



Problem Perspectives and Grizzly Bears: A Case Study of Alberta's Grizzly Bear Recovery Policy

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Since their threatened species listing in 2010, grizzly bear recovery has been a controversial policy issue in Alberta, Canada particularly because this charismatic carnivore represents a diverse set of values, both positive (e.g., an icon of beauty and the wilderness) and negative (e.g., a safety threat and economic risk to peoples' livelihoods). Previous human dimensions research on grizzly bear conservation has accounted for the values and attitudes different groups of people hold for these bears, as well as their views on conflict mitigation strategies. However, the conservation literature is more limited in assessing the perspectives different people hold for grizzly bear conservation in a policy context. Arguably, understanding the policy landscape in which carnivore conservation occurs is important to achieve desired goals and objectives for species and the people expected to live with them and implement policy action. Using a case study approach between 2012 and 2014 and borrowing from the policy sciences problem-oriented framework, we identify the dominant problem perspectives in Alberta's grizzly bear recovery policy using document review and interviews with participants from government, the natural resource sector, and environmental non-governmental organizations. We identify that ordinary and constitutive problem perspectives share common features across participants in this study, including frustrations with lack of policy clarity, implementation inefficiencies and committed political and financial action, and perhaps even more important, the challenges in policy decision-making and governance. We discuss the importance of meaningful engagement of people who live with large carnivores and the impacts of conservation policy, which is applicable to both a local and global scale, as success in large carnivore conservation must include the people who will ultimately implement conservation action.

Keywords: case study, grizzly bear, interviews, policy sciences, policy problem

INTRODUCTION

Grizzly (brown) bears (*Ursus arctos*) in Canada have been extirpated from much of their historic range, with human-caused mortality recognized as a primary threat to the species' survival across its North American distribution (Nielsen, 2005; Committee on the Status of Endangered Wildlife in Canada [COSEWIC], 2012; McLellan et al., 2017). This includes Alberta, Canada's grizzly bear

populations, which overlaps multiple human land uses along the Rocky Mountain front extending north into the boreal landscape (Nielsen et al., 2009; Morehouse and Boyce, 2017). Grizzly bear mortality in the province is largely a result of direct human conflict (e.g., livestock depredation, public safety incidences), illegal killing, or accidental death (e.g., motor vehicle collisions) (Alberta Sustainable Resource Development, 2008). Habitat loss and fragmentation are also of concern to the long-term sustainability of Alberta's grizzly bears (Alberta Environment and Parks, 2016).

To address mortality and population sustainability concerns, in 2010 Alberta's grizzly bears were listed as a threatened species, with an estimated population of approximately 700 bears distributed across more than 170,000 km² (Alberta Environment and Parks, 2016). Grizzly bears are protected by a provincial recovery policy which uses the best available biological data to formulate policy guidelines and management actions for bears, including instating a 2006 hunting moratorium, conducting population and habitat research, implementing strategies to reduce human linear footprint, and developing educational outreach activities (Alberta Environment and Parks, 2016). To date important steps have been taken to help fulfill recovery objectives across all Bear Management Areas (BMA). This includes completing population inventories, habitat research and treatments, and educational outreach (Nielsen et al., 2006; Alberta Environment and Parks, 2016). Despite much positive work, the public engagement and consultation processes previously used have been controversial for some people, with opinions differing on how best to move forward on grizzly bear recovery.

While Alberta's grizzly bears are valued as a charismatic species symbolizing the rugged beauty of the wilderness, they also elicit fear, present safety risks, and sometimes negatively impact livelihoods (Black, 1998; McFarlane et al., 2007; Gibeau, 2012; Richie et al., 2012). Further complicating this are the different types and intensities of human land use across each BMA, including residential developments, Indigenous communities, forestry, agriculture, mineral and petroleum industries, and recreational use (Festa-Bianchet, 2010; Statistics Canada, 2013; Alberta Environment and Parks, 2016). Inevitably, these different land uses enable opportunities for people and bears to interact, which can result in positive or negative encounters (e.g., tourism bear viewing, livestock conflict, human safety risk) (Alberta Environment and Parks, 2016). Current attempts through the recovery policy to reduce the likelihood of negative interactions include setting thresholds for human footprint, creating guidelines for attractant management (e.g., electric fencing), and implementing educational outreach (Alberta Environment and Parks, 2016). However, policy implementation can be challenging given that different people have different knowledge and experiences with grizzly bears, different normative thoughts on what should be done about bear management, and different familiarity with recovery policy (Nate Webb, personal communications, 2011). Added to this, grizzly bear recovery is potentially even more challenging in BMAs with stable to increasing populations and increasing

