The Importance and Influence of the Human Dimensions in Grizzly Bear (*Ursus arctos*) Conservation

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Conservation Biology

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University of Alberta

Abstract

Conservation practitioners increasingly recognize the importance and influence of the social context in conservation outcomes. From local stories to newsprint articles, the language we use, the stories we tell, and the interactions we have with wildlife species can influence human relationships with them. This is particularly true for carnivore species, including bears, which hold a special place in human imagination and lived experience. Throughout history and across their geographic range, different bear species have been portrayed and valued for their beauty, power, spiritual connection, ecological significance and kinship values. Bears have also been disliked and feared for their ferocity, and reviled for the negative economic impacts or safety risks they can inflict. These views and values undoubtedly influence peoples' proclivity to support or deny conservation action. This dissertation attempts to understand why human relationships with bears, specifically grizzly bears (*Ursus arctos*) have been constructed and what this means for their conservation.

Chapter1 is an introductory chapter presenting a broad overview of this thesis. I first discuss the rationale and framing for my research, specifically from a human dimensions of wildlife perspective. I also explain my motivations and positionality in this research. I then introduce my theoretical perspective, informed by social constructionism, wildlife value orientations, wildlife attitude typology, and qualitative methodology. I also provide an overview of the context of this study, broadly discussing grizzly (brown) bear status and conservation across their global range, and narrowing to Alberta, Canada and the province's recovery policy.

Chapter 2 presents a literature review of stories about bears, from myth and legend, folklore and traditional practices using available English-language literature, to help illustrate

how the stories we tell about bears play a role in shaping human proclivity to conservation action.

Chapter 3 examines newsprint media communications on grizzly bears across their western range in North America using content analysis to examine how messages are framed for grizzly bears and their conservation, and the relative attention given to these stories, to infer how this might influence a readerships' views on grizzly bears and their conservation.

Chapter 4 and Chapter 5 present results from mapping the social process and policy problems in Alberta's grizzly bear recovery, elicited from qualitative, semi-structured interviews conducted across bear management areas. This work helps to demonstrate that the human dimensions of bear or wildlife conservation go beyond assessments of peoples' attitudes by examining issues inherent in what makes conservation policy problematic.

Chapter 6 presents the conclusions of this research, including the applicability of this work in Alberta and at a broader scale, and considerations for future research. Results have both practical and theoretic application, locally and broadly, including the utility of qualitative inquiry in human dimensions of wildlife studies and in eliciting data for use in policy sciences analysis.

Keywords: qualitative research, grizzly bear, human dimensions of wildlife, policy sciences, media content analysis, Alberta.

Preface

This thesis is original work by Courtney Hughes. The research project, entitled "Trends in Grizzly Bear Conservation" of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board No. Pro00028845 August 7, 2012.

Sections from Chapter 1 have been published as a co-authored book chapter with Dr. N. Rust entitled "Social Science Methods" in "Cheetahs: Biology and Conservation", edited by Dr. L. Marker, L. Boast, and A. Schmidt-Kuntzel, and as a journal article entitled "Quantity does not always mean quality: the importance of qualitative social science in conservation research" (2017) in Society and Natural Resources with N.A., Rust, A. Abrams, D. W. S. Challender, G. Chapron, A. Ghoddousi, J. A. Glikman, C. H. Gowan, A. Rastogi, A. Said, A. Sutton, N. Taylor, A. Thomas, H. Unnikrishnan, A. D. Webber, G. Wordingham, and C. M. Hill.

Chapter 2 was co-authored with J.A. Glikman, B. Frank, N.A. Melnycky, P. and has been submitted to Society and Animals Journal.

Chapter 3 was co-authored by S.E. Nielsen and has been accepted to Society and Natural Resources Journal on.

Chapter 5 was co-authored by A.L. Foote, C. Hwang, J. Thorlakson, N. Yarmey, and S.E. Nielsen and is in preparation for submission to Human Dimensions of Wildlife Journal.

C. Hughes designed the studies, collected data, completed document reviews, and data analysis, and was the lead author on all chapters/manuscripts. Co-author contributions include advice and review on study designs, data collection, literature review, data analysis, and editorial assistance.

Acknowledgments

This dissertation would not have been possible without the love and support offrom my husband, family members, and dear friends. They have provided me with countless hours of attentive listening, advice, and encouragement. I also extend my sincerest appreciation to Dr. Scott Nielsen and Dr. Lee Foote, my advisor and committee member, for their patience, wisdom, and constructive feedback throughout this journey. I also thank Nate Webb and Gord Stenhouse for their ideas and advice through the formative stages of this work.

I would like to thank the University of Alberta, Government of Alberta, and Prairie Conservation and Endangered Species Committee for financial support and connecting my research to real-world conservation needs.

Lastly, I extend my sincerest gratitude to all study participants – without you, this work would not be possible.

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1 Introduction

The field of conservation biology has provided extensive biological information on wildlife and habitat of threatened species, yet it is increasingly recognized that the conservation problem is typically social in nature (Bennet et al. 2017; Dickman 2010). However, mainstream conservation science has historically been informed by biological or ecological sciences, notions of "fortress conservation", and the "Public Trust" doctrine (Brockington et al. 2006; Pooley et al. 2013; Soule 1985). Indeed, these perspectives have largely shaped North American conservation efforts (Peterson et al. 2017). However, this is largely a Euro-centric and western science approach to wildlife 'management', and while some may argue this has been beneficial for wildlife species or the public good, others like myself view this perspective as contributing to tensions in current conservation policy and action (Bennet et al. 2017). Aside from the perhaps overconfident view humans can effectively manage wildlife populations, there is often a lack of engaging people in conservation decision-making and the generation of what constitutes as 'science' (Bennet et al. 2017). Certainly, some people see wildlife as more than just animals to be hunted and consumed and view wild animals as having existence value or autonomous rights of their own (Abram 1997). Moreover, science can be a social endeavor. Therefore, all perspectives on wildlife and its conservation must be accounted for in decision-making. Conservation is both a human and bio/ecological endeavor, requiring exploration and investigation of people - their culture and social organization, political and economic influences – as they interact with the animals that share their world (Brechin et al. 2002; Treves and Karanth 2003). Increasingly, scholars are recognizing that conservation science is a value-laden and multi-disciplinary field that requires integration of all sciences and applied natural resource

management, as well as the engagement of local communities who live with wildlife (Bennet et al. 2017; Berkes 2004).

In undertaking this Ph.D. program and research, I was interested in using a social scientific approach to explore an applied problem in conservation - grizzly bear recovery in Alberta, Canada. This sub-field of conservation science is referred to as the human dimensions of wildlife (Decker et al. 2012). Research in the human dimensions of wildlife seeks to understand and examine human values, attitudes, knowledge, and behaviors within broader cultural, social, economic and political arenas as it relates to human-wildlife relationships as well as decision-making and governance of wildlife (Bennet et al. 2017; Dickman 2010; Gigliotti and Decker 1992; Rust 2015). Understanding the human dimensions of conservation is instrumental in identifying and addressing both the proximate causes and deeply-rooted conditions of conflict, especially conflict with large carnivores (Redpath et al. 2002; Tyrvainen et al. 2007). Studies on human-wildlife conflict commonly seek to identify the negative impacts of wildlife to people and how best to mitigate them (Redpath et al. 2002). However, this conflict has increasingly been recognized as a conflict about wildlife, specifically how to manage wildlife, who gets to decide, and who benefits or bears the costs (Hill 2015). The conflict, then, is more about problems and issues in governance and decision-making, and how this can affect peoples' livelihoods and wellbeing (Neumann 2005; Nie 2001; Redpath et al. 2002). To understand why conflict about wildlife occurs, the history, cultural beliefs and traditions, social interactions, normative values and institutional practices, economic context and political ideologies operating within a place must be understood (Bennet et al. 2017; Hill 2015; Ingold 1994). This explicitly recognizes that the conservation of wildlife is "overwhelmingly about the value transactions among people who have an interest or a stake in the issue" (Wallace et al. 2002, 99).

However, this is no small feat, to learn why people have come to value certain species and act towards them in certain ways, including support or opposition for conservation policy. Given my interests, my study aims to use a qualitative, social constructionist perspective integrated within the policy sciences framework to explore peoples' relationships with bears, and how this influences their views, values, and expectations for conservation. More specifically, my study focuses on grizzly bear (*Ursus arctos*) conservation across Alberta, Canada and the province's endangered species policy context. I wanted to explore how people come to view and value grizzly bears, if and how they were engaged in decision-making contexts, and how this might impact grizzly bear recovery policy.

1.1 Theoretical framework and methodology

I am a constructionist, and specifically a social constructionist. This position holds that there is no one single truth or reality, that knowledge and meaning are created through the language we use in social interactions and through our lived experiences, which I take to include interactions with wildlife species like grizzly bears and socio-political systems and processes, like government/policy (Gergen 2015). As social beings, humans construct meaning from their different experiences and share the beliefs, ideas, attitudes, and values they construct through the language they use and the behaviors they enact (Gergen 2015). In research, the aim is to elicit and understand both the meaning of a word, an object, a process, et cetera, and the perspectives, practices, and processes that help construct this meaning (Gergen 2015). With regards to wildlife species like grizzly bears, social constructionism suggests our interactions, whether simplistically framed as 'positive' or 'negative' holds more meaning than perhaps given credit (Scarce 1998). Human interactions with animals can come to represent a host of different meanings depending on the person or group perspective communicated (Scarce 1998). This can include social

institutions organized around political ideology, religious affiliation, land use type, or cultural background where these entities can influence both the narrative and representation of animals and informational flows (Scarce 1998).

For example, Scarce (1998) used social constructionism to help explain both human-wolf relations and perspectives on wolf reintroduction and management, where wolves were viewed as ecologically important by one social group, where another group saw wolves as a symbol of imposition and government control of rural freedoms and lifestyles (Scarce 1998). Similarly, wild dog conservation was recently examined from a social constructionist perspective by Fraser-Celin et al. (2018), who identified the dualistic nature of constructing a positive ecotourism image that competed against a problem animal image. These constructions are important to understand in terms of direct impacts on human lives as well as from a decision-making perspective, where narratives about human values for or conflict about wildlife can signal where this decision authority lies (Hill 2015). This has been demonstrated in human-tiger relations, where tiger representations are argued to be associated with issues of local land user displacement and inequalities in economic benefit streams, which are more broadly reflective of power dynamics in local and international governance (Jalais 2010).

To understand why human-grizzly bear interactions and values appear to range from love to hate, like to dislike, protect to kill, a social constructionist approach is an appropriate theoretic lens. Certainly, Greenough (2003) suggests the language we use and interactions we have with animals, within the context of other socio-political and economic processes, affect representations of what animals mean to us. However, it is important to note there appears to be a penchant for focusing on quantitative methods in human dimensions studies, rather than

eliciting rich description through qualitative inquiry (Drury et al. 2011; Marchini and Macdonald 2012).

Conservation biologists, often because of their epistemological orientation and schooling, default to quantitative methodologies even in human dimensions research (Bennet et al. 2017; Drury et al. 2011). While a standardized questionnaire conducted amongst a statistically-representative sample of a target population can adequately test *a priori* hypotheses, it would have limited utility in contextualizing why phenomena occur and why this is important to conservation. Qualitative methods are often more appropriate to elicit and articulate detailed viewpoints and lived experiences from people who live with wildlife, or as in this case, grizzly bears. Qualitative information can be beneficial to developing conservation policy, as well as be used to develop quantitative instruments (Bennet et al. 2017). Certainly, qualitative social science can assist conservation practitioners in understanding complex human-carnivore conflicts and work to improve coexistence (Manfredo and Dayer 2004). Examples of existing research employing qualitative methods include: exploring the social effects of cheetah conflict and conservation (Rust and Taylor 2016); using story-telling to examine the role of conservation education (Hughes 2013); understanding perspectives in human-carnivore interactions (Young et al. 2013); incentives to poach wildlife (Ghoddousi et al. 2017); local resistance to conservation interventions (Rastogi et al. 2012); or social process mapping and identification of policy problems in carnivore conservation (Clark and Slocombe 2011; Richie et al. 2012).

Choosing an appropriate methodological framework is therefore essential to ensuring a study's results are robust (Rust and Hughes 2017). While quantitative approaches are appropriate to test hypothesis-driven questions, typically utilizing larger sample sizes and statistical analyses to draw generalizable conclusions, qualitative methods are best suited to exploring a topic in

greater detail (Guba and Lincoln 1982; Newing et al. 2010). The focus on depth over breadth does not mean results are less robust, but rather that qualitative research strives for credible descriptions of contextually-specific social phenomena arising from data (e.g., participant interviews; Ritchie et al. 2003). Although constraints exist with regards to generalizability, the concepts and theoretical insights gained from qualitative studies can be applicable and examined elsewhere (Rust et al. 2017). The aim then is not to extrapolate findings to wider populations but to explore complex phenomena from the lived experience of participants and uncover something new (Rust et al. 2017). Often, non-random sampling methods are used, including chain referral, to elicit participation from people directly involved in conservation issues (Karanth et al. 2008; Noy 2008).

My study used an exploratory approach to examine the human dimensions of bear conservation, with attention to Alberta, Canada's grizzly bear recovery. Qualitative semi-structured interviews were used to collect detailed, firsthand data from a diverse array of participants across Alberta Bear Management Areas (BMA) to articulate the policy issues in grizzly bear recovery. Laswell's (1971) policy science framework was used to analyze data and articulate the social process in this contentious policy context and to identify common policy problems, as well as propose solutions (Clark 2002; Clark and Solcombe 2011; Richie et al. 2012). I integrated into my analysis concepts from cultural inquiry (Hall et al. 2012), wildlife value orientations (WVO; Manfredo and Teel 2004), and Kellert's (1994) attitude typology and political ecology (Neumann 2005; Robbins 2012).

Laswell's (1971) policy science framework offers a particularly useful approach to mapping the social process of conservation conflicts, as well as clarifying policy problems and articulating decision-making and future solutions (Clark 2002). This framework has been applied

to conservation policy processes with regards to carnivores and other wildlife species (Clark and Slocombe 2011; Rutherford et al. 2009), and in habitat conservation (Clark et al. 2009). This approach may be especially helpful in addressing conservation conflicts, as it explicitly involves local people at individual, stakeholder or community levels in collaborative conversations and decision-making (Clark et al. 2005; Hill 2015). Using this approach, the socio-cultural context of conservation can be more accurately described, including peoples' perspectives, interests, and expectations (Edwards and Gibeau 2013). Moreover, this approach can be useful in designing locally relevant conservation interventions and encouraging action (Pellikka and Sandstrom 2011); enhancing or fostering positive attitudes towards carnivore species (Kellert et al. 1996); and, creating space to build relations of trust and reciprocity between different groups (Redpath et al. 2002).

However, given the complexity in understanding the relationship between human values, knowledge, experience, attitudes, and behaviors towards carnivore conservation, it is prudent to integrate other theoretical insights into the policy science framework for explanatory purposes. As such, I include concepts and theoretical insights from the cognitive hierarchy model, political ecology and media content analysis (Fulton et al. 1996; Madden and McQuinn 2014; McFarlane et al. 2007; Nie 2001; Robbins 2012).

The cognitive hierarchy has been widely used in human dimensions research, to examine and explain peoples' wildlife value orientations, attitudes and knowledge with results informing policy design and implementation (Kellert 1994; Manfredo and Teel 2004; McFarlane et al. 2007). In my understanding of this model, the cultural context influences the types of experiences, knowledge, beliefs, and traditions a person constructs regarding bears (Ingold 1994). Experience and knowledge are interactive and co-produced across different places over

time (Davenport and Anderson 2005). Together, these interact to influence the values and attitudes a person has for bears and play a role in the behaviors people choose to enact (Fulton et al. 1996). While 'place' is not explicitly identified in this mode, I take 'place' as an important variable as it influences a people's culture through interaction with the natural or human-built environment (Carter et al. 2007).

