hunt—from consideration as operators.

Against this grounding, we considered 2 other key elements underlying the relevance of stakeholder theory to hunting. First, hunters are indeed few. Participation in hunting, particularly in Canada, the United States, and Europe, is generally <10% of the general population, dominated by men, and declining (Heberlein et al. 2008; Schulp et al. 2014; Aiken 2019; Wilkins et al. 2019). Though falling, participation rates remain marginally higher in rural versus urban areas (Wilkins et al. 2019). Absolute participation in the United States is roughly equal (47% urban and 53% rural) (U.S. Fish and Wildlife Service 2016), proportions that reflect vastly more people living in urban areas. Those who specifically target large carnivores represent a modest subset of all hunters. Across the United States, for example, a 2016 survey found that only 2% of hunters are associated with bear (*Ursus* spp.) hunting, and that hunting associated with other large carnivores—some of which were historically extirpated from many states—was too sparse to constitute a category (U.S. Fish and Wildlife Service 2016). Given that such low participation may link to reduced opportunity, data from states that still contain large carnivores add increased context. Treves and Martin (2011) found that in Wisconsin, self-identified large carnivore hunters constituted 23% of a random sample of 1284 and that in Wyoming, Idaho, and Montana, wolf or bear hunters constituted 18% of 421 sampled.

Second, hunting faces opposition from nonhunters who are increasingly recognized to hold and exercise nonextractive rights to wildlife, making them so-called vested stakeholders. Perceived impacts can take multiple forms, including competition with nonconsumptive activities (e.g., birdwatching, hiking) (Vaske et al. 1995). Further conflict relates to the loss of individuals within wildlife populations valued for their cultural importance and recognized interrelatedness with humans (e.g., Bhattacharyya & Slocombe 2017; Artelle et al. 2018a). Additional opposition arises from concerns over animal welfare (Hampton & Teh-White 2018).

Although mechanistic explanations have not been elucidated, we suggest that prevailing values relating to wildlife likely underlie opposition to the hunting of large carnivores. How society relates to wildlife has changed significantly in North America and Europe over recent decades. Manfredo et al. (2018), for example, found that wildlife value orientations in the United States have

shifted from traditionalism (the valuation of wildlife based solely on their use and benefit for people) to mutualism (the human dimensions term relating to the valuation of animals as part of extended social networks with humans and as deserving of basic consideration similar to those humans receive) during the last few decades. The largest category among survey respondents in their recent study (35%) was mutualism, followed by traditionalism (28%), pluralism (i.e., holding both values) (21%), and distanced (no strong values) (15%). Similar patterns exist in Europe, where most surveyed participants were mutualists (32%) or distanced (32%) (Gamborg & Jensen 2016). Among surveyed hunters in North America, value orientations vary geographically, but they are more frequently traditionalist (38%) and pluralist (33%) than mutualist (5%) (Manfredo et al. 2018). The prominence of mutualism and pluralism across the larger society, however, is consistent with opposition to the killing of large carnivores. Simply put, we hypothesize that people holding those values likely oppose activities like trophy hunting because they reason that the benefits to hunters (i.e., trophies) do not justify the violation of basic care for animals.

Against this background of values, data on public attitudes reveal additional context to explain why support for the killing of large carnivores, or any species for trophies, is generally low. Responsive Management (2019) reported that approval for ungulate and wild turkey (*Meleagris gallopavo*) hunting in the United States ranges from 66% to 78%, which is substantially higher than approval for hunting of black bears (*Ursus americanus*) (44%), grizzly bears (40%), cougars (39%), and wolves (38%). Approval of hunting for meat was 84%, whereas approval of hunting any taxon for the purpose of acquiring a trophy was 29% (Responsive Management 2019). Given these data, we suspect that SLH will remain tenuous for the killing of large carnivores that are not commonly eaten and presumably instead are often killed for trophies (e.g., grizzly bears, canids, and felids).

Additional theory and data are required to understand that even when they are killed for multiple reasons, large carnivores possess particular characteristics that attract opposition to their killing. As background, hunters of any taxa generally pursue 1 or more tangible outcomes: food, trophies, perceived population control, and so on. For example, both black bears and many large herbivores (e.g., elk [*Cervus canadensis*], big horn sheep [*Ovis canadensis*]) are commonly killed for meat and trophies. We note, however, that popular referenda in the United States proposing to modify or ban ungulate hunting have been limited to 1 (to ban an open season on moose [*Alces alces*] in Maine in 1983), whereas those regarding black bear hunting alone have been subject to at least 8 referenda, joining others on canids and felids (National Conference of State Legislatures 2020).