human-bear conflicts (Alberta Environment and Parks, 2016; Morehouse and Boyce, 2017; Coogan et al., 2018). Further compounding the complexity of policy implementation are the different views people across different BMAs may have of bear populations, which may influence their support or opposition to recovery actions (Hughes and Nielsen, 2019). This is not unlike conflicts in conservation policy elsewhere (e.g., caribou, elk, grizzly bears, wolves), which include problems in policy design, stakeholder engagement, governance, and values-based disputes (Nie, 2003; Wilson and Clark, 2007; Bixler, 2013; Young et al., 2016; Skogen, 2017).

Previous human dimensions research has examined people's attitudes and knowledge toward grizzly bears and other species, as well as their support or opposition to conservation strategies (McFarlane et al., 2007; Ebbin, 2011; Young et al., 2015; Slagle et al., 2017). Despite understanding attitudes and preferences for action, disputes around the design and implementation of conservation policy persists, in Alberta and elsewhere (Serenari et al., 2018). Given that policy is intended to help achieve specific goals in the interest of the public good, conservation practitioners increasingly recognize the importance and central role that different people play in conservation (Chase et al., 2002; Gibeau, 2012; Bixler, 2013; Nastran, 2015). This includes understanding the problem perspectives from the people expected to live with large carnivores and implement desired management actions (Clark et al., 2009; Clark and Slocombe, 2011; Hughes and Nielsen, 2019). Arguably then, the challenges to grizzly bear conservation success are more about decision-making processes and issues of legitimacy, power, trust, and respect rather than people's attitudes toward bears (Clark et al., 2008; Rutherford et al., 2009; Gibeau, 2012; Richie et al., 2012; Clark and Vernon, 2017).

Our case study of Alberta's grizzly bear recovery policy, conducted between 2012 and 2014 shortly after the 2010 listing and release of the recovery plan, borrows from the policy sciences problem-oriented approach to uncover the problem perspectives from the people who live, work and recreate in bear country (Laswell, 1971; Vernon and Clark, 2015). A problem-oriented approach is a systematic process to uncover different peoples' perspectives and characterizations on a particular policy problem, in addition to examining the trends and conditions influencing past and present policy trajectories (Laswell, 1971; Nie, 2001; Clark, 2002; Clark et al., 2008, 2014; Reed, 2008; Rutherford et al., 2009; Muntiferling et al., 2017). This approach has been used in North America with regards to grizzly bears, polar bears, elk and other carnivore conservation challenges (Primm and Clark, 1996; Clark et al., 2008, 2017; Ebbin, 2011; Richie et al., 2012; Clark and Vernon, 2017). Within this framework, a policy problem is described as the disparity between what people want to happen and what actually does happen (Clark et al., 2014; Redpath et al., 2015). Defining a policy problem is "really about the social significance of a situation, its meaning, implications, and urgency" (Clark, 2002, p. 100; Primm and Clark, 1996). Different people will have different interpretations and experiences with policy, which can have broader implications for policy implementation including whether or not policy is viewed as legitimate (Clark, 2002; Clark et al., 2008;

Feldpausch-Parker et al., 2017; Lopez-Bao et al., 2017). In turn, this can affect public acceptance and the adoption of desired actions (Lopez-Bao et al., 2017).

Part of the policy sciences problem-oriented approach is understanding how different people define and experience the ordinary and constitutive policy problems (Laswell, 1971; Clark, 2002; Clark and Vernon, 2017). Ordinary problems are often technical in nature, dealing with knowledge or information used in the decision process (e.g., related to biology, ecology, or economics), whereas constitutive problems address the normative aspects of decision-making, including values, governance structures or processes, and people involved (Laswell, 1971; Clark and Vernon, 2017). Constitutive problems thus refer to who gets to decide what to decide, reflecting aspects of power dynamics, how decision-making is structured, what procedures are employed or ideologies espoused, and who is invited or excluded in the decision process (Nie, 2001; Robbins, 2012; Clark and Vernon, 2017). Often, the constitutive process is overlooked in policy-making, yet is crucial to securing the common interest for conservation success (Brunner and Clark, 1996; Clark and Vernon, 2017).