Theoretically then, I assume that the cognitive hierarchy model represents the operation of knowledge, belief or attitude construction via experience and integration with bears, within a particular geographically-bounded place, giving rise to behavioral outcomes. My study utilizes the cognitive hierarchy to help examine the influences of the culture, lived experiences and knowledge construction, between people-grizzly bear relations and with recovery policy (Ingold 1994). In turn, I hope to explain how these variables might influence people's views and values for grizzly bears and their perspectives and expectations for conservation action.

Insights from the field of political ecology are also drawn upon in this study, for explanatory utility. Political ecology examines the influence of power, social relations and livelihoods in a conservation or management context (Robbins 2012). Political ecology can be useful in explaining how wildlife is used, otherwise valued or not, and how historic or current conservation doctrine might influence practices used (Nie 2001; Robbins 2012). In particular, the 'conservation and control' narrative suggests that struggles over resource ownership, between land users and state or national authorities, can inaccurately characterize local practices as unsustainable or detrimental (Robbins 2012).

Mixed methods are also common in studies of human dimensions, combining both qualitative and quantitative techniques in different formats to collect and analyze data, yielding both internal and external validity by combining statistics with narrative description (Creswell

2007; Rust and Hughes 2017). Mixed approaches are common in media content analysis, where forms of social discourse (e.g., newspapers) can be analyzed both quantitatively and/or qualitatively for explicit or latent meaning and in turn, the potential influence on individuals or society (Franzosi 2007; Krippendorf 2004; McCombs 2014; Price et al. 1997; Sakurai et al. 2013). Media content analysis is a technique that systematically characterizes the meanings in a given body of text to understand how messages are framed, and the attention given to certain stories over time (Krippendorf 2004; McCombs 2014).

Examples in conservation include the news media coverage on a Zimbabwe lion's death, which may encourage action against lion poaching (MacDonald et al. 2016); improving public awareness and understanding of risks to carnivores and their conservation through newsprint media (Jacobsen et al. 2011); and, coverage of a public debate on the ethics of bear management (Foote and Nielsen 2017). Other research has examined the role of news media in polarizing discourse around human-wildlife relationships, the function of media in perpetuating or dispelling myths about wildlife, and encouraging biologists and researchers to proactively collaborate with journalists in order to communicate accurate messaging in conservation (Alexander and Michael 2012; Barua 2010; Jacobsen et al. 2011; Kacznesky et al. 2008; Knight 2008).

In my study, I used media content analysis to investigate how different sources of newsprint media framed grizzly bear conservation across their western North American range, between 2006 and 2016, with a focus on Alberta and British Columbia.

Taken together, my research enables a more fulsome description of the seemingly contested grizzly bear conservation issue. While results primarily focus on an Albertan context, they can be more broadly applied elsewhere, for their utility in understanding and addressing

debated conservation policy issues. Moreover, my research adds to the human dimensions of wildlife field, helping to elucidate contested conservation problems, and pointing to the need for social science experts in conservation (Bennet et al. 2017; Redpath et al. 2002).

1.2 Study context: Grizzly bears (*Ursus arctos*) and their conservation

Currently grizzly bears (*Ursus arctos*) range across North America, Europe, and Asia, with the largest populations in Russia, the United States (Alaska), and Canada (British Columbia) (McLellan et al. 2017). Prior to European colonization of western North America, grizzly bear numbers were estimated in the thousands and while the species is considered relatively secure and abundant across their global distribution, populations are fragmented and threatened elsewhere with habitat loss and human-caused mortality affecting their survival (Fig. 1-1; McLellan et al. 2017). However, with increasing European colonization and immigration of a cattle ranching culture from the United States, grizzly bears and people increasingly competed for the same habitat use (COSEWIC 2012; Hedges 1939). What largely resulted was Euro-North American persecution of grizzly bears as pest animals or threats to safety and livelihoods (COSEWIC 2012).

While legal hunting is allowed in certain parts of North American grizzly bear range, these bears continue to be killed despite legislative protections and conservation policies, including poaching, indiscriminate killing as "pests", or agency control (Alberta Environment and Parks 2016; Clark 2007; McLellan et al. 2017; Nielsen 2005). Additionally, grizzly bears may be accidentally killed via vehicle collisions or mistaken as another animal (Alberta Environment and Parks 2016; McLellan et al. 2017). In addition to direct mortality sources, expanding human land use like agricultural developments, petroleum production and forestry extraction, road construction, and residential or recreational developments also effect bear

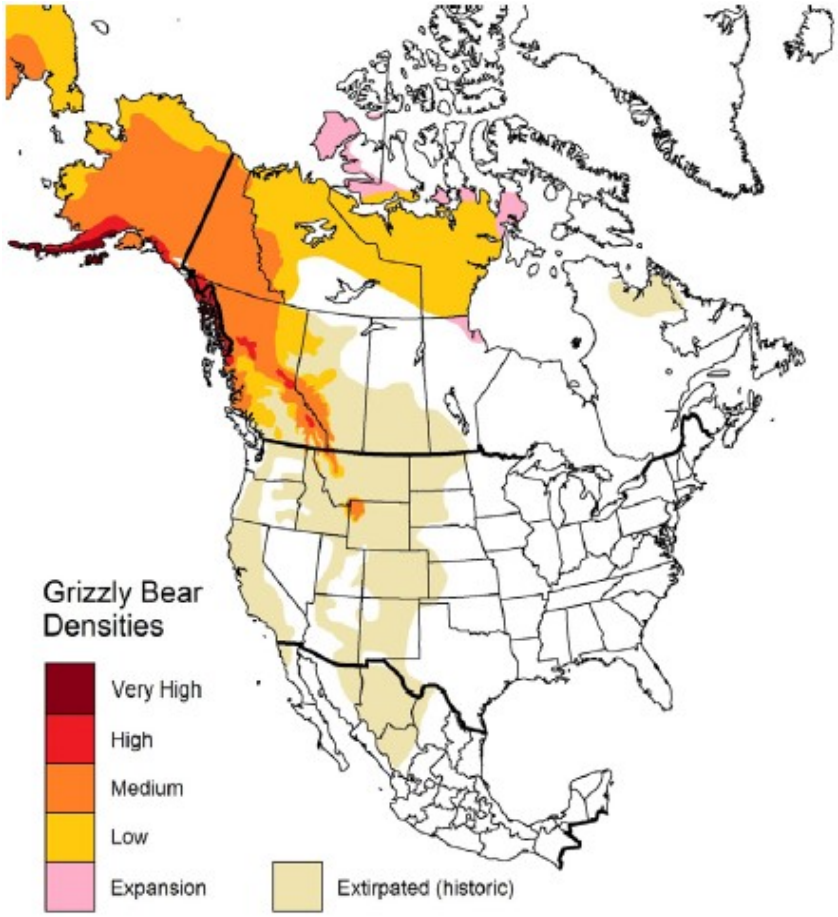

Figure 1-1 North America distribution of grizzly (brown) bears in the 19th Century (Canadian Wildlife Service 2012).

survival, particularly in Alberta, Canada (Alberta Environment and Sustainable Resource Development 2008; McLellan et al. 2017; Nielsen et al. 2006; Proctor et al. 2005, 2012; Waller and Servheen 2005).

Prior to European settlement (pre-1800), grizzly bears were considered abundant in Alberta, however, increasing immigration and land use change, and exploitative and indiscriminate killing, bear populations declined, and range contracted (Nagy and Gunson 1990). As a result, Alberta's grizzly bears came under provincial protection in 1927 (Nagy and Gunson 1990). However, bear livestock depredation, also coined human-bear conflict, was reported to be

increasing, leading the government to permit an open season on bears to manage conflict (Nagy and Gunson 1990). Subsequently, from 1938 to the late 1940s, grizzly bears were once again killed as a control mechanism against livestock depredation and human safety risk (Nagy and Gunson 1990). However, in the 1950s bear populations dramatically declined due to indiscriminate killing by ranchers and hunters, and from lax government enforcement (Kansas 2002; Nagy and Gunson 1990). As a result, the government introduced stringent protection of grizzly bears in the 1960s through to the 1990s including legal harvest limits (Government of Alberta 2014; Nagy and Gunson 1990). Still, the discretionary killing of bears by ranchers could be done in self-defense or to protect property (Nagy and Gunson 1990).

This rollercoaster of protecting to killing grizzly bears resulted in wide variability in populations across Alberta lasting decades (Kansas 2002). By 2002 a management plan was designed to set objectives to increase the estimated 790 bears across provincial and federal lands to 1000 individuals, first by addressing human-caused mortality from uncontrolled access and land use, notably agricultural expansion, and by regulating harvest and reducing human-bear conflict (Kansas 2002). At this time there was also increased concern expressed by conservationists of Alberta's grizzly bears being an at-risk population (Government of Alberta 2010). This ongoing scrutiny formed part of the impetus to list grizzly bears as a threatened species in the province (Government of Alberta 2009).

As part of the listing process, the Alberta Endangered Species Conservation Committee was assembled to develop a five-year recovery plan (hereafter, 'policy'; Government of Alberta 2009). A draft policy was completed in 2005, followed by an immediate hunting moratorium in 2006, with the final recovery policy accepted by the Minister of Sustainable Resource Development in 2008 (Government of Alberta 2010). After two years of bureaucratic

deliberation, grizzly bears were officially listed in 2010 as threatened under Alberta's *Wildlife Act* and the 2008 recovery policy retroactively adopted (Environment and Sustainable Resource Development 2013).

A key recommendation that has transcended the timespan of the threatened listing and the recovery policy has been reducing human-caused mortality, with emphasis on controlling human activities and access into bear habitat and conflict mitigation (Alberta Environment and Sustainable Resource Development 2008). Additionally, maintaining the hunting moratorium, identification of seven demographically separate bear population units, DNA-based population assessments, operational guidance for access and attractant management, development of the Alberta BearSmart education program, and inter-jurisdictional cooperation formed the remaining recovery objectives (Fig. 1-2; Alberta Environment and Sustainable Resource Development 2008).

Despite these efforts, human-caused mortality remains one of the greatest threats to the long-term sustainability of Alberta's grizzly bears (Alberta Environment and Sustainable Resource Development 2008). Though recovery policy indicates people are central to achieving a long-term, sustainable grizzly bear population, conservation managers still lack comprehensive understanding about the people expected to coexist with these bears (Nate Webb, personal communications 2011). While some people view bears as an iconic and charismatic species, others fear or loathe bears for the potential to inflict negative impacts on their livelihoods and wellbeing (MacFarlane et al. 2007). As a result, some people might oblige recovery policy direction while others may not and kill bears despite protections (Pohja-Mykra 2016). Certainly, the people expected to adopt policy action are likely to have a greater impact on the survival of grizzly bears and so conservation managers must better

Figure 1-2 Alberta's Bear Management Areas (Alberta Environment and Parks 2016)

understand why and how people come to view and value grizzly bears, and what this means for their long-term conservation.

Using an exploratory and primarily qualitative design, I sought to understand people's relationships with grizzly bears, their views and values, with a specific focus on people that live, work or recreate across the seven Bear Management Areas (BMA) in Alberta, Canada. I wanted to cast the net wide, to include people that worked in various sectors (government, industry, agriculture, non-profit), recreationalist and residents, as it was my assumption these more rural-dwelling people were under-represented in the existing research on human-grizzly bear co-existence in Alberta. Moreover, I wanted to understand why this animal seems to be so

controversial and why recovery policy apparently remained problematic for people – why recovery was not yet achieved despite the solutions being known (Gibeau 2012; Nate Webb, personal communications 2011).

In addition, I was interested in exploring the role of North American newsprint media in framing messages relayed to the public about grizzly bears and their conservation, including the relative attention given to certain topics, and how these messages might influence public perception.

1.3 Researcher positionality

As part of qualitative research and the policy sciences framework, clarifying my role as a researcher, including my assumptions about how knowledge is produced, positionality, and potential effects on study participants or outcomes, is both necessary and helpful to understand one's rationale for pursuing research and the power dynamics in academic researching (Berger 2015; Brinkmann 2007; Clark 2002; Laswell 1971). In many cases, academics or practitioners involved in wildlife conservation become involved because they care, are interested in, or identify some need that holds their attention. One's position, therefore, consists of values and biases derived from personal history and experiences, education, organizational affiliation and/or professional identification (Berger 2015; Clark and Willard 2000).

My rationale for this study was to advance my knowledge and expertise in the field of human dimensions of wildlife management by understanding how people construct their relationships with wild animals, specifically large carnivores, and what this means for species conservation or human wellbeing. This interest started when I was a Master's student in Environmental Education studying the influence of conservation education programs on children's cheetah perspectives and possible impact on understanding cheetah conservation, and

to some degree influenced by my Natural Sciences background (Hughes 2007). I also had month-long educational experiences in Tanzania and Botswana participating in an applied field school through the University of Alberta, where we explored ecological and sociological dimensions of wildlife conservation in developing nations. These further peaked my interests in why human-wildlife conflict persisted despite known solutions. Admittedly, though I was approaching these interests more so from a biological and technical perspective, given my schooling and experiences.

I became interested in the case Alberta's grizzly bears specifically given the seemingly complex values people held for this animal and given my work experience with the Government of Alberta in the Educational Outreach section. I was interested in understanding the decision-making processes of policy development, where educational outreach might fit in achieving carnivore conservation outcomes, and why we seemed to have ongoing human-caused bear mortality when solutions to curb conflict existed. Through conversations with the Government of Alberta's then carnivore specialist Nate Webb, he identified that the human dimensions of social tolerance of grizzly bear recovery were a priority research area.

Throughout my Ph.D. research, I remained employed by the Government of Alberta in the Education and Outreach unit, working on different projects (e.g., climate change, stewardship principles) and in doing so, learning about government organizational structure and the complexities in decision-making, whether positive or negative. However, despite these learning opportunities, there were a great many stressful and difficult days trying to 'balance' PhD-related work (e.g., writing) with my government work. The work involved for each of these areas used different skills and different ways of thinking (at the time, anyway), and I found I needed to carve out big chunks of time to dig back into the academic work despite maintaining a high

reading level of academic literature. This experience invariably influenced my positionality, as I swayed between academic and technical work worlds. It should be noted, however, that throughout my study university ethics procedures were followed prior to and during data collection and in analysis and reporting, ensuring research participants were aware of my both employment and researcher role (Appendix A). Throughout the entirety of my study, I endeavored to be objective and unbiased in my data collection, analysis, and interpretation.

As an early result of my research, I was invited to assist in reviewing and revising the 2008 Alberta Grizzly Bear Recovery Plan, to address problems identified through my study and elsewhere. While not all of my recommendations were included, the draft version of the revised policy was shared publicly for input via government consultation processes. To date, the 2008 recovery plan is still in effect as the revised version has not yet been approved.

2 From worship to subjugation:
Understanding stories about bears for their conservation

2.1 Introduction

The relationship between people and large carnivores is complex, ranging from reverence to vilification and from conflict to coexistence (Hill 2015; Madden 2004; Redpath et al. 2013; Sanderson et al. 2002). While much of the human dimensions research has focused on identifying attitudes towards wildlife, increasing attention is given to understanding the role of culture in conservation (Camino et al. 2016; Dickman 2010; Fraser-Celin et al. 2018; Kaczensky et al. 2004; Manfredo and Dayer 2004; Waylen et al. 2009). This includes understanding the construction of beliefs, knowledge, attitudes, and behaviours towards wild animals, and what this means for conservation action (Camino et al. 2016; Fraser-Celin et al. 2018; Infield et al. 2018). As Schneider (2018b) suggests, "the roles of culture in conservation, the impacts of conservation on culture and, indeed, the cultures of conservation and their proponents are complex, interrelated and evolving" (417). Certainly, understanding cultural values for human-animal relations is a necessary piece of the conservation puzzle, to help address conflict and coexistence between people and wildlife (Infield et al. 2018; Madden 2004). We suggest that examining the stories people tell about the wild animals that share their world can be a useful approach to understanding what animals mean to people and in turn, what this might mean for conservation action.