Additional human dimensions data help explain this pattern. Namely, hunters receive different satisfactions from hunting (Hendee 1974). These satisfactions include “appreciation” (enjoyment of experience), “affiliation” (enjoyment of other’s company), and “achievement” (enjoyment relating to performance) (Hendee 1974). Recent analyses of stories posted to online hunting forums from across Canada and the United States showed that although hunters often express multiple satisfactions in hunting stories about varied taxa, achievement satisfaction (which aligns with trophy taking) is particularly common in stories about large carnivore hunting (Ebeling-Schuld & Darimont 2017). Collectively, these patterns suggest that large carnivores, such as bears, cougars, and wolves, not only have characteristics that make them attractive trophies (Darimont et al. 2017a; Mihalik et al. 2019), but also comprise prey for which hunts will be subject to societal opposition. We suspect, therefore, that SLH more broadly will be contingent and relate to how stakeholders perceive the extent to which motivations map to killing wildlife for food versus other goals (e.g., trophies, target practice in the case of small mammals).

These patterns suggest that large carnivore hunting is vulnerable to erosion of SLH. In considering the mechanism, we specifically refer to an updated SLO model offered by Garnett et al. (2018), which invoked political processes. These authors argue SLO is granted when operators satisfy enough of the stakeholders’ interests to convince governmental agencies that legislative conditions are met and that there is political gain, or at least no risk, in such granting of SLO. We argue, and provide evidence with case studies below, that in the case of large carnivore hunting the inverse can also be true: if policy makers perceive that hunters fail to satisfy (or have lost) SLH, the apparent political risk of maintaining regulatory approval can provoke policy change.

## Social Media and Transformative Change

Social and political processes can now sometimes usher in change at an unprecedented pace, in large part driven by social media. For example, online movements have rapidly transformed politics (e.g., the Arab Spring; 2016 and 2020 U.S. presidential elections), as well as society more broadly (e.g., the Black Lives Matter and Me Too movements) (Mundt et al. 2018). Although arguably less rapidly, social media can also influence resource management (e.g., Kohl et al. 2019). For example, online campaigns influenced public attention on the Dakota Access Pipeline protests by the Standing Rock Sioux tribes and allies, leading to changed regulatory processes and routing (until a new federal administration overturned the adjustments) (Hunt & Gruszczynski 2019).

## Social License to Hunt, Social Media, and Policy Change

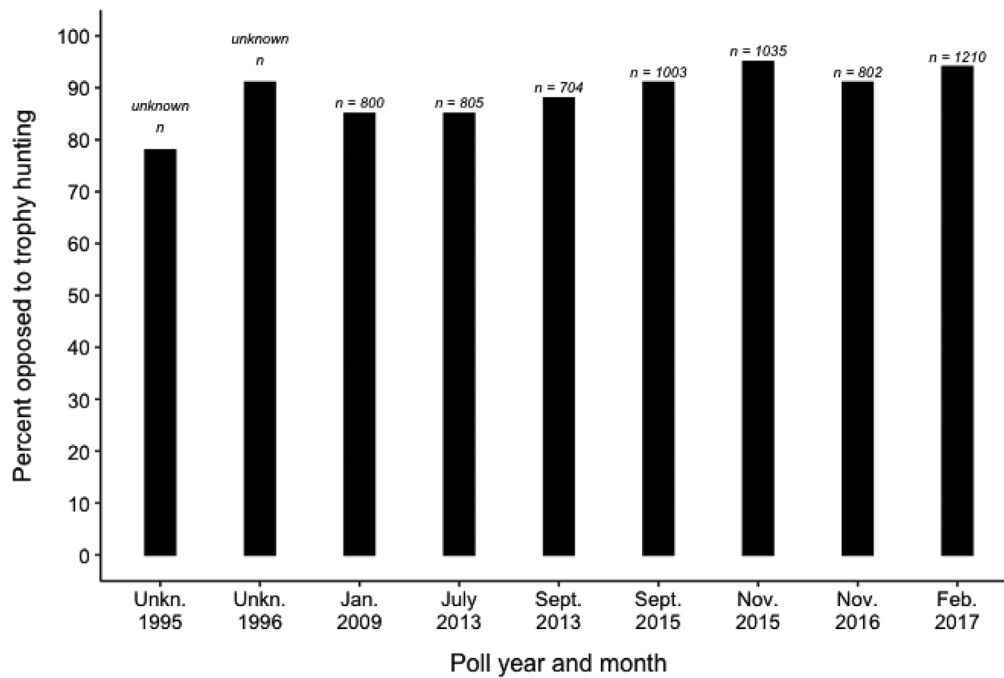
Similarly rapid change can occur in wildlife policy, building on a history of slower, socially and politically mediated processes. In the United States, for example, SLH for several species in multiple states has been challenged over decades through a series of public-initiated ballot measures. Proposed changes often targeted large carnivore hunting and associated methods. Outcomes included banning hunting of mountain lions in California, the spring black bear hunt in Colorado, and bans against using bait and dogs (*Canis lupus familiaris*) in Colorado bear hunting, and similar or other means to hunt or trap large carnivores in Washington, Oregon, California, and Massachusetts (National Conference of State Legislatures 2020).