Our study is part of a larger project that builds on similar work that elucidates the social and institutional problems in policy-making, with recommendations that are useful for localized conservation policy problems and broadly applicable on a global scale (Vernon and Clark, 2015; Hughes, 2018). Part of the strength of this approach is learning first-hand from the people impacted by conservation policies, in order to develop action that will resonate with peoples' needs and that of wildlife (Chase et al., 2002; Berkes, 2004; Bixler, 2013; Nastran, 2015). It is our hope that in utilizing this approach we help illuminate how future policy design can espouse principles of participatory approaches in decision-making to ultimately more successfully address conservation problems (Chase et al., 2002; Berkes, 2004; Reed, 2008; Treves et al., 2009; Clark et al., 2014; Nastran, 2015; Lopez-Bao et al., 2017).

MATERIALS AND METHODS

Following the policy sciences approach, to first situate ourselves in the grizzly bear recovery policy context, we reviewed publicly available documentation (e.g., guidelines, scientific publications, online and print reports, and websites) on the listing of grizzly bears (Laswell, 1971; Clark, 2002). Document review is a common technique used to contextualize multiple sources of information and summarize decision-making processes that approximate intended policy goals and can provide insight into the power dynamics at play in policy contexts (Patton, 1990; Bowen, 2009; Clark and Vernon, 2017). The document review informed our understanding of the trends and conditions of grizzly bear recovery policy.

We then conducted semi-structured interviews across Alberta's BMAs to gather first-hand accounts, perspectives and experiences with grizzly bear recovery policy from the people who live, work and recreate in these areas (BMA; Laswell, 1971; Clark, 2002; Yin, 2014). We used a key informant list,

generated by the provincial governments' carnivore specialist, to develop an initial interview sample of government biologists, landowners (e.g., cattle ranchers, crop farmers), natural resource sector personnel (forestry, petroleum industry, mining), and environmental non-government organizations (ENGOS; Noy, 2008; Drury et al., 2011). Additional participants were identified via chain referral, which enabled us to collect first-hand interview data grounded in the participants' own words, from a diverse range of people across Alberta's BMAs (Biernacki and Waldorf, 1981; Noy, 2008; Goldman et al., 2010; Bixler, 2013; Vernon and Clark, 2015).

Participants were initially contacted via telephone or email and given the study information and consent documentation (University of Alberta, 2016). Once consent was granted, an interview date, time, and location for each participant was established. Face-to-face interviews were preferred, though telephone sessions were made available if there were constraints to meeting in-person (Novick, 2008). A semi-structured interview guide informed by similar studies was used, with latitude to explore topics more deeply as they emerged through the interview (Drury et al., 2011; Bennett, 2016). An iterative process of collection-transcription-analysis was used to determine corroboration and saturation of interview data, which included comparing and contrasting data to develop provisional descriptions of the problem perspectives (Patton, 1990; Clark et al., 2008; Rust and Taylor, 2016). Once data saturation was met, meaning no new patterns or themes emerged, data collection ceased (Fusch and Ness, 2015). Interview transcripts were reviewed again to identify any possible new problem descriptions, provisional codes were entered into NVivo 10 software, and redundancies or co-occurrences in coding were condensed and removed as necessary (Namey et al., 2006; Saldana, 2009; QSR International Pty Ltd, 2012). We also extracted key quotes to help illustrate findings (Young et al., 2015).

RESULTS

We first present the trends and conditions in grizzly bear recovery, including a condensed timeline of noteworthy events (Table 1). We then present the problem perspectives gathered from interview data.

Document Review: Policy Trends and Conditions

Alberta's grizzly bear populations once numbered in the thousands; however, the advent of European settlers seeking a new lifestyle encouraged by early government land use propaganda saw grizzly bear numbers widely fluctuate and eventually decline (Nagy and Gunson, 1990; Table 1). This decline has been attributed to agricultural expansion, fur trading, trophy hunting, poaching, timber harvest, and petroleum and mining developments, which over time has increased opportunities for human-bear conflict (including "problem bears" and indirect mortality sources) as well as habitat change, fragmentation, and loss. Grizzly bear conflict has also affected human wellbeing, by impeding industrial resource

TABLE 1 | Summary of the trends and conditions influencing grizzly bear recovery policy in Alberta.