Stories or the folklore, myths, and tales people tell are one way people have historically used to make sense of their world, to construct meaning out of different experiences, to organize knowledge, to share beliefs and values, and instil normative behaviours or practices (Bronner 2007; Ceriaco 2012; Hill and Webber 2010; Jones 1994; Zemmelman 2012). Stories tell of two

things – our experiences based on interactions with bears, and the understanding and meaning we derive from those experiences (Galafassi et al. 2018). By examining the stories people tell about their relations with animal conservation practitioners might gain insight into the role animals play in people's lives and what this might mean for conservation policy and action (Infield et al. 2018; Riley 2010). For example, stories can identify how different people conceptualize 'coexistence' with wild animals and demonstrate that coexistence is possible even if animals have the potential to inflict negative livelihood impacts (Hill 2015). This is demonstrated in villagers' taboos against harming macaques (*Macaca tonkeana*) in Lore Lindu National Park, Sulawesi, Indonesia, and in turn has been used to spark conservation action (Riley 2010). Similarly, understanding values for Pemba, Tanzania's flying fox (*Pteropus voeltzkowi*) through the stories people tell has enabled collective action against habitat disturbance and hunting (Infield et al. 2018).

Stories about animals can also demonstrate how values for a particular species can traverse from reverence to vilification (Roe 1998). Folklore about hyenas (*Crocuta crocuta*) across Tanzania or the Ethiopian Highlands position these animals as supernatural beings, associated with witches or whom can inflict harm (Baynes-Rock 2015; Dunham 2006). However, in Tanzania hyenas are persecuted to reduce the chance of causing harm to people whereas in Ethiopia hyena are avoided to not invite harm (Baynes-Rock 2015; Dunham 2006). These differences serve important insights into possible reactions to conservation policy. Similar examples can be found in the stories people tell about the importance of lions (*Panthera leo*) to different cultural groups. In Kenya or Tanzania, lions symbolize power, prestige and are ritually killed, whereas in other countries lions are associated with witchcraft and killed to prevent negative outcomes (Dickman et al. 2015).

Stories about jaguars (*Panthera onca*) also reflect polarization in values. Central or South American Indigenous peoples' stories about jaguars reflect the belief in a common ancestor, and worship and respect for their physical and spiritual power and intelligence, with effigies, pelts and body parts used in ceremony and costume (Roe 1998). On the other hand, Euro-centric writing told stories of bloodthirsty and savage man-eaters, inciting fear and intrigue (Wilcox 2017). Today, jaguar stories often reflect human-jaguar conflict, with narratives describing socio-economic impacts and safety risks that jaguars pose, as well as the indiscriminate persecution of these cats, and their symbolic representation of tensions in land governance and conservation action (Carvalho and Pezzuti 2010; Fort et al. 2018; Zimmerman et al. 2005).

By examining the stories people tell about animals, areas of consensus and consternation regarding, such as contrasting viewpoints between different groups of people like conservationists and villagers, can be identified and importantly better understood (Schneider 2018). Additionally, examining stories about human-animal relations can help conservationists avoid unintended consequences, like creating socio-political tensions, inequality, or conflict (Chua 2018; Hill 2015; Hill, Weber, and Priston 2017). For example, in some areas of Peru Andean condors (*Vultur gryphus*) symbolize national identity and pride, yet festive practices using these birds can cause fatal injury and as a result, contribute to population concern (Dickman et al. 2015; Tegel 2011). Rather than using legal action to outright stop this practice, conservationists are collaborating with local communities to seek ways to change how condors are used (Dickman et al. 2015). Examining the stories people tell about condors has helped conservationists consider how to work within cultural institutions to garner support rather than generate opposition to conservation action (Bowen-Jones and Entwistle 2002; Dickman et al.

2015). Certainly, gaining perspective and insight from the people expected to adopt and enact conservation policy is vital to the success of conservation programs.

With this in mind, we reviewed stories about different bear species across space and time. We chose bears as they are a charismatic species that invoke a range of emotion and behavioural responses. Our review describes: (1) the different meanings and representations of bears and human-bear relations found within story; (2) why local stories about bears should be considered when developing conservation policy and action; and, (3) the need for cross-disciplinary collaboration that explicitly considers culture in conservation (Hall et al. 2012; Head et al. 2005; Waylen et al. 2009).

2.2 Methods

We used an emergent and thematic approach to review the English-language literature about different bear species, focusing on accounts of stories, myths, ceremony or practices as well as research articles identifying human-bear relationships (Gergen 2015).) We used keywords (e.g., bear, folklore, myth, ceremony, taboo) in searchable databases (ISI Web of Science, Google Scholar) available through the University of Alberta library and the Internet to collect the literature for review, filtering out irrelevant articles or stories (Fig. 2-1; IUCN Red List 2018; Treves et al. 2006).

To the best of our knowledge, this literature represents the most relevant content for the purpose and scope of our review, though acknowledge other literary or scholarly works in other languages may also prove insightful. Limitations of this review, therefore, include the inability to translate non-English literature given time and budget constraints, as well as concern over losing contextually important nuances if we were to use translation services (e.g., Google translate). We also acknowledge that hard-copy literature may have been missed, given our limited access to

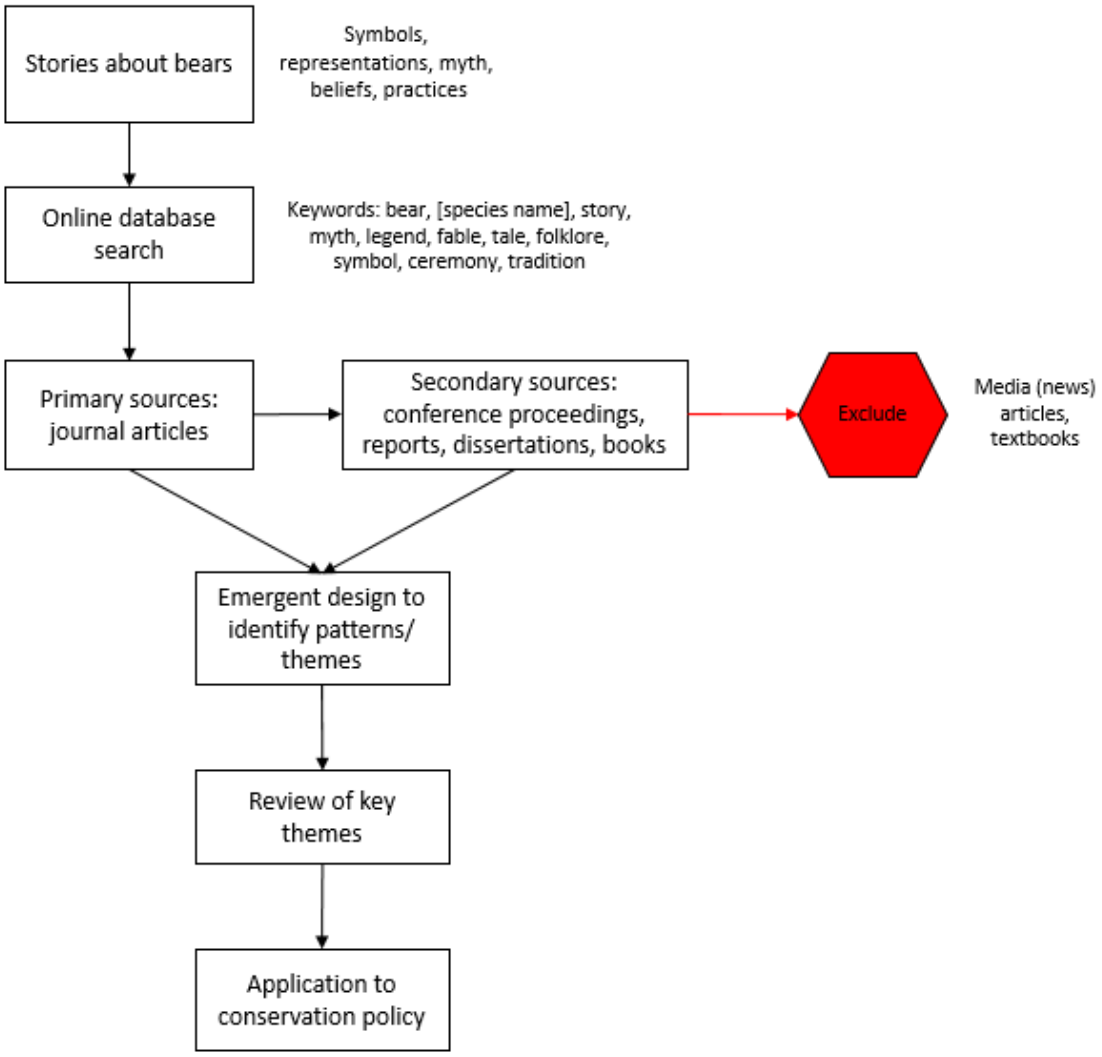

Figure 2-1 Method of literature review

these resources, and that there may be other culturally significant interpretations of the stories we tell about bears that may differ from our own.

2.3 Results

We identified six broad themes through an emergent review process, and though presented as discrete thematic streams to better understand our interpretation, do acknowledge the shared, blurry boundaries between these themes.

2.3.1 Ceremonialism

Hallowell's (1926) foundational work across Circumpolar Indigenous Peoples, to European and Asian cultures' myths similarly describe origins and common ancestry, deity worship and respect, and transformation, rebirth, and immortality (Benson 2004; Berres et al. 2004; Brunner 2007; Ingold 1994; Lumsden 1998; Pastoureau 2011; Petrov 1989; Rockwell 2003). This includes respect for the life and death of a bear, giving offerings and sacrament to the animal as a divine being (Germonpre 2007; Marler and Haarmann 2007).

For example, the Ainu's ceremonial killing of wild-caught, hand-reared bear cubs represented a sacrificial offering to the gods, with consumption of bear meat invoking power and protection against evil (Frazer 1922; Munro 1963). The Gilyaks and Goldi of Siberia participated in similar rituals as tribute and imbuement of courage (Frazer 1922). Bear ceremonialism also included taboos that denoted respect, as observed by the Pueblo or Yavapi Bear Clans who viewed bears as kin and did not permit killing or consuming the animals (Brunner 2007; Hallowell 1926). In Macedonia, bears were forest or mountain kings, with storytelling evoking respect and fear (Lescureux and Linnell 2010). Across Siberia, some tribes viewed bears as kin or transformed humans, and worshipped them for their strength and bravery (Dyrenkova 1930). In Mesoamerica, bear cults worshipped Andean bears (*Tremarctos ornatus*) as symbols of fertility, for people or agricultural production, and were both revered and detested for their sexuality (Paisely and Saunders 2010). Japan's Asiatic black bear (*Ursus thibetanus*) are viewed by some as a mountain deity and others as a demonic spirit, with traditions varying from reverence to hunting bears (Knight 2008).

Star lore about *Ursa Major*, as with Canadian and Asian Indigenous peoples, also tell us about human-bear relations and perhaps more importantly, how people made sense of natural

phenomenon with bears as symbolic representations (Dempsey 2008; Goff 2004). Dempsey (2007) suggests Indigenous Canadian lore reflects connections between cultural hunting practices and explanation or seasonal change; "the blood causes the leaves of the maple to turn red and eventually fall from the trees, and the bears' white fat eventually covers the land as snow" (60). Other variations signify human transformation into the spiritual world, or as with some Asian tribal cultures reflective of descent from the heavens to earth (Dempsey 2007; Gibbon 1964). While some scholars suggest Greek myths about *Ursa Major* are merely a mistranslation of the word 'arktos' and perhaps simply identify the northerly location of the constellation, others lore links *Ursa Major* to Callisto's story of transformation into a bear, a story of love, death, and change (Blomberg *n.d.*). More recently, Hughes (1990) suggests that the story about Artemis reflects animal protectionism and conservation values.

Lastly, bear ceremonialism also reflected the use of effigies, such as bear coins found in ancient Roman infant burials, suggested to represent guardianship or resurrection, or Indigenous peoples' use of claws in necklaces, to imbue its wearer with courage and strength (Crummy 2010; Matheson 1942; Pavlik 1997).

2.3.2 Kinship

Stories also told of morphological similarities, reflecting a common ancestry or anthropomorphization of bears. This included referencing the plantigrade gait, omnivorous diet, gestation period, maternal care, intelligence, inquisitiveness, unpredictable behavior, and individualism of bears (Berres et al. 2004; Gade 2016; Hallowell 1926). Different tribes across Circumpolar areas and Pre-Colombian Andes Indigenous People named themselves as a Bear Clan, reflecting the interconnection between ceremonialism and kinship, and reverence and ritual to honour the bear (Berres et al. 2004; Gade 2016; Hallowell 1926). Linked to this were beliefs

of human-bear pairings resulting in semi-ursine offspring, of whom might establish royal bloodlines or become formidable warriors (Brunner 2007; Pastoureau 2011; Shepard and Sanders 1985). This was also shared with non-Indigenous cultures, where bear naming conventions were used to denote virtuous qualities, power, or spiritual authority, as with Saint Ursula, Nordic *beserkers* or King Arthur (Guenon and Fohr 2004; Liberman 2005; Montgomery 2010; Zimmer 2009).

Kinship stories also reveal biological and ecological information about bear species themselves, as with polar bears and Arctic cultures in North America (Clark and Slocombe 2009). For example, "by describing specific practices for interacting with bears, particularly in conflict situations which the stakes could be high, listeners would be better equipped to handle such situations" (Clark and Slocombe 2009, 42).

2.3.3 Threat

Bears as a threat were depicted in stories about human safety risks, livestock depredation, and infrastructure damage, and they were described in terms of pests or problem animals (Can et al. 2014; McLellan et al. 2017). Expressions of fear dominate, with bears described as villains or conscious killers (Dressel et al. 2015). While a certain level of fear was suggested to be useful in teaching lessons about respect for and safety around bears, this fear can also contribute to widespread eradication of bears as a preventative measure – an issue of concern across different bear species globally (Clark and Slocombe 2009; IUCN 2018; McLellan et al. 2017).

Stories about threatening bears also appear to reflect issues of governance, as seen in Alberta, Canada's grizzly bear (*Ursus arctos*) recovery or protected area management and bear conservation in Abruzzo, Italy (Glikman et al. 2012, chap. 3). Here, stories about 'problem bears' communicate the different ways which people experience, and construct knowledge and

values for bears. In Alberta, Canada, for example, cattle ranchers describe a 'problem bear' as one that has lost respect for people, denoting a human-centric and utilitarian perspective for bears, whereas biologists view people as responsible for finding ways to share the land with bears (see Chapter 3).

In another example, Asiatic black bears in Japan trigger fear and hatred, where culling is used to protect villages (Knight 2000). While historically culling may have been a way to coexist with bears, today culling incites positionality, between urbanites who want to see bears protected from rural villagers who live with the threats bears pose (Knight 2000). Biologists and villagers are also pitted against each other, with bears as threat used in ethical arguments over the value of a human life over that of bears (Knight 2000). Stories about bears as a threat are coincidentally linked to the politicization of bear conservation, and as Knight (2000) suggests, "wild predators are often multi-faceted in the significations attached to them" (145).