Although ballot measures represent slow-moving direct democracy, multiple examples suggest that social media can now invoke rapid change, particularly if charismatic wildlife are killed. A catalyst scenario was seemingly initiated in 2015 following the trophy hunting of a radio-collared African lion (*Panthera leo*) known as Cecil. MacDonald et al. (2016) speculated that society’s influence on wildlife conservation may have been changed significantly, reporting global saturation at unparalleled speed (approximately 2 days) via traditional and social media posts—most of them expressing outrage.

## Representative Case Studies

Several recent examples highlight how governments and businesses took rapid steps, some of which led to enduring policy change. For example, following Cecil’s killing, a flurry of related legislation or policy proposals ensued in the United States, France, United Kingdom, India, and Australia (Carpenter & Konisky 2017). As with most proposed legislative changes, more failed than passed. Three U.S. bills had Cecil’s name, but none became law. Carpenter and Konisky (2017) inferred that the surge in public attention had only limited influence on new policy but may have increased the speed at which existing proposals were considered by policy makers. Businesses, however, rapidly changed policies. More than 40 airlines adopted or reaffirmed bans on the shipment of animal trophies following Cecil’s death (Carpenter & Konisky 2017). We note, however, that the legal and commercial changes proposed or enacted originated outside of Zimbabwe, where Cecil lived. This suggests that local action does not necessarily follow global outcry.

Though drawing on longer histories, similar calls for bans on hunting large carnivores have occurred elsewhere. In British Columbia, Canada, poll data (in the



**Figure 1.** Public opinion polls in British Columbia, Canada, showing opposition to sport and trophy hunting (of bears and in general). Where reported, polls had margins of error range from 2.2% to 3.7% (Supporting Information).

context of hunting bears, and trophy or sport hunting more generally) (Appendix S1) consistently showed substantial opposition (>80%) over the last 2 decades (Fig. 1). Flagship opposition revolved around the trophy hunting of grizzly bears, especially in coastal British Columbia. Vested stakeholders opposed to the hunt included conservation and animal welfare groups, as well as ecotour operators (Carpenter 2015). Despite enduring opposition, and a short-lived province-wide ban in 2001, the hunt continued (Artelle et al. 2013). Driven in part by social media, however, Indigenous governments and partnering organizations in coastal areas led the final campaign. Traditional and social media coverage of the killing of an individual coastal bear (named Cheeky) by a National Hockey League player in 2013 drew global opposition (e.g., Bears Forever 2013; Carpenter 2015), which was sustained through scientific, political, and campaign developments thereafter. In 2017, a new provincial government banned the hunt, citing widespread opposition owing to misaligned values (Darimont et al. 2017b). In the press release, then Minister Doug Donaldson stated, “Through consultations this past fall, we have listened to what British Columbians have to say on this issue and it is abundantly clear that the grizzly hunt is not in line with their values” (Province of British Columbia 2017).

Examples from other areas showed similar patterns. In Romania, although no individual animal played a flagship role, similar public pressure contributed to hunting bans for brown bears, wolves, and lynx (*Lynx lynx*) (Dale-

Harris 2016). Hunt closures for black bears have also occurred following public opposition in Florida, where the Fish and Wildlife Conservation Commission suspended the hunt in 2019 (e.g., Brasileiro 2019). Additionally, the killings of 2 well-known Yellowstone wolves that wandered outside park boundaries, 0-Six and Spitfire, and Bear 148 of Banff National Park, sparked online petitions and widespread public disapproval (Pearson 2017; Horton 2018). This opposition, however, has not resulted in changes to hunting regulations.