1700–1800	Grizzly bears and Indigenous Peoples reported to co-exist Estimated 6000 grizzly bears in Alberta, based on assumptions of one bear per 1000 km ² 1870–1880: increased European settlement, particularly in southern Alberta
1900–2000	1927: First legal protection requires hunters to register legal kills 1928/1929: Designated as a fur-bearer followed by big game species. Rapid grizzly bear population decline due to unrestricted sport and commercial hunting by settlers 1950s: Public and government-sanctioned bear population control measures 1960s: More stringent hunting restrictions 1982: Fish and Wildlife Policy of Alberta states “Government is to ensure that wildlife populations are protected from severe decline and that viable populations are maintained.” Alberta Wildlife Act empowers the Endangered Species Conservation Committee (ESCC) to “identify species that may be formally designated as endangered or threatened.” 1988: Established draw systems and quotas for hunting 1990: Provincial Management Plan for Grizzly Bears released, with an estimated population of 790 individuals; goal to increase to 1000. Series of studies and reports indicate habitat requirements, road mortality and new management approaches are needed to protect bears
2000–2004	2002: ESCC recommends designation as “threatened” based on “very small population size (fewer than 1000) and dispersal and exchange with adjacent populations limited.” The Minister for Sustainable Development does not accept the ESCC recommendation but appoints a Grizzly Bear Recovery Team 2003: The maximum fines for grizzly bear poaching is increased to \$100,000 from \$5000 2004: Intensive DNA-based population estimates conducted throughout the province until 2008, providing the first reliable grizzly bear population estimate. Alberta BearSmart educational program manual publicly released
2005–2007	2005: Legal hunting allocated 73 licenses provincially, with 10 filled. Draft Grizzly Bear Recovery Plan developed 2006: Hunt suspended for three years to address human-caused mortality. Alberta hunters upset over framing of grizzly bear population decline as a hunting problem, and cite considerations for habitat loss, poaching, road kill, and other issues
2008–2012	Five-year Alberta Grizzly Bear Recovery Plan (2008–2013) approved 2010: Minister designates grizzly bears as “threatened” at recommendation of ESCC. ENGOs note this as a “symbolic act, recognizing the perilous plight of the province’s grizzlies and suggesting that recovery actions will now begin.” Hunting moratorium continues. Draft Access Management Strategy developed but not publicly released
2012–present	Recovery Plan is reviewed and renewal process is undertaken Hunting moratorium continues and remains a controversial subject 2016: Draft Access Management Strategy posted online, but not supported by legislation June 2016: Renewed Draft Recovery Plan posted for public comment. As of January 2020, the new plan has not been accepted by the Minister and no release date for the final plan has been announced.

Sources: Nagy and Gunson (1990); Nielsen (2005); Kolhi (2007); Alberta Sustainable Resource Development (2008); Festa-Bianchet (2010); Gailus (2010); Committee on the Status of Endangered Wildlife in Canada [COSEWIC] (2012); Alberta Wilderness Association (2014); and Alberta Environment and Parks (2016).

development, depredate livestock or damaging crops and property, and in rare cases, causing human injury or fatality (Alberta Environment and Parks, 2016).

Circa 2002, the provincial Endangered Species Conservation Committee recommended that the grizzly bear be listed as *Threatened* under Alberta’s Wildlife Act. This recommendation was not accepted by the Minister at the time, but a multi-stakeholder Grizzly Bear Recovery Team (i.e., government scientists, researchers, industry, landowners, Indigenous Peoples) was initiated by the Minister and was meant to reflect the diversity of values, knowledge and experiences with grizzly bears provincially. A hunting moratorium was established in 2006 as an interim measure to address human-caused grizzly bear mortality. During this time, the hunting ban was both applauded and contested by interest groups and the broader public. Circa 2008 the plan was submitted to the minister of Sustainable Resource Development [now Alberta Environment and Parks (AEP)], and after a lengthy decision process was approved with grizzly bears formally listed as provincially threatened in 2010.

Currently, Alberta’s grizzly bears are managed as a threatened species, with recovery objectives including population assessments to understand bear density and distribution,

reducing human-caused mortality through access (i.e., linear footprint) management, conflict mitigation and education, and cooperating in inter-jurisdictional management. The governance of grizzly bear recovery has been complex, with two different provincial government agencies responsible for different management objectives, AEP and Justice and Solicitor General (JSG). In the past, these agencies were housed under one government department, but with recent government elections and reorganizations they have been split into different units resulting in different reporting lines and hierarchies, as well as different normative perspectives and operational practices with regards to grizzly bear management. For instance, AEP includes wildlife and parks biologists with jurisdiction to monitor and manage bear population and habitat conservation, as well as delivery of educational outreach across provincially managed (i.e., Crown) lands. The jurisdiction and mandate of parks biologists’ is limited to designated protected areas, with a focus on ensuring ecological function and human safety. AEP staff, however, also includes public lands officers with authority to manage activities on provincially leased lands, which includes forestry operations, agriculture (e.g., cattle grazing reserves), municipal uses (e.g., gravel pits),