Fearful and sensational stories were conveyed in attack books, describing fearsome man-eaters and survivor accounts (Bright 2000; Mueller and Reiss 2005; Shelton 1998). Media accounts also reflected stories about bears, conveying the fear people have of bears (e.g., Sakurai et al. 2013). However, these stories also describe human responsibility in the prevention of bear attacks, and the profound effect a non-fatal mauling has for a person (Hererro 2018; Mcmillian 2011; Van Tighem 2013). These attack stories shifted between conveying fear and appreciating the strength and power of a bear, and perhaps their benevolence

2.3.4 Entertainment

Use of bears in entertainment goes back centuries, from Roman spectacles using captive (and starved) bears to kill slaves or criminals, gruesome medieval bear baiting, or circus performing/dancing bears (Gade 2016; Matheson 1942). These stories reflect the subjugation and

dominion over wild nature, and the pleasure derived from humankind dominating a base animal (Hodgson 2013; Jennison 2005). Modern popular culture uses bears to entertain children, where they are depicted as friends, parents, or teachers, like in the *Jungle Book* or *Smokey the Bear*, where the bear gives advice and guidance (Minor and Boyce 2017). *Winnie the Pooh* is another example, depicting the bear as a naïve but endearing and compassionate friend, yet still suggesting the role that bears play for humans (Milne 1926; Shepard and Sanders 1985). Documentaries or biographies are yet another example that uses bears as a rallying point to focus attention to conservation issues (Mighetto 2007). Other tales, such as *Aesop's Fables* or the story of *Ramakatha*, depict bears as benevolent characters. Jewish biblical texts reference the power of bears (Goldman 1989; Shepard and Sanders 1985). In Christian stories, bear representations range from symbols of virginity and martyrdom to slovenly beasts, barbaric kidnappers, or rapists (Heller 2008; Montgomery 2010; Pastoureau 2011; Shepard and Sanders 1985). As Christian doctrine progressed, stories about bears increasingly reflected the need for people to exploit or dominate these wild, immoral animals (Preece and Fraser 2000).

Lastly, bear iconography (or modern-day effigies) use the bear as mascots for festivals or sports teams, for cafes or breweries, and bear imagery on clothing and jewelry.

2.3.5 Consumption

From folk medicine to legal and illegal trade, bear body parts and pelt are consumed by people, with one potent example being the narrative linking the medicinal qualities of bear parts and bile farming (Hartig 2013; McLellan et al. 2017; Mills and Servheen, 1992; Nijman et al. 2017). These stories also reflect the politicization and market-driven narratives about human-bear relations (Hobson 2007).

Bear hunting, for food or trophy (pelt, parts, picture), describes a primal quest, human courage against a fearsome foe, narratives about what constitutes amusement or sport, conceptions of 'problem animals', and storying about provisioning of food or income across communities (Berres et al. 2004; Dickie 2018; Foote and Wenzel 2009; Hallowell 1926). This is reflected, for example, in stories about polar bears (*Ursus maritimus*), grizzly (brown) bears (*Ursus arctos*) and black bears (*Ursus americanus*) across North America. Contrasting this, recent anti-hunting stories reflect beliefs about the senseless slaughter of bears, the economics of non-lethal consumption (eco-tourism), and the ideology that bears are representations of pristine wilderness (Child and Darimont 2015; Foote and Wenzel 2009; Hughes and Dewart 2017; Kubo and Shoji 2016; Nevin et al. 2014).

2.3.6 Politicization

Stories about bears also reflect socio-political aspects of human-bear or human-human relations, and themselves can become politicized actors. As Hobson (2007) suggests, animals are inseparable from human social, economic, and cultural practices, interconnected in our experiences, for example, as food, pets, amusement, nuisances or spirituality. Studies of political animals have included animal welfare, ethics, and justice, and animals as moral subjects, where the focus is given to coexistence, stewardship, or kinship (Hobson 2007). Political ecology is one such discipline that examines the rights and wellbeing of marginalized people, or in this case animals, by dominant elites (Hobson 2007; Neuman 2004). We can see similar politicized meanings for different bear species.

Grizzly bears, for example, are a symbol of pristine wildness or tender yet fierce motherhood, but they also represent land use and governance disputes across their western North American range (Clark and Rutherford 2014; Hughes and Nielsen, *in press*; Mattson 2014;

Richie et al. 2012). Issues taken with grizzlies are less about the perceived problems or safety risks bears can pose, and more about the loss of decision-making autonomy in land use and feelings of infringement on rights via recovery policy imposition (Hughes and Nielsen, *in press*). As Hintz (2003) suggests, the problem for carnivores like bears is the lack of human recognition to share space with these animals rather than continue a dominion-mentality. Certainly, the greatest threat to this bears' long-term survival resides in socio-political conflict, followed by direct and indirect human-caused mortality (Hintz 2003).

The image of the grizzly or brown bear has also been used in war propaganda, by the US and British to represent Russia (Riabov and de Lazari 2009). Western media used the bear to symbolize Russia as an aggressive, stealthy, and cruel power, to incite fear and paranoia by portraying a cunning predator in wait (Platoff 2012; Riabov and de Lazari 2009). However, in recent years Russia adopted the great bear as a symbol of national pride and strength, used in the 1980's Olympics as a smiling and cuddly icon to soften international perspectives on the country and its people, and more recently to reflect their country as one of "peace-loving power" (Platoff 2012; Riabov and de Lazari 2009). In recent years, grizzly bears have been used in gay culture, to symbolize transformation or emergence and the strength needed or gained in doing so (Ramsey 1997).

The giant panda (*Ailuropoda melanoleuca*) is perhaps one of the most potent and recognisable global icons for conservation, as the symbol of the World Wildlife Fund (WWF) but also a symbol of the Chinese government as a 'soft' power (Buckingham et al. 2013; Hartig 2013; Ran et al. 2009). While 'panda diplomacy' has certainly promoted and demonstrated success in conservation, it has shaped the image of China by having pandas on loan in non-

Chinese zoos, and through this, has become interconnected to an economy of sharing and of international relations (Buckingham et al. 2013).

Polar bears (*Ursus maritimus*), or *nanuq* in Inuktitut, link narratives of climate change and its perils to losing a flagship species, and to the importance of Arctic Indigenous culture. Polar bears are used as part of an emotional appeal to call people to action, and reflect Indigenous Peoples' connection to the land, including their hunting culture and provisioning of food, interpersonal relations and passing down of traditional knowledge, and broader community livelihood benefits through trophy hunting and tourism (Born 2018; Foote and Wenzel 2009; Swim and Bloodhart 2015). As suggested by Born (2018), the "icon of the polar bear localizes the global phenomenon of climate change […] and further connects it to individual fate and suffering" (10). This emotional appeal is important in fostering empathy and behavior change (Swim and Bloodhart 2015).

Politicized bear stories are also present in children's tales, like *Goldilocks and the Three Bears* or *Paddington Bear*. *Goldilocks* has been interpreted as both a cautionary lesson and a demonstration of resilience against alien invaders, whereas *Paddington* has been suggested to represent loss, love and family values along with deeper socio-political tensions related to immigration and identity in the United Kingdom (Elms 1977; Grayson 2012; Shepard and Sanders 1985; Smith 2006; Tatar 2002).

2.4 Considerations for bear conservation

Examining the stories people tell about bears can be an important starting point in developing our understanding of what animals mean to people across different cultures, geographies, and time stories are part of human cognition and meaning-making (Galafassi et al. 2018). Our review helps demonstrate that stories about bears can illuminate culturally situated

values, knowledge, and practices of people towards bears, and "make visible the socially-constructed and organized contours of reality" (Gubrium and Holstein 2008, 262). Stories can embody people's explanation of the order or nature of things, from spiritual beliefs to identity, ecological understandings to behavioural expectations of animals, and even representations of political ideology (Gubrium and Holstein 2008). In addition to belief-based narratives, stories often also serve an educational function, teaching lessons of morality and ethics as well as accounts of everyday occurrences, and, in turn, shape how people come to know the world they live in (Gubrium and Holstein 2008). Indeed, stories illustrate the interplay between experiences, practice, and the environmental condition in which humans live, transcending space and time (Gubrium and Holstein 2008, 250).

In our review, ceremonialism and kinship themes spoke of bear worship as deities or ancestors, as well as taboos for killing or transgressions against bears, and related consequences to humans. While bear worship or taboo may differ across cultural contexts and over time, the notion of respecting bears as sentient beings, as part of ecosystem function, or for their own intrinsic value may be helpful in crafting conservation messages and policy that reflect these beliefs and values (Bhattacharyya and Slocombe 2017; Harding 2014).

In terms of "threatening" bears, these stories serve to not only present cautionary advice on sharing the land with bears but may be detrimental in sensationalizing the discourse around human-bear relationships. Certainly, there is a clear distinction between stories about bears as representative of pristine wilderness (e.g., Harding 2014) to bears as dangerous or savage beasts (e.g., Pastoureau 2011). However, it appeared that in many cases stories about bears as threat serve to incite an emotional response in people, one of fear namely, which in turn could be detrimental to bear conservation. While cautionary lessons are important and can assist

conservation efforts, dramatizing bears-as-threat stories could incite opposition to coexistence. In future, scientists and researchers could seek to work with media personnel to craft messaging about bear safety.

In terms of bears framed in entertainment or consumptive stories, these appeared to relay notions of the utility of bears, from physically or symbolically addressing people's needs. While some uses are likely distasteful, including uses like bile farming from humane and ethical perspectives, these narratives nonetheless provide insight into the different ways of valuing bears. With this in mind, policies could address these unsettling practices and attempt to motivate belief and behavioural change in others, for conservation purposes. However, we also think we should ask: is it ethical to impose Euro-centric cultural imperialism on others, to address what we perceive as abhorrent treatment of bears (e.g., bile farming) where others might not? Whatever the debate may be, we feel this necessitates critical reflection and discussion on the framing of animals as natural resources to be utilized, and how and where Euro-centric beliefs might intersect or conflict with other cultures' values about animals and what this means for conservation.

Lastly, bear stories also reflected political agency (e.g., polar or panda bears), used as a symbolic of the plight of wildlife, the burden of conservation policy on people's livelihoods and wellbeing, diplomacy and goodwill, or represent hope for species survival through human ingenuity (Hobson 2007; Knight 2008; Manzo 2010; Mattson et al. 2006; Richie et al. 2012). As Knight (2000) suggests, the conflict between people and bears can oftentimes reflect the conflict between people themselves, or with agencies in wildlife management. For example, in the Euro-North American west, grizzly bears can represent the people-people conflict over land use, power, and governance rather than actual human-bear conflicts (Clark and Rutherford 2014;

Wilson et al. 2014). While not directly related to crafting messages about bear conservation, important considerations can be given to policy processes, from engaging interest groups to actively listening and considering their interests, needs, and expectations in policy development and implementation. In the case of polar or panda bears, for example, bear iconography has been used in conservation messaging to motivate people to action, and this can certainly be useful though considerations for message framing and unintended consequences should be examined (Born 2018; Hartig 2013; Swim and Bloodhart 2015).

2.5 Conclusions

Certainly, bear species occupy a range of symbolic meaning to people, from magnificent to endearing, amusing to gullible, divine to fearsome, useful to detestable, rooted in the stories different people tell about bears over space and time (Hobson 2007; Ingold 1994; Janoušková 2007). Future work to examine human-animal relations through story could look to conservation psychology as an analytic lens. This perspective may be useful in articulating the multi-functional foundations of human thought, emotion, and behaviour regarding the animals that share our world (Clayton and Meyers 2009). Political ecology offers another perspective that may be useful in examining stories about bears relative to issues of power and governance in conservation contexts (Robbins 2012). Lastly, we suggest Laswell's (1971) policy sciences framework could be used to uncover the complexities inherent in people's valued interests, demands, and expectations regarding carnivore conservation policy as it intersects their wellbeing and livelihoods (Clark 2002). Using this approach could be useful in identifying common ground and in designing conservation interventions that reflect positive narratives about bears or identify negative connotations and dispel myths (Blicharska and Mikusinski 2014; Brown and Clark 2006; Mattson et al. 2006; Richie et al. 2012). Indeed, conservation policy

itself is a story about certain peoples' values for bears, power in decision-making processes, and normative expectations from policy direction.

Undoubtedly, storytelling will remain a socially and culturally-important way to transmit values, knowledge, attitudes, and practices regarding human-bear or other human-animal interactions (Ingold et al. 2018). The symbolic potency of these stories can, however, play a role in framing the conservation narrative, garnering support or opposition to policy action (Camino et al. 2016; Clark and Rutherford 2014; Infield et al. 2018; Waylen et al. 2009; Wondolleck and Yaffee 2000). As Zemmelman (2012) puts it, "our experiences, our myths, our religions, even our sciences [are] all stories" (7). Through the storying of our subjective experiences with bears, we can make sense of what bears mean to us (Ingold 1994; Jensen 2013; Zemmelman 2012). As conservationists, our role is to seek understanding of these stories in order to incorporate culturally relevant information into policy design. In turn, this can enable conservation policy to better resonate with people - creating synergy between social, cultural and ecological values and meanings – and in hopes, achieve success.

3 From human intruders to bear attacks: A content analysis of grizzly bear newsprint

3.1 Introduction

Grizzly (brown) bears (*Ursus arctos*) occupy a special place in human imagination (Zemmelman 2012). To some they are icons of nature's rugged and raw power; to others, they represent threats to safety and economic costs of living with carnivores (McFarlane et al. 2007; Richie et al. 2012). These representations are increasingly reported in news media, which has the potential to both reflect and influence human perception and behavior (Kaczensky et al. 2001; Sakurai et al. 2013). Certainly, news media can help or hinder conservation efforts by shaping public perception and behavior through message framing, agenda-setting and attention cycle (Downs 1972; Sakurai et al. 2013). For example, stories eliciting an emotional reaction that pique curiosity or spark debate and repetitively showcase certain narratives can influence what and how people interpret information (McCombs 2014). Simply put, sensational stories sell, and journalists know this (McCombs 2014).

Stories about bears, for example, become newsworthy when tragic incidents occur or management controversies emerge (Sakurai et al. 2013). Siemer et al. (2007) found that coverage of human-bear conflicts dominated media discourse compared to management topics. This emphasis on the sensational has also been found with other species, such as sharks, leopards or panthers. For instance, coverage of human-shark interactions has emphasized attacks over that of conservation issues like habitat loss, pollution, or overfishing (Muter 2013). Researchers have suggested such stories dramatize human-wildlife relations and may invoke fear or intensify perceptions of economic risk (Bhatia et al. 2013; Gore et al. 2005; Muter et al. 2012).

On the other hand, news media can generate substantial support for species conservation. This was seen with coverage of the death of a Zimbabwe lion or Alberta grizzly bear, igniting

public debate and activism and perhaps improving awareness of the risks to species and conservation challenges (Foote and Nielsen 2017; Jacobsen et al. 2011; MacDonald et al. 2016). Certainly, media can play a role in shaping normative thought and behavior in the public and thus conservationists and managers would benefit from understanding how media communications has shaped knowledge, attitudes, and support for grizzly bear conservation (Jacobsen et al. 2011; Kellert et al. 1996; Matthes 2009; McCombs 2014; Muter et al. 2009).

3.2 Study context

Across North America, grizzly bears are managed according to different mandates. Grizzly bears in Idaho, Montana, Washington and Wyoming, U.S.A. are protected as an endangered species, except the recent delisting of bears in the Greater Yellowstone Ecosystem (U.S. Fish and Wildlife Service 2017a). In Alaska grizzly bear hunting is permitted, with possible changes in protection across state refuges forthcoming (U.S. Fish and Wildlife Service 2017b; Joling 2017). In Canada, grizzly bears are a species of special concern and managed according to provincial jurisdiction (COSEWIC 2012). Bears across Nunavut, Northwest Territories and Yukon Territories are legally hunted outside of protected areas, whereas trophy hunting in British Columbia has been abolished (British Columbia Government 2017; COSEWIC 2012). In Alberta, grizzly bears are the only population listed as threatened under the provincial Wildlife Act, with a hunting moratorium in effect since 2006 (Alberta Grizzly Bear Recovery Plan 2008).