## SLH and Conservation

The erosion of SLH for large carnivore hunting and resulting bans carry significant, varied, and uncertain conservation implications. Although particularly relevant to areas outside Canada, the United States, and Europe, negative conservation effects could include reduced incentives for local people reliant on hunt-related revenue to safeguard wildlife and their habitat (Di Minin et al. 2016). Also, whether illegal killing may increase without legal hunts is hotly debated (e.g., Chapron & Treves 2016). Additionally, the minority who advocate for continued hunting of large carnivores could jeopardize partnerships between hunters and public stakeholders otherwise united against other threats (e.g., habitat destruction). Conversely, positive outcomes may include reduced human-carnivore conflict, given that the exploitation of large carnivores can be associated

with increased levels of subsequent conflict (e.g., Teichmann et al. 2016). Additionally, bans that remove what is often the largest source of adult mortality from carnivore populations (Darimont et al. 2015) may improve population health and resilience, especially if preban quotas are based on overly optimistic population assessments (Popescu et al. 2016; Darimont et al. 2018). More broadly, potentially cascading and interacting effects might be complex in cases in which hunting influences densities, age structures, behaviors, and community interactions. Research following moratoria on animal exploitation has been rare (Laner et al. 2010; Martínez-Abraín et al. 2013; International Whaling Commission 2020), restricting our predictive abilities.

### Predicting the Future of SLH

Anticipating the future of SLH might be equally complex. In other domains, new public expectations arise so that social license requirements usually become more stringent as public stakeholders learn to exercise power (Dare et al. 2014). New test cases will flare up on social media. For example, a well-publicized wolf known as Takaya, who lived for 8 years on a small archipelago off a metropolitan city in British Columbia (Victoria), was recently killed by a hunter and has emerged as an ambassador in new campaigns against wolf hunting (Darimont et al. 2020).

Transitioning from case-by-case scenarios to broader understanding could help predict the likelihood and longevity of potential policy changes. Some campaigns will not lead to change. Signals of protest, for example, may be dampened in a noisy environment of online campaigns. Despite the growing influence of collective moral reflexivity regarding the killing of animals, some campaigns do not become prominent. For example, the killings of other well-known individuals in captive and wild populations (e.g., Marius the giraffe [*Giraffa camelopardalis*], Harambe the gorilla [*Gorilla gorilla*], and Xanda [Cecil's cub]) were neither widely known nor led to change (Mkono & Holder 2019).

Against this background, we expect both resistance to change as well as adaptation by those seeking to maintain SLH. Despite their small numbers, hunters can influence management agencies via powerful collectives (e.g., fish and game associations) (Clark & Milloy 2014). Intensity of resistance may scale with how bans could threaten livelihoods or perceived rights to traditions. Following the ban on mountain lion hunting in California in 1990, 11 U.S. states passed other referenda that sought to prevent future challenges to hunting; only 1 in Arizona failed (National Conference of State Legislatures 2020). Specific proposals in 1996 to repeal bans on cougar hunting in California and black bear and cougar hunting methods in Oregon, however, both failed (National Conference of

State Legislatures 2020). Contemporary analogues could materialize as online campaigns highlighting potential economic and population- or ecosystem-level benefits of large carnivore hunting. Moreover, hunters might adapt by concealing online trophy displays, given their tendency to elicit viral condemnation. We suspect any change will be slow and modest, however, given the deep evolutionary drivers of such status-enhancing behaviors (Darimont et al. 2017a).

We also expect resistance to change from wildlife scientists and managers. Although more data would provide increased insight, one reason for resistance could be that many wildlife professionals in North America and Europe hold values that diverge from the public. Recent data from the United States show that although 34% of the public identify as mutualists, only 8% of agency employees do (Manfredo et al. 2018). Although new generations of wildlife professionals are more likely to hold values similar to the public (Gill 1996; Muth et al. 2002), the values of many currently in the field are mismatched with the public, perhaps because they work within a professional culture upheld by institutions that promote wildlife exploitation (Kennedy 1985). Additionally, some scientists and managers may assert that opposition to large carnivore hunting that is estimated or assumed to be numerically sustainable is somehow unscientific. These claims, however, are not consistent with the reality that only values can justify whether an activity is tolerated by society (Artelle et al. 2018a) and thus subsequently subject to management. Moreover, some managers, scientists, and advocates for hunting may view society's investments in campaigns against large carnivore hunting as misdirected conservation efforts (i.e., that could instead be placed on other threats) (Dickman et al. 2019). Although some groups opposed to large carnivore hunting indeed maintain narrow interests (e.g., animal rights advocates), concern for individuals and the suffering they endure scale up to population-level concerns about habitat (Paquet & Darimont 2010). Finally, scientists and managers may resist change if politicians, swayed by their electorate, direct agencies to alter policy without deliberative governance processes. Ballot measures, for example, were criticized as "tyranny of the majority" by Williamson (1998), who argued that the consumptive-user minority could not oppose such measures. However, some argue that special interests of relatively few consumptive users have historically enjoyed a disproportionately large influence ("tyranny of the minority") on management decisions (i.e., "agency capture") (Nie 2004).