and recreational pursuits. Additionally, the separation of enforcement officers under a different department (JSG) adds to the management complexity. Enforcement officers have the authority to manage “problem bears” and public safety concerns, human-bear conflict (e.g., livestock depredation), translocating bears, bear euthanasia, and bear mortality investigations. Some officers also prioritize educational outreach efforts. Given the nature of this work, enforcement officers and biologists often liaise and coordinate management responses. However, the physical separation of the two departments combined with the complexity of different management mandates, authorities and perspectives on grizzly bear recovery, has the potential to create tension and conflict between government staff.

The federal government also has management authority, limited to Alberta’s national parks including Jasper, Banff and Waterton Lakes. Management objectives of federal biologists’ are to ensure a healthy grizzly bear population and secure habitat, manage public safety risks, and provide educational outreach to visitors within parks boundaries. Inter-jurisdictional cooperation exists between provincial and federal governments and is recognized as important to ensuring recovery objectives. However, challenges exist as to management authority when bears cross park boundaries into provincial or private lands.

Other players in this policy landscape include non-government sectors such as natural resources (e.g., forestry, petroleum and mining industries), agricultural production (e.g., livestock, crops), rural residential and recreational uses, and ENGOs. Natural resource extraction and production companies reportedly employ “BearSmart” best practices to mitigate conflicts and safety risks with grizzly bears, as well as reduce habitat impacts through access management practices. There is less standardization and more variation across agricultural, rural residential and recreational land uses given that they are conducted by private landowners or individuals who independently decide whether or not to adopt BearSmart principles and practices. This can include bear safety and use of bear spray, livestock carcass disposal, electric fencing, and securing human garbage from bears.

Lastly, ENGOs largely play an advocacy and educational role in Alberta’s grizzly bear recovery, including supporting policy change, implementing educational outreach, and in some cases assisting or leading on research activities (e.g., population inventory). Many of these organizations are located in the central (e.g., Edmonton’s CPAWS) and southwestern areas of Alberta, and notably in municipal districts in protected areas (e.g., Canmore’s WildSmart).

Interviews: Problem Perspectives

Sixty-seven interviews were conducted between 2012 and 2014. Interviews were conducted in-person ($n = 43$) and by phone ($n = 24$), and averaged 80 min in length. Participants included 58 males and 9 females with an average age of 51. We note the skew toward more males than females in our results limits our ability to make general inferences particularly of female perspectives. We note that our sampling strategy may have affected this (i.e., chain referral) as well as the generally lower number of females working

in the natural resources sector (Statistics Canada, 2019). That said our approach is consistent with other similar research utilizing qualitative methodology (e.g., Bogezi et al., 2019).

Participants were categorized according to a descriptor that best reflected their primary livelihood type, as this was how they most commonly experienced grizzly bears and recovery policy. This included government biologists and enforcement officers ($n = 30$), natural resource sector (i.e., agriculture, energy, mining, forestry, hunter, trapper, outfitter; $n = 32$), and environmental non-governmental organizations ($n = 5$). It is important to note that while some participants individually identified as an Indigenous person, they explicitly asked *not* to have their interview data identified as Indigenous given their concerns of under-representing the broader, varied, and culturally rich way of knowing grizzly bears, as well as actual experiences with recovery policy, from different Indigenous Peoples in Alberta. Therefore, we acknowledge the lack of a robust Indigenous perspective in our study, which certainly warrants future exploration (Clark and Slocombe, 2011; Bhattacharyya and Slocombe, 2017).

While we expected to find more variation in problem perspectives we in fact found commonalities across participants, in their assessment of both ordinary and constitutive problems in grizzly bear recovery. The ordinary problems articulated by participants included criticism of the lack of clarity in recovery policy, specifically in terms of the definition of “recovery,” goals, objectives, and processes, inefficient or inconsistent policy implementation including questions around the authority to manage bears, lack of funding, and lack of evaluation to determine success. However, while there was a broad, shared perspective on these problem, different participants emphasized different elements of these ordinary problems.