Despite these differences, the greatest threat to grizzly bears in North America is human-caused mortality due to human-bear conflict and/or habitat loss and fragmentation (COSEWIC 2012; McLellan et al. 2017). Climate change may also threaten habitat (food availability and distribution) and, in particular, the expansion of human land use (Roberts et al. 2014). Research

examining the role of media in shaping public perceptions towards bears often highlights attacks which in turn can heighten the perception of risk (Sakurai et al. 2013). However, if messaging is appropriately framed, media communications can potentially serve another function, including raising awareness and educating the public (Siemer et al. 2007). How information is communicated on grizzly bears will be important for conservation practitioners to understand to garner further conservation support.

3.3 Theoretical framing

Using media content analysis (MCA), we explored newsprint stories on grizzly bears across their North American range between 2000 and 2016. MCA is the systematic characterization and evaluation of a body of text to infer meaning and description of content conveyed to a readership (Krippendorf, 2004; Franzosi, 2007). This includes identifying the framing of newsworthy messages by journalists, the agenda conveyed, and attention given to a particular topic over time (McCombs, 2014; Sakurai et al., 2013; Price et al., 1997). Framing refers to how a story's content is organized and communicated which can influence how readers perceive something as interesting or problematic, or signal how the author intends the reader to feel (Nwabueze & Egbra, 2016). This includes thematic or issues-oriented framing that references a broader context, and episodic or event-oriented framing that refers to a specific incident (Bhatia et al., 2013). Framing can reinforce ideology, incite critical reflection, or create contrast between what's good or bad (Boreus & Bergstrom, 2017; Simon & Xenos, 2000). Headlines, content composition, word use, interviewees, or imagery are key elements of the story that are worthwhile to examine in message framing (Boreus & Bergstrom, 2017; Matthes, 2009).

Media agenda-setting is also worthy of investigation, referring to the prominence and repetitive coverage a certain topic receives over time (McCombs, 2014; Scheufele & Tewksbury,

2007; Wolfe et al., 2013). For example, media analysis of how sharks are portrayed found attacks were reported five times more frequently than positive conservation news, ostensibly, fueling negative public perceptions of sharks (Muter et al., 2012). Agenda-setting, framing and sensationalism can originate from journalists' preferences to report on certain topics, a company's requirement to sell subscriptions or improve ratings, or socio-political or economic factors (Pews Research Center, 2007; Shoemaker and Reese, 1996; Trussler and Soroka, 2013).

The attention and repetition of a news story over time is also of interest, as this can perpetuate public interest in a topic (Downs, 1972; Wolfe et al., 2013). For example, a single news article can stimulate dissemination of subsequent stories if it generates public interest – if the people ask for a topic and consume it, the press will publish more of it (Miller & Riechert, 2008). This is demonstrated with media coverage of Zimbabwe's Cecil the lion, or Alberta's Bear 148 (MacDonald et al., 2016; Foote and Nielsen, 2017). However, media attention can wane unless a new angle on the same story is used to reignite public interest (Downs, 1972).

Additionally, we were also interested in examining news stories for the attitude expressed by journalists and the representative anecdote, or broader narratives symbolizing common themes conveyed to the readership in the news story (Kaczensky et al., 2001; Gore et al., 2005; Parker and Feldpausch-Parker, 2013). Taken together, examining news stories can not only illustrate how grizzly bears are portrayed to the public but also provide how information shared with the public can influence public knowledge and attitudes towards, in this case, grizzly bears and their conservation (Houston et al. 2010; Muter et al., 2012; Reese et al., 2001; Wolfe et al., 2013).

3.4 Methods

We used Factiva and Sun Media, two online searchable databases, and circulation statistics reported from Media Intelligence Center, to identify relevant newspaper sources across the North American (Canada, United States) distribution of grizzly bears (Alliance Audited Media, 2017). We used these databases given availability of online content within our study scope, budget, and ease of use. A comprehensive search string with Boolean operators and keywords, including a "NOT" list to reduce excessive or irrelevant search results (e.g., descriptions of grizzly bears related to music festivals, football games, zoo reports editorials; see Appendices) was then used to collect relevant news stories. Note that a limitation we encountered was that smaller, rural newspapers, largely across the western USA, were inaccessible as they were not digitally archived or there was prohibitive costs to access additional databases.

Codebook development was informed by other similar studies, refined through four different intercoder training sessions, and then entered into Survey Monkey (2017; Gore et al., 2005; Kaczensky et al., 2001; Sakurai et al., 2013). Eighteen variables were organized into four categories: (1) general information, including geographic source location, date, newspaper name; (2) dominant theme, including science, human-bear conflict, or hunting; (3) attitudes, adapted from Kellert's (1994) typology; and, (4) representative anecdote that convey a broad message about bears to the readership.

We used Kellert's (1994) attitude typology in order to identify the dispositions the news story conveyed to the readership, whereas we developed the representative anecdotes through intercoder test phases based on the broad narrative that emerged as an overarching sentiment of the news story (Kaczensky et al., 2001; Gore et al., 2005; Parker and Feldpausch-Parker, 2013).

Upon review of Kellert's (1994) typology, and our first test coding phase, we determined that some attitude categories held similar descriptions, and so condensed the original typology into: moralistic (naturalistic, humanistic and moralistic); aesthetic (symbolic and aesthetic); utilitarian (utilitarian and dominion); and, ecological (ecological and scientific). We also combined neutral and negative attitudes, as test coding revealed that certain news stories reflected a combination of these attitudes (e.g., avoidance of bears related to fear or safety risk; Kellert, 1994). News story attitude and representative anecdote were subsequently coded based on the coder's overall impression of the content communicated. Once coding was completed, data were exported from Survey Monkey (2017) and organized in Excel 2010.

Krippendorf's alpha was used to test inter-coder reliability on a subset of total articles (*N* =62) we coded for the dominant theme (Krippendorf, 2004; Lombard et al., 2002; Lombard et al., 2004). We considered our coefficient ($\alpha = 0.711$) acceptable for intercoder reliability, with a minimum range of $\alpha = 0.667$ suggested by Riffe et al. (2005). We test coding reliability of the dominant theme as this was the major categorical variable under which all other variables would be coded. As Riffe et al. (2005) suggest "the simpler it is to recognize when the concept exists in the content, the easier it is for the coders to agree and thus the better the chance of achieving reliability in the study" (pp. 126). We did not test intercoder reliability on attitudes or representative anecdotes, given time constraints and impracticality of testing all variables, as well as the difficulty in coder agreement when coding for latent content (Lombard et al., 2004; Riffe et al., 2005). However, this does not mean analysis of latent content should be avoided or that this analysis would lack significance to overall study outcomes (Riffe et al., 2005). As such, we retained attitudinal and anecdote variables as our coding would reflect the interpretation of news stories across a broader public readership – how the public may interpret different

narratives or words used (Riffe et al., 2005). That said, this does pose a possible limitation in the study outcomes, and as such future work should seek to limit the number of complex categories requiring interpretation (Riffe et al., 2005).

Following reliability testing, Excel 2010 was used to descriptively analyze data, and χ^2 tests were performed to determine if relationships existed between variables ($\alpha < 0.05$ designating significance). No more than 20% of expected counts in χ^2 were less than 5, and all individual expected counts were equal to or greater than 1 (Yates et al. 1999). However, we note that coder drift may pose a limitation to this study, given the lengthy timelines between test coding and final coding, as well as the subjectivity of coding across our diverse team (Bartholomew et al., 2000). However, we used extensive intercoder training sessions to mitigate this limitation and help ensure consistency in coding.

3.5 Results

We gathered 1,496 news stories published between 2000 and 2016 indexed into a spreadsheet, with one article randomly distributed to each of the five coders until all articles were assigned. During the coding process irrelevant stories (e.g., football game) that were not screened out were removed manually by coders, leaving 1,285 applicable news stories for analysis. Table 3-1 identifies the total number of stories by year and location, with figure 3-1 illustrating the geographic location.

Table 3-1 Total number of newsprint articles by year and location

Year	Alberta	British Columbia	Western USA	National (US and Canada)
2000	26	0	0	2
2001	24	7	2	4
2002	68	16	0	4
2003	48	10	0	2
2004	61	10	1	6
2005	99	2	0	15
2006	63	1	0	0
2007	80	8	0	5
2008	85	5	0	3
2009	65	6	0	3
2010	68	6	1	8
2011	57	6	0	4
2012	63	7	0	3
2013	77	16	0	6
2014	90	10	2	3
2015	74	13	11	5
2016	22	1	1	0
Total	**1070**	**124**	**18**	**73**

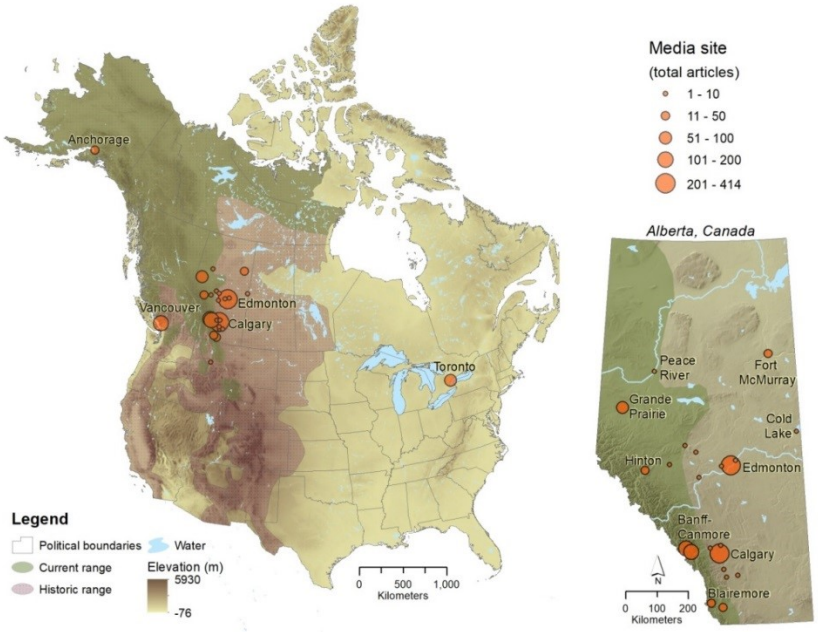

Figure 3-1 Illustration of article location broadly across North American grizzly (brown) bear range, and Alberta specifically

Of the coded articles, the majority (N = 1,212) were from western Canada including Alberta and British Columbia, followed by the western United States (Alaska, Idaho, Wyoming, Washington, Montana; Table 3-1). Note that given difficulties in accessing news stories across the western United States, we grouped available data as an overall western United States perspective and not by individual state. This is the same for national news stories reported by *The Globe and Mail*. While still insightful, this presents a study limitation and future research opportunity.

We assessed the frequency of key words (N =12,192) used in titles of news stories, which may garner the reader's attention. Most frequently used words were "kill" (N =125), "hunt" (N =107), "attack" (N =103) and "death" (N =76; Fig. 3-2).

Figure 3-2 Word cloud visualizing use of key words across newspaper article titles

Coding for the dominant theme identified two episodic frames, human-bear conflict | (N =777) and hunting (N =181), and one thematic science frame (N =327) were identified (Fig. 3-3).

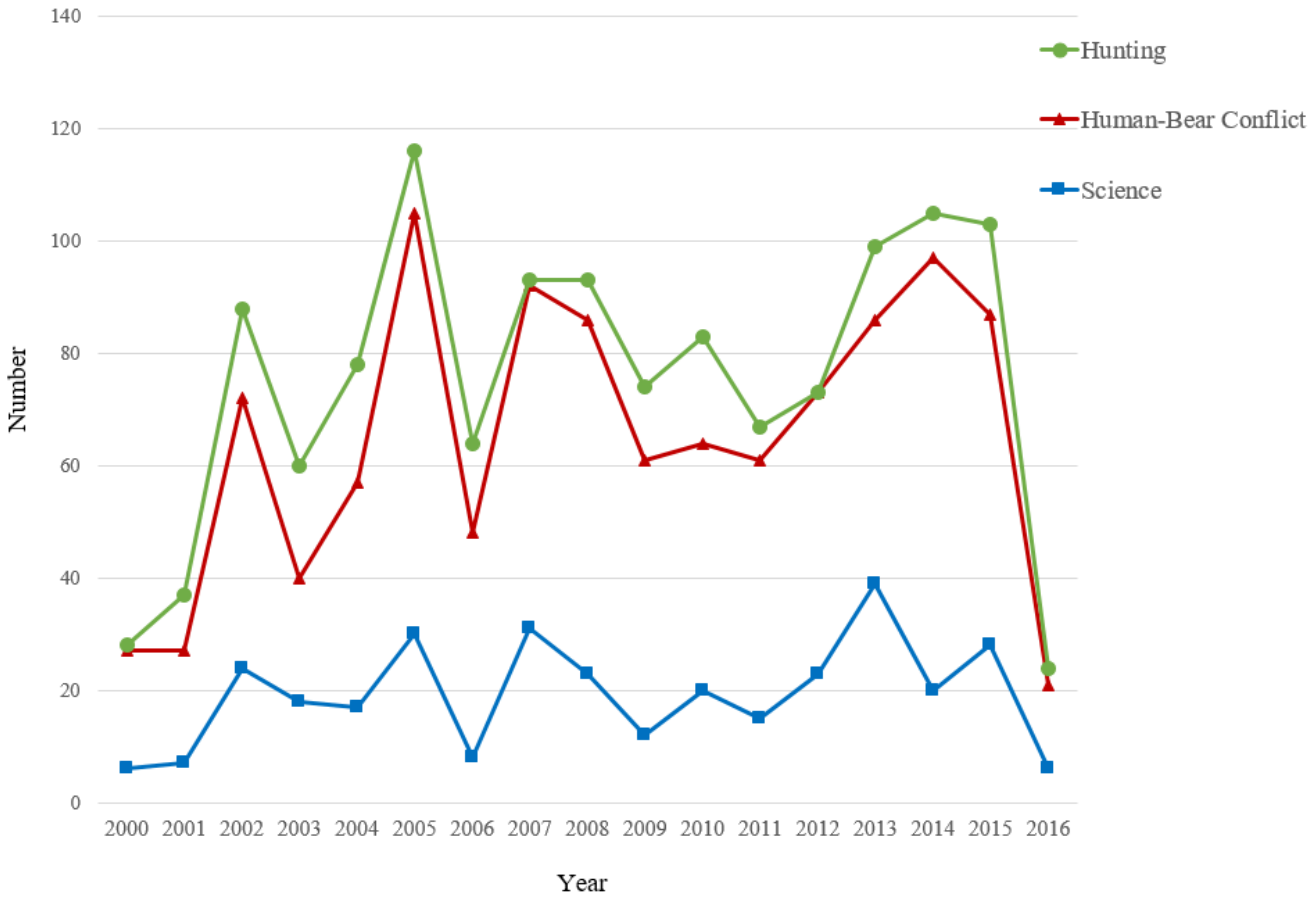

Figure 3-3 Episodic (human-bear conflict, hunting) and thematic (science) frames across newsprint

We used χ^2 test to determine if a relationship existed between the year a news story was published and if a particular attitudinal expressions was associated with said article. The only relationship we found was conveyance of an ecological attitude in news stories published in 2002, 2003, 2005, 2012, 2013 and 2014 ($\chi^2 = 109.88$, $df = 45$, $P < 0.05$, 37.8%; Table 3-2). No relationship existed between attitudinal expression and news stories published in other years, and we could not preform χ^2 tests on aesthetic attitudes given insufficient data.