Regardless of disagreements, the longevity of bans will also likely depend on the receptivity of government to the competing interests of stakeholders and operators. In the Romanian example above, the government faced backlash to the hunt bans after accusations of failures to design compensation programs for farmers and

alternative measures to prevent human–predator conflict (Popescu et al. 2019). Hunting of wolves and brown bears (but not lynx) was subsequently reinstated, though quotas are now approximately half (Hartel et al. 2019). In contrast, in British Columbia and despite a lawsuit against the government by hunting guides (McIntyre 2018), the grizzly bear hunt remains banned, likely because of the strong and enduring public opposition to trophy hunting (Fig. 1). Public polling data in most systems, however, are rare.

Given the rarity of existing data, governments require reliable information on SLH via social science research. Clearly, examination of policy options requires more than solely studies of animal populations (Bennett et al. 2017). This is because online opposition to hunting (or bans) cannot provide a detailed picture of the public's position on various policies required by decision makers. Examinations must go beyond estimating how opposition might vary by species or method of hunting. An important general step will be separating evidence claims (e.g., hunting large carnivores provides benefits or costs) from value claims (e.g., hunting large carnivores should or should not be allowed) in the public policy debate. Such demarcations allow nontechnical constituents clarity on when they can engage on questions of values; technical experts can also be clearer about where the science begins and ends in these debates (Artelle et al. 2018b). Finally, some have argued persuasively that wildlife management lags behind other applied scientific and associated governance systems in transparently engaging with ethics to confront controversial policy (e.g., Nelson & Vucetich 2012). More broadly, and as case studies accumulate, testable hypotheses can be confronted to identify the social dimensions that predict whether and how SLH will be lost or maintained.

### Safeguarding the Broader SLH

The erosion of the SLH for one type of hunting may affect another. Indeed, some hunters may be concerned that opposition to large carnivore hunting could lead to the eventual ban of more popular and socially accepted food hunting. More than 15 years ago, noting their collective influence, Peterson (2004) suggested that the nonhunting majority would dictate the future of hunting. Theory and data from SLO, however, indicate that the hunting community can choose to adapt to confront such challenges. In other domains, operators can proactively manage their license by aligning their behavior to the values and associated expectations of societal stakeholders; less-effective outcomes often follow defensive or aggressive responses to mounting public pressure (Wilburn & Wilburn 2011). In the case of large carnivore hunting, such defiance could potentially jeopardize opportunities for food hunting in some contexts and

areas. Indeed, both forms of hunting are often advocated for by the same groups, managed by the same agencies, and, occasionally, conducted by the same people.

If retaining a broader and minimally challenged SLH is of interest to food hunters, transparent and conciliatory dialogue within and beyond hunting communities about hunting will be key. In the context of stakeholder theory, those who exploit natural resources need to participate in collaborative consultation processes to gain legitimacy, credibility, and—ultimately—trust among the general public (van Putten et al. 2018). Given data on contemporary values and attitudes, how support can be earned for the hunting of large carnivores for trophies is far less certain than its maintenance related to food hunting. In fact, support for hunting large carnivores may be tenuous even among hunters; those who subscribe to the North American model of conservation (a hunting-centric model) (Organ et al. 2012) may acknowledge that killing large carnivores for trophies (and not food) contravenes one of the model's central tenets—that wildlife may only be killed for legitimate, nonfrivolous purposes. An additional source of uncertainty is how responses to these potential threats by hunting collectives (e.g., fish and game associations), constituting diverse perspectives but with less robust executive and communications capacity, may differ from commercial enterprises with well-developed central leadership and administration.

Regulatory change occurs when governments attempt to resolve conflicting dimensions on which decisions are made. Although science provides information to describe and predict ecological and social processes, societal values are not easily translated into policy. Politics and economics can shape policies with competing values, but are insufficient by themselves. Clearly, majority approval alone should likewise not provide a compelling case for change, especially if issues pertain to fundamental rights and social inequalities (Adeola 2001). Thus, policy makers will surely wrestle with vexing dilemmas in this new era. Clearly, the public increasingly expects a more robust and compassionate ethical mode of operation from animal recreation industries (Mkono & Holder 2019), a reality extendable to hunting. We suggest that the SLH concept provides a useful model to which natural resource scientists, policy makers, and the public can refer during what will surely be continued—and vigorous—debate about large carnivore hunting.

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### Supporting Information

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