From a biological perspective, government staff were frustrated with the lack of policy clarity regarding legislative authority and guidelines to implement and ensure access (linear footprint) management. This included lack of legislative authority, regulatory compliance and enforcement. There was also frustration related to methodological inconsistencies and lack of financial investment in conducting bear population inventories across different bear management units, as well as prioritization for which BMAs were inventoried. This made communicating with the public difficult, and sparked debate on the effectiveness of scientific research and government biologists. From natural resource participants, the recovery term itself was unclear, with complaints for the lack of an explicit population or habitat target, and questions of “recovering bears to what” illustrating confusion around policy goals. One forester commented that grizzly bears “are the most visibly threatened species,” indicating skepticism in bear population research that has been conducted, and lack of accounting for local public knowledge (i.e., bear sightings, encounters) in developing policy targets, which also relates to the constitutive or decision-making problems. Natural resource participants, and also enforcement officers, indicated that they felt disregarded and disrespected in the policy process, which also is linked to constitutive problems. This included dismissal of their observations and experiences of increased bear sightings and bears moving east of formerly accepted range: “they are expanding their range

and there's more bears. They're increasing population and when we're counting bears you know sometimes the biological thing of counting bears, I know we don't count any bears in the Evansburg district, as a fringe population. So there are bears in other areas that aren't being counted." That said, biologists also indicated their frustrations in feeling disregarded for their scientific expertise and commented that the general public lacked understanding of scientific methods which they felt contributed to problems of the public perceiving the grizzly bear population was increasing/expanding.

Ordinary problems also reflected participants' criticism for recovery implementation, including perceptions of a cookie-cutter policy that did not address the different needs of bears or people across BMAs, with varied habitats, and human land uses and values. As suggested by one interviewee, "If you're a landowner, then you're going to be dealing with grizzly bears from maybe an economic perspective, certainly a safety perspective." This also included frustration for a lack of regulatory authority to implement access (i.e., linear footprint) management, and inefficiencies in the livestock depredation compensation program., with one rancher indicating "it takes too long to wait for compensation for a livestock kill. . . Let me just take care of business myself." Additionally, ranchers or farmers that did access the compensation program felt unfairly persecuted and blamed by government staff, which contributed to strained relationships. All participants identified that problems to recovery implementation included the constraints on government staff capacity, such as an increased workload, as well as funding cuts given changing political priorities. As suggested by one enforcement officer, "we need a lot more officers [. . .] there's just not enough of them around. The demands for the officers' time have increased, but the officer [numbers] just haven't." In turn this resulted in staff stress and burnout, and giving changing government structure and priorities, confusion among the public for grizzly bear recovery goals and management authority.

Alberta BearSmart, the banner program for public education, was also criticized as poorly funded and ill-coordinated. Educational initiatives were reduced to "side of desk" or "nice to do" by government participants given limited priority and funding from senior decision-makers. The program also lacked any form of evaluation to provide decision-makers with evidence of the effectiveness of educational outreach on achieving recovery objectives.

The constitutive policy problems in grizzly bear recovery reflected broader philosophical or normative differences between government staff, natural resources, and ENGO participants, including views on how bears should be managed (e.g., individual versus population-level, or problem bears), disputes in jurisdictional responsibility for bear management (e.g., public versus private versus park lands), the utility or practice of certain management actions (e.g., re- or trans-location, euthanasia, or aversive conditioning), and issues of trust. This also included perceptions that recovery planning catered to an urban and moralistic perspective on grizzly bears rather than accounting for the realities of risk that rural people faced living with a potentially dangerous large carnivore. As indicated by one rancher, "it's fine

for Calgary folks to say we want all these bears around, but if the bears were in Calgary the way they are out here, it wouldn't be fine for them anymore." Another rancher shared his perspective that "there's only 2% of the Alberta population that is rural agriculture now, and we have no political clout whatsoever. It's the urban folks that have it all, and they've got no idea about what's going on. They think farming is nice to do. But when I'm calving, I'm in it. There's no break. I need to grit and get the work done. It's cold, it's late or early, it's just work. And there are bears around, so it's dangerous walking out there at night." Conversely, ENGO participants felt marginalized as environmental radicals in the grizzly bear policy discourse.

Definitions of a "problem bear" was also problematic, given that natural resource participants felt their experiences and knowledge were not solicited by government in developing the formal definition and documentation (i.e., 2016 Grizzly Bear Response Guide). This contributed to a mismatch between agency and public expectations for what constitutes a problem bear, how a problem bear would be managed, and how that would serve people's needs. However, one government biologist felt that "people's emotions take over on animals, and it's a right for all of them to live. So, to a lot of people, destroying any animal is taboo. You're not going to win, there's always going to be a controversy in something like that." This perspective is also shared with ordinary problems insofar as the technical bear management considerations, including the costs associated with investing staff time to re/translocate bears, bear survival rates, and public desire or expectations for how bears should be managed (e.g., moved or euthanized). Notably, natural resource participants, and more specifically ranchers and farmers, indicated dissatisfaction for how problem bears were managed, and commented that the phrase "shoot, shovel, shut-up" symbolized that people can "take care of business" despite prohibitions on killing grizzly bears (Hughes and Nielsen, 2019). Participants also raised the topic of re-establishing grizzly bear trophy hunting as a potential way to manage problem bears and build social tolerance, particularly on private lands, with some preferring this option over others (e.g., ranchers versus biologists). However, this option was equally contested, recognizing the difficulties in implementing and scientifically monitoring a problem bear hunt effectively.