Table 3-2 Relationship between year of publication and conveyance of an ecological attitude

Year	*P*	χ^2	*df*
2002	0.037	8.49	3
2003	0.002	15.269	3
2005	0.031	8.90	3
2012	0.042	8.22	3
2013	0.004	13.53	3
2014	0.252	4.09	3

Of all news stories, we found that a dire state representative anecdote was most reported (32.8%), and was associated with stories published at the National news level (N =73, χ^2 =*19.04, df = 5, P<0.05,* 34.3%; Table 3-3).

Table 3-3 Representative anecdote by dominant theme as percentage

	Human-Bear Conflict (N =777)	Science (N =327)	Hunting (N =181)	Total (N =1285)
Dire state for grizzly bears	15.3	9.18	8.33	32.8
Grizzly bears are a public safety threat	23.4	0.39	0.39	24.1
Government management responsibility	8.64	3.19	2.49	14.3
More research is necessary	2.26	10.0	1.32	13.6
Communities play a role in management	8.87	1.09	0.39	10.4
There are no problems for/with bears	2.02	1.56	1.17	4.75

3.5.1 Human-bear conflict

Of human-bear conflict news stories (N =777), bear sightings (34.6%) and attacks or human fatalities (24.6%) were most frequently reported (Fig. 3-4). Less common were stories reporting accidental bear mortalities (14.7%), such as train collisions or being mistakenly killed as a black bear, or damages caused by bears (8.40%) to infrastructure or personal property. Of

human-bear conflict articles, 6.20% referred to bears being illegally killed and 11.6% did not specify type of conflict.

We found that attitudinal expressions across human-bear conflict stories were associated with the type of conflict reported (χ^2 =239.8, *df* = 20, *P* <0.05), emphasizing stories that featured attacks or fatalities on humans (χ^2 = 89.79, *df* = 4, *P* <0.05). The most common attitude expressed in these stories were negative/neutral (40.3%), followed by ecological (27.5%). The most commonly conveyed representative anecdote was the safety risks posed by bears (38.6%), followed by a dire state for grizzly bear populations (25.4%). These messages were associated with stories on bear sightings, attacks or fatalities on humans (χ^2 = 65.85, *df* = 5, *P* <0.05).

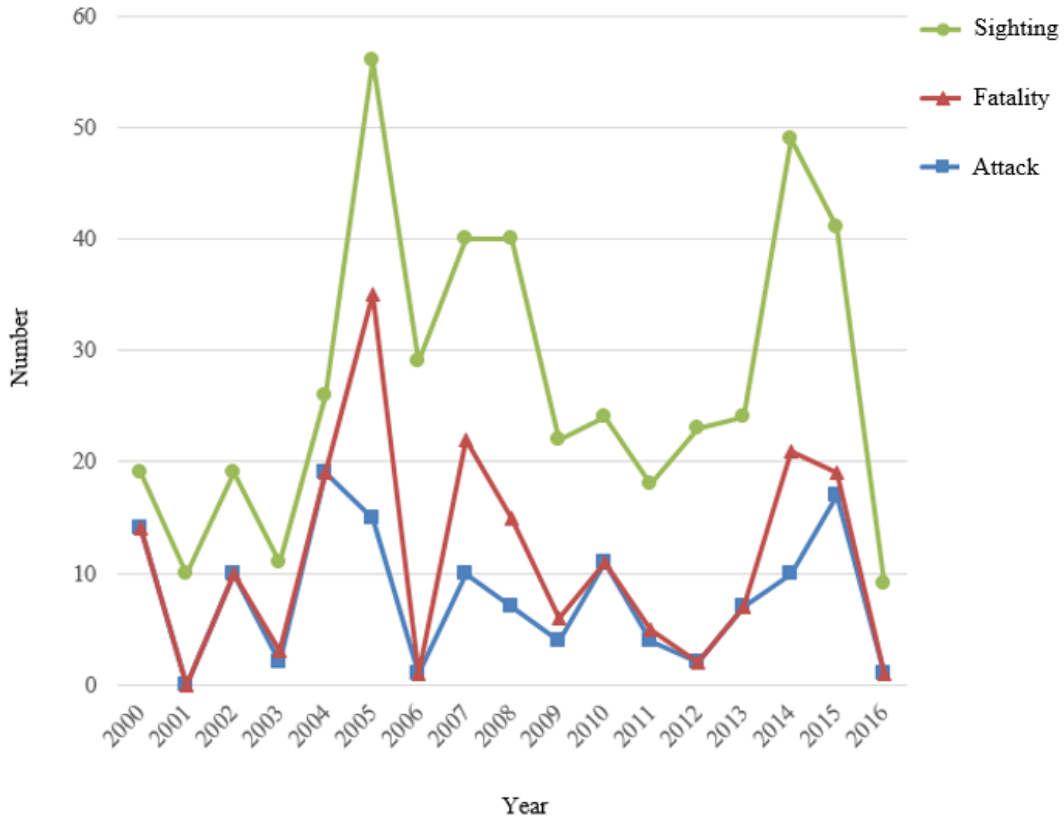

Figure 3-4 Sightings, fatalities and attacks reported by year across all newsprint (*N* =1285)

The most frequently attributed cause of conflict was bear behavior (29.7%), followed by a combination of human and bear behavior (27.8%), and then human behavior alone (23.4%, Fig. 3-5). Outcomes reported as a result of the conflict incidence included local area closures or safety warnings, cleaning up attractants, or employing mitigations (e.g., electric fencing, 35.3%). Combined (25.0%) government or ENGO management actions included increased monitoring intensity, short- or long-distance relocation, aversive conditioning, intercept feeding, or euthanasia. Only 7.72% of these articles indicated a bear was killed in self-defence, whereas 32.1% of articles did not offer a solution to conflict incidences. Primary voice communicating information was government staff (49.7%), followed by commentary from the general public (25.7%), and ENGOs (10.6%). Academics, recreationalists, forestry, petroleum, and agricultural industries together comprised 13.2% of commentary, with 0.80% of articles unspecified.

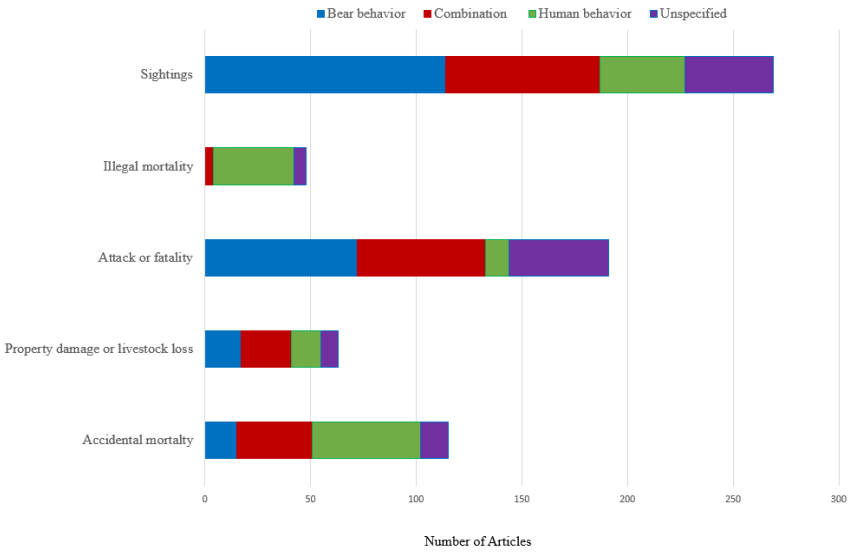

Figure 3-5 Probable culprit of conflict reported by Human-Bear Conflict newsprint (*N* =777)

3.5.2 Hunting bears

Hunting topics (*N* =181) reported included establishing or maintaining a suspension (48.1%), reopening or setting limits (quotas 21.0%), poaching (18.2%), and uncertain opinions

on hunting (12.7%). Of these, 67.4% reflected debate on hunting in Alberta, and 48.4% reflected consternation over Alberta's hunting moratorium, established in 2006. Combined 2005 2006, and 2010 had the highest frequency of reporting on hunting moratorium (23.0%, Fig. 3-6).

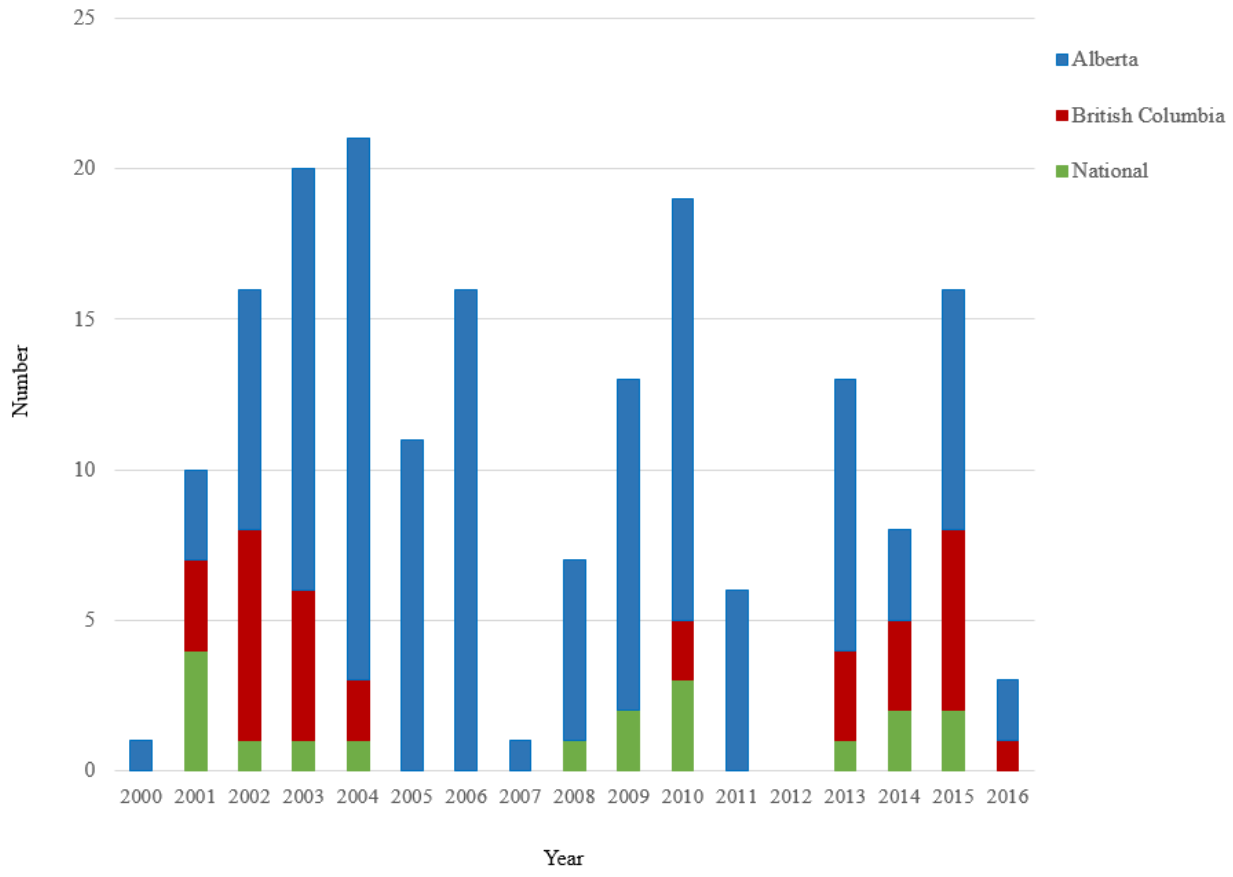

Figure 3-6 Articles discussing a hunting moratorium (*N* =87) reported by location

Attitudinal expressions were significantly associated with reporting of the hunting moratorium ($\chi^2 = 20.81$, $df = 4$, $P < 0.05$), with moral sentiments most frequently communicated (44.4%). A "dire state" representative anecdote dominated hunting articles (59.0%), followed by communicating "government responsibility" to manage bears (17.7%). Environmental organizations (36.5%) were the primary voice reflected in hunting articles, followed by government officials (29.3%) with sportsmen or recreationalists being infrequent (4.97%).

3.5.3 Grizzly bear science

Articles on scientific research (*N* =327) were reported most frequently from Alberta and British Columbia (84.4% 11.3%), sharing information on "bear population" (44.0%) and "habitat studies" (24.8%), "educational outreach related to scientific findings" (17.1%) and "climate change or calls for new research" (14.1%, Fig. 3-7).

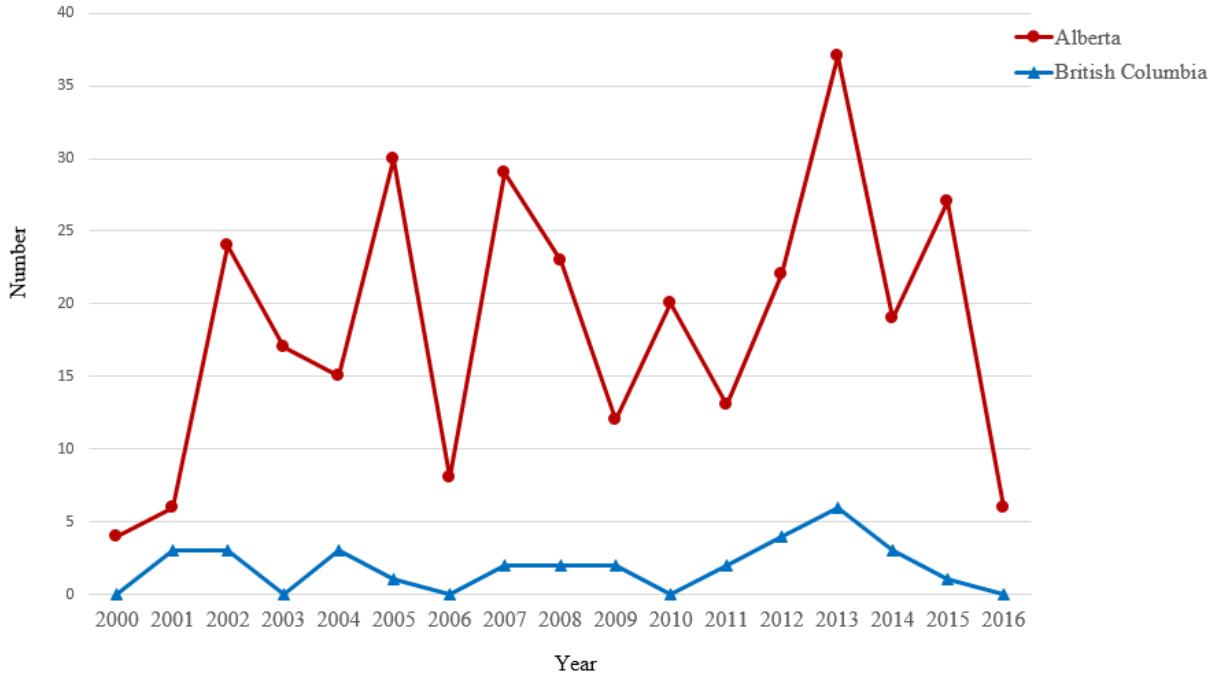

Figure 3-7 Science articles (*N* =327) reported across Alberta (*N* =280) and British Columbia (*N* =32) between 2000 and 2016

Solutions were proposed in nearly half (49.2%) of articles, predominantly from academics or researchers (47.4%), followed by government staff (26.9%) and environmental organizations (18.0%). The most frequent attitudinal expression conveyed was "ecological" (77.4%). Science articles were associated with three representative anecdotes ($\chi^2 = 51.21$, $df = 8$, $P < 0.05$); "safety threats posed by bears", "dire state" and "government responsibility" (39.5%, 36.1% and 12.5%).

3.6 Discussion

Stories about grizzly bears and their conservation in North America were analyzed to identify what content is shared, how messages are framed for the public readership, and the relative attention given to topics over time (McCombs, 2014; Price et al., 1997). We identified the use of sensational words in the titles of newsprint stories, which might be used by a newspaper editor or journalist to garner the readerships' attention (Freeman and Jarvis, 2013). In turn, this might influence how people construct their image or understanding of grizzly bears. Word choice, coupled with image selection if available in news stories, might be the first step in manufacturing public narratives about bears. Certainly, newsprint media's influential role is not a new revelation in wildlife conservation, where media framing can have a potentially powerful impact on public opinion or action (Cohen and Richardson, 2002; Giblett, 2006; Horak, 2006; Jacobsen et al., 2011; MacDonald et al., 2016).

We also categorized reporting based on specific events and thematic content. Episodic frames dominated newsprint articles, reflecting human-bear conflict and the grizzly bear hunting debate. Geographic source reporting for human-bear conflict articles was predominantly from Alberta and British Columbia, reflecting controversial discourse across these regions since Alberta's 2006 hunting moratorium and 2010 threatened species listing (Alberta Sustainable Resource Development, 2008). Scientific research, including communicating results from recent studies on grizzly bear population dynamics, habitat use or needs, and calls for new or additional research was the only thematic frame identified across all news stories. Alberta again dominated this research storyline as a geographic source, which likely reflects the threatened status and associated recovery priorities (i.e., research) for grizzly bears in this province.

Upon examining the representative anecdote across the three themes, polarization exists between positioning grizzly bears as a threat and as threatened. This opposing framing has the potential to invoke public perceptions of fear or risk perhaps above other messages that would otherwise encourage positive conservation action and human accountability of living, working or recreating in bear country. For example, a combination of keywords used in titles (e.g., "marauding bears") combined with the sensational storying of a bear encounter may invoke an emotional response (Matthes, 2009; Nwabueze and Stella, 2016; human-bear conflict stories; Wozniak et al., 2015). Certainly, how news media frames information on grizzly bears, or other wildlife species, has the potential to elicit emotional and cognitive responses and in turn, affect people's receptivity to bear conservation (Lakoff, 2010).

Indeed, framing may be of utmost importance in communicating human-bear interactions as these interactions are often reported as "conflict" incidences which may be erroneous if the interaction was merely a bear sighting or other non-confrontational exchange. And while we captured sightings information under the human-bear conflict theme, this illuminate the error of judgement by both journalists or those interviewed for a news story, but also the changes required of scientists in conservation vernacular describing human-bear or broader wildlife interactions, including what actually constitutes "conflict." Certainly, this type of reporting can perpetuate public fear and risk perceptions, suggesting the mere presence of a bear is an imminent threat or influencing the readership to believe bear sightings may be as common or dangerous as actual conflict incident (Muter et al, 2009; Sakurai et al., 2013). Given the use of particular attitudinal expressions and anecdotes, this framing of human-bear conflict stories may in fact run counter to bear conservation objectives. Or perhaps this style of reporting high-consequence and dramatic incidences reflects a journalistic perspective (or pressure) of "*if it*

bleeds, it leads" (Muter et al., 2013; Serani, 2008; Stoop, 2007). Certainly, content that is not exciting or dramatic might lose public attention, and in turn purchasing newspapers, and so perhaps it follows that emotional or controversial stories of bear-bites-man events become headliners (Downs, 1972). While some conservationists may think front page grizzly bear news can work to heighten public interest, the negative connotations associated with titles, content or even images used may counter conservation objectives.

While unlikely that media generally has a strong interest in bear management, some individual journalists may have a bias for keeping bears front and center. In these cases, media framing could report grizzly bear stories with positive outcomes, such as identifying human responsibility in bear management, conveying ecological values of bears, or ethical concern for their conservation and thus function as a useful medium for public education (Freeman and Jarvis, 2013). For example, polar bears have become perceptually associated with climate change, where media reporting has been found to induce empathy and activism amongst environmentalists and broader public alike (Swim and Bloodhart, 2015). Or in the case of debate around delisting Yellowstone grizzly bears, communications on the topic was found to incite ethical arguments on bear management, as well as uncover distrust in managing authorities and disputes over land use policies (Parker and Parker-Feldpausch, 2013). Media can therefore play a powerful role in creating and disseminating information to the public, as well as influencing values, attitudes, and actions (Freeman and Jarvis, 2013).

In terms of news stories debating grizzly bear hunting, which were dominated by Alberta sources, it may be that newsprint media was used as both an advocacy platform and a stirring stick to incite debate about the legitimacy or ethics of trophy hunting. These stories also corresponded to high profile attacks with hunting suggested as a management tool to address

human-bear conflict incidences. Certainly, media communications can mobilize public action and encourage policy change, as demonstrated in social action occurring across other environmental issues (Gamson and Wolfsfeld, 1993; Stoddard and MacDonald, 2011; Swim and Bloodhart, 2015).

Science-related information communicated in media stories again originated from Alberta, and specifically addressed research needs related to recovery priorities, including population or habitat studies, or specifically addressing bear mortality as in Banff or Jasper National Parks (Alberta Sustainable Resource Development, 2008). A small number of experts leading on grizzly bear research were quoted in these stories, with journalists capturing factual and current information. That said, science news stories lacked reporting on the science of human dimensions of bear conservation, and when this information was communicated, it was written relatively dispassionately.

Of the science stories, those on spilled grain and bear mortality research in Banff National Park discussed the moral imperative to take action for bear survival, which likely elicits an emotional response from the readership, given the nature of reporting (Derworiz, 2016). These science stories can perhaps be used to incite public activism for bears rather than position "man versus bear" as seen with conflict stories. That said, while reporting on science is an important part of bear conservation, these news stories are often not sensational and appear less frequently in the media.

Overall, as with other similar work we found that sensational stories garnered more attention by news media, where a single 'bear-bites-man' incidence garners more attention than a new scientific findings. Of course, media personnel's' prerogative is to report on narratives that will resonate with the public and generate attention (Serani, 2008). While journalists are

expected to be guided by their ethics and objectively report on stories, other factors may affect what is reported, how, and why, such as employer or organizational expectations, or market-based drivers (Iggers, 2018). In turn, the public may be fed a diet of laundered information that in turn can influence public perceptions and opinion on, in this case, bears and their conservation (Kaczensky et al., 2001; Muter et al., 2009; Stoddard and MacDonald, 2011).

That said, we acknowledge all communication is comprised of senders and receivers, where receivers construct their own meanings from news stories, including how these stories resonate with personal experiences, knowledge or attitudes, or current socio-political or economic contexts (Swim and Bloodhart, 2015). Certainly, the news media can assist bear conservation efforts through use of positive framing and attention on stories that advocate for stewardship actions (MacDonald et al., 2016; Sakurai et al., 2013).

3.7 Conclusions

Newsprint media most certainly remains central to how people receive their news, and can be an insightful source of information that conservation practitioners look to as both a platform to understand public debate, as well as educational opportunity (Houston et al., 2010; MacDonald et al., 2016). In fact, smaller more rural and remote communities may prefer newsprint media compared to their urban counterparts, given limited online or broadcasting capabilities and personal preferences (Ramsey & Moss, 2009). Certainly, these rural communities are the people who also live more closely with bears I daily life than their urban counterparts. With newsprint media being preferred, analyzing news stories for explicit and latent content relative to grizzly bears and their conservation makes sense.

Using media content analysis, I demonstrate the power of newsprint media to influence public interpretation of grizzly bear topics. Although the specific relationship between public

demand for certain stories and the media's response is unclear, the opportunity to cultivate responsible and evidence-informed norms seems apparent and something to be strongly encouraged. As such, it would be prudent for conservation practitioners to be proactively involved in media communications on grizzly bears or other species for that matter, to help ensure messaging is accurately framed. Future research should also assess the international scale of media communications on grizzly (brown) bears and their conservation, in both print and online content (Akintola, Lavis & Hoskins, 2015; Pews Research Center, 2017).

4 The social process of Alberta's grizzly bear recovery: A case study

4.1 Introduction

It is widely recognized human relationships with carnivore species are complex, shaped by cultural, political, economic, and environmental factors (Clark et al. 2014; Dickman 2010; Hintz 2003; Treves et al. 2017). Commonly, human-wildlife conflict results with carnivores viewed as threats to human safety or financial interests and subsequently killed in retaliation or as a preventative measure (Madden and McQuinn 2014; Richie et al. 2012; Treves and Karanth 2003). Human-wildlife conflicts are especially pervasive in contexts where people depend on natural resource production for human well-being (Hill 2015; Rust and Taylor 2016; Scarce 1998; Young et al. 2015). Typically, rural people are expected to live with carnivores and adopt policy outcomes, yet conservation policy may be viewed as an imposition on livelihoods and as a result, people may oppose conservation (Hill 2015; Kreye et al. 2017; Neumann 2005; Pohja-Mykra 2016). We suggest understanding the human side of carnivore conservation and policy processes is therefore necessary to achieve desired outcomes (Hill 2015; Mascia et al. 2003). Who is involved in conservation policy decision-making? What do people want, and what do species require for conservation action? Do these values and needs intersect or conflict? Ultimately, who gets to decide? These are just some of the necessary questions to ask in conservation policy processes (Lasswell 1971).

As part of a broader study we qualitatively explore the ongoing acrimony in Alberta, Canada's grizzly bear (*Ursus arctos*) recovery, despite nearly a decade of conservation action (Alberta Environment and Parks 2016; Gibeau 2012; McFarlane et al. 2007; Oppenheimer and Richie 2014; Richie et al. 2012; Rutherford et al. 2009; Walton 2006). We also integrate social process mapping and conceptual descriptions from wildlife value orientations (WVO) and

wildlife attitudes literature into a social constructionism framework to help explain what grizzly bears and recovery mean to the people expected to live alongside these bears (Chase et al. 2016; Clark 2002; Gergen 2015; Kellert 1996; Lasswell 1971; Mandfredo and Dayer 2004; Scarce 1998).

4.2 Study context

Alberta's grizzly bears once numbered in the thousands, but increasing human populations, habitat loss and fragmentation, and direct (e.g., conflict) and indirect (e.g., vehicle collision) human-caused mortality have resulted in bear population decline and range contraction (Kansas 2002; McLellan et al. 2017; Nielsen 1975; Nielsen 2005). In 2002 a government committee identified a path forward for conserving Alberta's bears, with a hunting moratorium established in 2005, and grizzly bears listed as threatened in 2010 (COSEWIC 2012; Kansas 2002). A recovery policy was subsequently developed, prioritizing linear footprint and attractant (e.g., garbage) management, applied research, educational outreach, and inter-jurisdictional cooperation (Alberta Grizzly Bear Recovery Plan 2008).

Currently, an estimated 691 grizzly bears range across seven demographically separate Bear Management Areas (BMA) spanning approximately 170,000 km^2 (Fig. 1-2; Alberta Environment and Parks 2016). This encompasses over 70 different human communities including Indigenous settlements, as well as forestry, petroleum and agricultural operations, and recreational areas (Alberta Environment and Parks 2016; Festa-Bianchet 2010). Despite achievements in recovery, such as population estimates, conflict mitigation, and educational programming, grizzly bear recovery remains contested and struggles to gain widespread public support (Alberta Environment and Parks 2016; Gailus 2005; Walton 2006; N. Webb, personal communication, January 20, 2012). However, additional biological or ecological science seems

unlikely to resolve this conflict (Gibeau 2012). Instead, we propose understanding the people expected to live alongside grizzly bears is necessary to inform relevant conservation solutions for people and bears (Clark et al. 2014; Dickman 2010; Madden and McQuinn 2014; Mascia et al. 2003; Nielsen et al. 2009; Wallace et al. 2002).

4.3 Theoretic framing

Grizzly bears hold different meanings to different people, constructed over space and time through individual and social interactions and discourse (Gergen 2015; Gibeau 2012; Mattson 2014; McFarlane et al. 2007; Peterson et al. 2010; Richie et al. 2012). Grizzly bears can represent pristine wilderness, ecological importance, and be valued for their aesthetic qualities or tourism potential (Gailus 2010; McFarlane et al. 2007). However, bears can also signify safety risks and incite fear, or be loathed for their potential to inflict negative economic impacts on livelihoods (Kaczensky et al. 2004; McFarlane et al. 2007). Grizzly bears can also symbolize the tensions between wildlife conservation and human values, including issues associated with costs and benefits, equity and governance (Clark et al. 2014; Hill 2015; Hintz 2003; Neumann 2005; Reed et al. 2013).

A social constructionist perspective can help reveal why bears might be loved or reviled, protected or persecuted (Fraser-Celin et al. 2017; Gergen 2015; Goedeke 2005; Hill 2015; Knight 2000; Peterson et al. 2010; Scarce 1998). For example, Scarce (1998) found that gray wolves (*Canis lupis*) and their management represented a healthy ecosystem to some, and a surrogate of government control to others across the western United States. Fraser-Celin et al. (2017) identified that socio-cultural and political factors influence constructions of human-wild dog (*Lycaon pictus*) relationships in Botswana, where conflict represents antagonism between social groups rather than with these animals. Certainly, social constructionism can elucidate how

and why values are constructed for wildlife and their management, but also how these constructions relate to points of contention or consensus (Fraser-Celin et al. 2017; Goedeke 2005).

We applied this theory as an overarching lens to our study, whereas the policy sciences social process mapping offered a systematic framework for interpreting interview data relative to the recovery policy context (Clark 2002; Lasswell 1971). The first step in social process mapping is to characterize participants and clarify their perspectives, including constructions of identity, values, and practices relative to conservation policy (Clark et al. 2009; Geertz 1973; Oppenheimer and Richie 2014). As Clark (2002) suggests, "identity lies at the heart of perspectives" (36) and in turn, influences values, which are the enduring, deeply-rooted beliefs or moral qualities people cherish, demand, or expect, ordered by relative importance that guides behavior (Clark et al. 2014; Hitlin 2003; Manfredo et al. 2017; Rokeach 1973). These values include power (autonomy, decision-making), enlightenment (information, knowledge), wealth (production, distribution), skill (competency, expertise), well-being (safety, health), respect (recognition, appreciation), affection (friendship, trustworthiness), and rectitude (integrity, responsibility) (Lasswell 1971; Vernon and Clark 2015). Power can be particularly important, used to fulfill other values and achieve goals for self or four a social group (Clark 2002).

To address the multiplicity of human values, we also borrowed descriptions from wildlife value orientations (WVO) and wildlife attitudes as standardized terminology to help explain the meanings people ascribe to grizzly bears and recovery policy (Chase et al. 2016; Kellert 1996; Manfredo and Dayer 2004; Rokeach 1973). Following Mattson (2014) we condensed WVO descriptions into utilitarian or dominion orientation (use or control over wildlife), mutualistic orientation (egalitarianism or bio-centrism), and distanced or apathetic orientation, with Kellert's

(1996) attitude typology reflecting utilitarianism/dominionism, ecological/scientific, aesthetic, moralistic, and negativistic.

Following this, social process mapping articulates the situations or conditions in which people interact or, in this case, experience grizzly bears, the strategies people use to achieve their goals, and then explicate their value demands and expectations for policy processes (Clark 2002). Lastly, the outcomes and effects of the social process are described (Clark et al. 2009; Clark et al. 2014; Richie et al. 2012).

It is also important to clarify researcher standpoints in social process mapping (Clark 2002; Clark et al. 2014). As primary investigator (PI), CH wanted to understand why recovery continues to be acrimonious, and what people ultimately want for grizzly bears and recovery. CH's interests stemmed from previous work on cheetah conservation in Namibia, Africa, and employment experience in the Government of Alberta's educational outreach and policy analysis sections. As a bear researcher, SN was interested in the contributions a human dimensions approach could add to grizzly bear recovery.