Issues of trust included a lack of public confidence in government, academic or other scientists' rationale for listing grizzly bears as threatened, thought to be motivated by funding priorities or personal values. Coincidentally, these participants indicated skepticism of scientific studies (i.e., population assessments). Contributing to mistrust and apprehension were public perceptions of inadequate consultation processes and transparent communications to the public by government. All participants also indicated to some degree there was a lack of willingness to implement recovery policy, whether from politicians to members of the general public. As suggested by one biologist: "if the Government of Alberta wanted to protect grizzly bears, [they] would protect grizzly bears in Alberta. The fact is, we have all the information, we have all of the tools, we have all of the resources. What we don't have is the willingness to do it." Government participants perceived a lack of willingness for natural resource participants, from

ranchers to farmers or forestry to petroleum industry personnel, to accept the costs of living with grizzly bears, including accepting limitations on industrial developments in order to protect bear habitat, or residents' voluntarily implementing attractant (i.e., garbage) management, and ranchers adopting conflict mitigation techniques (e.g., electric fencing, range riders). As one enforcement officer indicated, "people shoot grizzly bears and don't tolerate them, just the carnivore tolerance is a lot lower." Indeed, "tolerance to coexist" was a contested concept, defined differently by different participants. On one hand it meant ensuring human activities in grizzly bear habitat were sustainable for bears and mitigated public safety concerns. On the other hand, it meant keeping bears out of human-dominated spaces – a form of "not in my backyard."

DISCUSSION

We used the policy sciences problem-oriented approach to explore why grizzly bear recovery remains a complex and contested policy issue in Alberta (Laswell, 1971; Clark, 2002). Certainly, understanding the different problem perspectives people hold is important for policy design and implementation (Primm and Clark, 1996; Cromley, 2000; Wilson and Clark, 2007; Richie et al., 2012; Clark and Vernon, 2017). While we expected different problem perspectives to emerge, we instead found that participants generally shared key features in their perspectives. This included the ordinary, technical problems related to the lack of clarity in policy, inefficiencies in implementation, and inadequate commitments including financial, staffing and political. We also learned that these technical problems are exacerbated by constitutive problems, of which are related to decision-making and governance of recovery policy or who gets to decide what to decide (Laswell, 1971; Clark et al., 2014; Clark and Vernon, 2017). While in North America it is assumed policy decisions made by government agencies are legitimate, representative and transparent, meant to secure and sustain the common interest, this assumption is not necessarily true in Alberta, where ongoing controversy over grizzly bear recovery persists despite nearly a decade of policy implementation (Rutherford et al., 2009; Chamberlain et al., 2012; Gibeau, 2012; Bixler et al., 2015). Our study revealed that different participant groups have in some way felt delegitimized and unable to assert or actualize their perspectives and values in recovery policy processes. This is not unlike many other conflicts in conservation, whereby the ordinary or technical problems are exacerbated by constitutional ones – the power dynamics, mistrust, and feelings of disrespect (Robbins, 2012; Bixler et al., 2015; Nastran, 2015; Young et al., 2016; Clark and Vernon, 2017; Clark et al., 2017; Lopez-Bao et al., 2017). Though government routinely uses consultative processes and assumes that stakeholder perspectives are evenly accounted for, this approach can be inadequate and instead cater to interest group agendas (Nie, 2001; Bixler, 2013; Skogen, 2017). As such, these constitutive problems will persist, relative to whose interests are served, whose knowledge is valued and used, and what decisions are carried out (Clark et al., 2017). In this

case study, what participants want is a shift in policy design, from an institutionalized and technocratic approach that elicits information from elites, to a decentralized process that engages a broad range of people to share their knowledge, values, needs and preferred outcomes (Nie, 2001; Berkes, 2004; Bixler, 2013; Young et al., 2015; Mason et al., 2017). This is an important lesson for conservation practice globally, as even in our study the government participants indicated the policy problems partially lie in an outdated process that perpetuates a lack of trust between different interest groups, compounded by bureaucracy to implement recovery action.

The solution space for grizzly bear recovery, which we also suggest applies to other large carnivore policy processes, should consider enabling people a fair chance to assert their voice, to articulate their values and positions, and create a shared understanding of problems and possible solutions (Berkes, 2004; Adams and Sandbrook, 2013). This moves beyond traditional forms of consultation and espouses principles of participatory system improvements that recognize the diversity of participants, their knowledge and experiences, values and needs (Chase et al., 2002; Clark, 2002; Berkes, 2004; Adams and Sandbrook, 2013). In turn this can help policy-makers find leveraging points that bring people together for collective action (Adams and Sandbrook, 2013; Bixler, 2013). Adopting participatory policy processes can also help policy-making participants achieve other values, such as wellbeing, affection, and rectitude, through a decentralized, power-sharing model of decision-making (Treves et al., 2009; Young et al., 2016). This includes engagement from scientific experts, local knowledge keepers and others within the socio-cultural and political sphere (Raik et al., 2008; Treves et al., 2009). Specific to this study, participants indicated that future grizzly bear recovery policy should adopt a collaborative approach process to developing policy objectives that reflect the context and needs of people and bears. This includes clarifying and contextualizing recovery terminology and regulatory authority, securing long-term financial investments and political commitment for implementation, and evaluating and communicating recovery achievements. While we acknowledge that governments operate within established hierarchical decision-making structures that can be difficult to change, negotiating new spaces of cooperative knowledge exchange and decision-making can help balance otherwise asymmetrical power dynamics in conservation policy and create shared understandings (Raik et al., 2008; Ebbin, 2011; Robbins, 2012). That said, while we acknowledge that biological and ecological scientific evidence is considered a cornerstone of effective conservation policy, the role of local and Indigenous Peoples' knowledge, experiences and values, as well as recognition of their land uses and wildlife practices, is also necessary (Berkes, 2004; Clark et al., 2014; Polfus et al., 2016; Carroll et al., 2017). Future research could explore how to integrate both natural and social sciences data in policy processes (Polfus et al., 2016). However, participatory processes are not without their challenges, so care must be taken in their implementation, to avoid unintended conflict or exacerbate existing problems (Lopez-Bao et al., 2017). This includes careful

consideration for who is included in decision processes, with clear and explicit statements indicating peoples' interests or efforts taken to exclude self-interest, and the use of consensus-based approaches with effective third-party facilitators (Lopez-Bao et al., 2017). In hopes, these careful considerations may help to balance the power dynamics in policy decision-making processes and produce outcomes that work for people and wildlife (Patterson et al., 2003).

CONCLUSION

While government agencies around the world are mandated to conserve and manage large carnivores, the path that conservationists and managers take to achieve desired outcomes should consider adopting participatory approaches that seek to decentralize decision functions and share power, build trust, and foster respect for different opinions and experiences in policy design (Clark et al., 1996; Berkes, 2004; Pretty and Smith, 2004). This can help foster co-learning, identify capacity-building or technical needs, recruit local champions, encourage stewardship, and improve knowledge, comprehension, and participation in scientific processes (Chase et al., 2002; Pretty and Smith, 2004; Reed, 2008). In turn this can help ward off some of the ordinary, technical problems often evident in the implementation of conservation policies (Vernon and Clark, 2015). Participatory processes often hinge on bureaucratic support for decentralization and collaboration, and while this might be a significant challenge in Alberta or other traditional, hierarchical governments it is certainly worthy of pursuit and arguably necessary for conservation success (Berkes, 2004; Treves et al., 2009; Gibeau, 2012; Clark et al., 2014). Indeed, as Alberta's grizzly bear recovery suggests, conservation achievements ultimately rest on society's willingness to coexist with large carnivores (Alberta Sustainable Resource Development, 2008). Engaging all people in meaningful decision processes can help tip the scale toward success.

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DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

This study involved human research participants. Ethics approval was granted by the University of Alberta in accordance with the Research Ethics Board (REB). Participants gave their written consent to participate in this study.

AUTHOR CONTRIBUTIONS

CH designed the study, collected and analyzed the data for this manuscript, and was lead author. SN assisted in the data interpretation. NY, AM, and SN contributed to writing and revising the manuscript. All authors gave approval for publication of this manuscript.

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Conflict of Interest: AM is self-employed by Winisk Research and Consulting.

All authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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