4.4 Methods

First-hand narratives about grizzly bears and recovery were elicited using semi-structured interviews (Deruiter and Donnelly 2002; DiCicco-Bloom and Crabtree 2006; Drury et al. 2010). Participants of interest were those within BMA boundaries rather than major urban centers or tourists, as these people directly shared the landscape with grizzly bears (Bixler 2013; Fikret 2004; Gergen 2015; Kvale 1996). Purposeful snowball sampling recruited diversity across participants, with an initial list including government staff and other interest groups and individuals generated by the province's former carnivore specialist (Noy 2008). This technique helped ensure an acceptable sample size reflecting data saturation (themes, patterns), and was

appropriate given the divisive nature of recovery and reported reluctance of rural peoples' involvement in research (Biernacki and Waldorf 1981; N. Webb, personal communication, January 2012). Participants were contacted using email or telephone and sent study information, and upon agreement to participate, an interview location, date, and time was established (University of Alberta 2016). Face-to-face interviews were preferred, with telephone sessions available if scheduling constraints arose (Novick 2008). At the culmination of each session, participants made recommendations for additional study subjects (Noy 2008).

An interview guide informed by other similar studies and expert input elicited first-hand narratives on perspectives, knowledge, experiences, and strategies towards grizzly bears and recovery policy, including interactions with government personnel (Chamberlain et al. 2012; DiCicco-Bloom and Crabtree 2006; Richie et al. 2012). Interviews were audio-recorded with permission, with written notes taken during each session and extensive post-hoc memoing. Data were continually reviewed throughout the data collection to determine saturation, and interviews ceased when no new information emerged (Fusch and Ness 2015; Golafshani 2003). Alphanumeric codes were assigned during transcription to protect anonymity.

Coding was completed in three phases with an overarching social constructionist perspective informed by social process mapping, and reflective of WVO and attitude descriptions (Clark 2002; Kellert 1996; Lasswell 1971; Manfredo and Dayer 2004). Initial codes were generated by reading and listening to interviews and noting patterns, themes, and dissimilarities (Saldana 2009). Codes were then reviewed, reduced and refined, and entered into Nvivo 10, followed by importing transcripts for final coding (Namey et al. 2006; QSR International Pty Ltd. 2012). Key quotes were extracted to support analysis.

Limitations include possible sampling bias despite attempts to ensure participant diversity, and difficulty specifically recruiting Indigenous participation despite repeated attempts. Of those Indigenous People that did participate, they asked the PI *not* to identify their perspectives as Indigenous given concerns of biasing a broader cultural way of knowing. This presents a data gap and warrants future exploration (e.g., Clarke and Slocombe 2009). We also acknowledge lack of participation from BMA7 (N =1) for reasons unknown and despite repeated attempts, and absence of environmental non-profit perspectives from northwest Alberta, likely due to no known groups operating in the area at the time.

4.5 Results

4.5.1 Participants

67 (of 82) in-person (N =43) and telephone (N =24) interviews (from a possible total of 80 interviews) averaging 80 minutes were completed between end-2012 and early-2014 across BMAs, with no less than four years in a BMA for each, 58 males, nine women, and an average age of 51 (26–72 years). Given the rural context, study demographics may reflect personal preferences for employment by sector (ranchers, foresters) or enculturated norms of gendered roles in rural society.

A single category reflecting employment type was first used to characterize participants, however, further examination of the data revealed shared descriptions from participants in a geographically-bounded way (northwest, southwest), according to BMA (Kreye et al. 2017). Participants used certain terms to characterize their identities, influenced by family history and land use, employment type, educational background, and knowledge and experience with grizzly bears and government personnel. Using participants' own words for naming conventions,

'Homesteader', 'Frontiersman', 'Biologist' and 'Fish and Wildlife Officer' (hereafter 'Officer') emerged (Table 4-1). 'Exurbans' also emerged; however, this characterization was drawn from

Table 4-1 Participant characterization

Homesteaders (ranchers)	9
Frontiersmen (forestry, petroleum, trapper, farmer)	16
Biologists, Officers (government)	31
Exurbans (environmental organizations, residents)	11

literature and reflective of the semi-rural residential areas across some BMAs where participants lived and worked (Rodgers and Pienaar 2017; Schwartz et al. 2012). We acknowledge, however, these characterizations represent a generalized composite picture of interview data and may not account for other possible identities present but did not emerge in this study.

4.5.2 The social process

Interview data reflected participants' culturally-situated beliefs about self and dispositions towards grizzly bears, and how this related to value demands and expectations for recovery policy (Table 4-2). Homesteader (south-BMA5, 6) and Frontiersmen (BMA1 2, north-3) identity reflected a history of land settlement, family and community socialization, and direct experiences with bears and government agencies. Homesteaders identified as southwest Alberta's cattle ranchers, shaping an agricultural history and today's beef-producing economy. Historical influences for the construction of this identity might originate with Alberta's 1872 Dominion Lands Act, which stimulated rapid homesteading and encouraged widespread cultivation of the land for economic prosperity (Bennett and Kohl 1995; Clare 1998; Francis 2011; Gagnon 2016; Government of Canada 2015; Hamley 1992; Martin 1938). Immigrants came from Europe, Britain, and the United States, bringing with their beliefs and traditions influenced by early Christianity's views of dominion over wild nature or Anglo-Texas ranching

culture (Friesen 1987; MacLachlan 2006; Myers and Russell 2003). In the literature, early southwest Homesteaders are described as proud, hard-working people, enduring hardships from

Table 4-2 Participant perspectives denoted by alphanumeric codes

	Homesteader	Frontiersmen	Exurban	Biologist	Officer
Identity	My great-grandfather bought this place in the early 1900s and we've managed to hang on. I love it here. I like the idea I can do a good job raising cattle (P31)	A lot of people in this area have worked out in the bush, in the oil and gas industry. They're a trapper, they've worked in the logging industry (P53)	Most, including myself, have moved here knowing what we're getting into, living so close to wildlife (P63)	Long-term love of carnivores and […] ever since I was ten I've always been pretty fascinated by bears, to learn more about them (P20)	I just figured conservation law enforcement, I wanted to get into law enforcement (P25)
Grizzly Bear Views	These animals, they can tear a door off a bin. People just don't realize that. One swat and they can kill you (P40)	I don't think people really want them shot, but there are some people that say only a good bear's a dead bear (P30)	It's a symbol that nature is still somewhat healthy, the umbrella species concept. I would love to go into nature and know there could be a wild bear (P13)	These animals all have a right to exist […] I would love to sit on the side of a valley and watch a grizzly bear (P11)	We don't want to lose our grizzly bears. They're the forefront, they are the wild right? […] I think we have to make sure our management is clear (P23)
Demands and Expectations	Ranchers here should have the right to protect themselves, their family, their livestock. If a grizzly is on their property we have to protect our families (P40)	How come we don't hear the pros and cons of [industry providing habitat]? Am I defending oil and gas? A little bit. Let's understand the balance. It's such a necessary evil of all our livelihoods (P42)	What the public really wants is to be involved in decision-making […] People want to be more engaged, and feel like their voice is being heard by being part of the decision-making process (P62)	Bears are only the lightning rod to start the conversation and much of this revolves around […] deep-rooted social problems which are all about trust and relationships [and] who gets to be the decision-maker (P62)	Absolutely you'd have a hunt again because you'd have enough bears to support a hunt […] also have the staff to be able to deal with the problem bears (P16)

social isolation and wildlife threats, and this is reflected in study participants' narratives today (Bennett and Kohl 1995). Grizzly bears (and other wildlife) were historically viewed insofar as

they benefitted or burdened people and were subsequently killed for subsistence, revenue, or as problem animals (Burns et al. 2005; Donihee 2000). These "relations of rivalry" (Knight 2000: 3) are still present to some extent, with grizzly bears described relative to where they belong (foothills, forests) or not (ranch lands) and how they affect human wealth and wellbeing (Herrmann et al. 2013; Nielsen 1975).

In contrast, though with some similarities, Frontiersmen of the northwest identified as pioneers of the boreal, with a history of trapping and hunting, forestry or petroleum production, and mixed farming backgrounds. Indeed, the Northwest experienced a similar pattern of historical land settlement and wildlife management, with people seeking a life of prosperity in the bounties of natural resource production (de Mille 1970; Nash 1963). Descriptions of the 'frontier' conjured images of distant borderlands separating civilization from a vast wilderness, and today proud Frontiersmen view themselves as cultivating the harsh and isolated boreal for human use (Clare 1998; Hamley 1992; McCormack and Ironside 1993). Managing wildlife meant killing them to fulfill subsistence needs, generate income, or ensure human or livestock safety (Alberta Fish and Wildlife Division 1990; Forestry, Lands and Wildlife 1990; Provincial Archives of Alberta 2006). Today, people of the northwest link their identity and values to a northern birthright, with boom-bust cycles of forestry, mining, and petroleum production, and expanding agricultural development (Clare 1998; Katerberg 2003; McCormack and Ironside 1993). This has given rise to conceptions of a multi-use, working landscape, with related utilitarian values for bears and other wildlife (Clare 1998; Friesen 1987; McCormack and Ironside 1993; Northern Alberta Development Council 1996).

Specific to values for grizzly bears, Homesteader and Frontiersmen interviews revealed that grizzly bears are still viewed as problem animals requiring management, with perspectives

qualified by experiences including livestock depredation, property damage, and safety risks (Table 4-3). More specifically, Homesteader sentiments reflect feelings of disproportionately bearing the financial and safety costs of living with grizzly bears in a cattle ranching context, whereas Frontiersmen see grizzly bears are impeding industrial development. A potent example of the frustrations felt over grizzly bear protections included the philosophy or practice of 'shoot, shovel, shut up', to manage problem bears or denote policy opposition. That said, contrasting these views were shared positive appraisals for grizzly bears between both groups, reflecting the strength or beauty of bears, particularly sows and cubs, and ecological or existence value. Moreover, Homesteaders and Frontiersmen shared their view of their role as environmental stewards or forest managers, with narratives reflecting their land use practices as provisioning habitat for grizzly bears and helping to increase bear populations.

Exurbans included participants from residential areas and semi-rural communities across BMA2, BMA3, and BMA4 who had diverse cultural and educational backgrounds, employment types, and knowledge and experience with grizzly bears and recovery policy. Exurban identity appeared to be influenced by their beliefs and experiences as migrants or newcomers ('from away') to BMAs, as well as their personal motivations to live or work in BMAs, and broader societal changes in human demographics and land use change (Camino et al. 2016; Manfredo et al. 2017; McIntosh and Wright 2017). For example, changes in the Bow Valley area have shifted historically from ranching to a focus on recreational use and wildlife tourism, and protected areas management (Hildebrandt 1995).

Table 4-3 Values expressed by participants

Power	Officers from 30-50 years ago say they relied on ranchers to take care of over-populated bears. Now we can't do that because we're threatened to be persecuted (P40, Homesteader)	A problem grizzly bear, I'm a little leery of what I say, a bear that's done something should be put down in my eyes. I think putting down certain bears, and not every bear is a good bear, I think if you do actually do the right thing by putting some bears down […] you're gonna save more bears in the end because the public is gonna see that you guys are acting professional, making right decisions (P6, Officer)
Respect	I think anybody who's lived here, particularly in the farming community, they know bears […] have a healthy respect for them, and there might be some of that fear […] they don't want them killing their livestock (P3, Biologist)	The respect I have for grizzly bears more than anything […]I compare them to people all the time […] As I tell people in talks, give them the respect they deserve and they will give it back (P60, Exurban)
Rectitude	[Is it] morally wrong or legally wrong to kill a grizzly bear? People say 'you can't shoot a grizzly bear. Doesn't matter what he's doing' I say give your head a shake […]you wouldn't shoot a grizzly bear that's attacking your kid? (P25, Frontiersmen)	In this community, you have a very high tolerance for grizzly bear populations. People are not into euthanization. [The message is] you can help be part of the solution […] that it's our responsibility to manage, to change our behaviours to the save the wildlife (P22, Exurban)
Wellbeing	We don't have these terrible ranchers down here that want to shoot every grizzly bear […] That's certainly not the case at all. All they want to do is be safe in their area, and not have their cattle all eaten up (P33, Homesteader)	When [people] have a problem, support them so they don't suffer economic losses. If he suffers economically, almost anybody is going to be aggressive towards the animal (P12, Biologist)
Wealth	We'd have no problems if there weren't bears out here. People don't think about who's gonna foot the bill for habitat and mitigation (P38, Homesteader)	It would be more efficient if they lobby the government to subsidize my fencing […] I'm just like anybody else, like just trying to feed myself (P48, Frontiersmen)

Enlightenment	It's a matter of getting this cross-department, cross-government dialogue going […] once you pinpoint those government agencies, get them all together, I think it can work. You just gotta make sure you're partnering with the right people (P9, Biologist)	The BearSmart approach is extremely important [to] long-term recovery. It helps gain public acceptance of bears [and] acknowledge and understand bears and their behaviours, and the human component (P63, Exurban)
Skill	I credit my officers in this because we have rode those guys so hard and made them clean up their act. The number of bear complaints in the oil and gas sites, you could show it on a graph that it's going down (P25, Officer)	These species are on my place and I'm proud of that. I hope I should get credit for that. I don't want the general population saying ranching is bad and beef is bad (P31, Homesteader)
Affection	People love to see great big grizzly bears roaming around, and I can understand that. Absolutely gorgeous animal (P33, Homesteader)	They're just so squishy. I just wanna grab them and hug them. I have a chow-chow dog and she looks like a bear (P14, Exurban)

Regarding human-bear coexistence, the area has become an iconic example (and as reported by Biologists in this study, a bit of a fortuitous anomaly), where people who sought 'a life in nature' generally accept the risks of living with grizzly bears (Bow Valley Human-Wildlife Coexistence Technical Group 2018; WildSmart 2012).

Across Exurbans, values for grizzly bear ranged from fear based on lack of knowledge, to kinship or affection, of which were influenced by different experiences such as hiking encounters, a bear roaming through a person's backyard, or educational or enforcement-related interactions with government personnel. However even if fearful of bears, Exurban interviews indicated a greater willingness to adopt proactive conflict mitigation measures (e.g., bear-proof garbage bins, carrying bear spray) to reduce negative human-bear interactions, and called upon

government personnel to provide additional information and opportunities to learn to safely coexist.

Identities of Biologists and Officers reflected professional affiliation and influences from childhood experiences, personal motivations, or preference for educational and career pursuits. Biologists' bear perspectives reflected ecological, existence, and aesthetic descriptions, whereas Officers reflected public safety followed by the ecological or utilitarian importance of bears. The type of work conducted by Biologists (research, policy) and Officers (investigations, enforcement) also appeared to influence their bear perspectives, mediated by their experiences with bears (fieldwork vs. problem complaint).

As suggested the situations which Homesteaders, Frontiersmen, or Exurbans interacted with government personnel and vice versa, and strategies used to achieve desired outcomes, differed according to the type of grizzly bear interaction (Table 4-4). For example, Homesteaders might call upon an Officer to investigate livestock depredation, Frontiersmen might meet with Biologists to plan access management strategies, and Exurbans interact with government in educational settings. However, a common value demand in these interactions is acquisition or assertion of power, and in doing so, seeking fulfillment or recognition of other values. Depending on how these situations and strategies play out influences whether or not conditions of conflict between people arise. For example, Homesteaders and Frontiersmen valued power insofar as it could gain them respect, demonstrate their knowledge and skill, and pursue wealth and wellbeing.

In terms of grizzly bear recovery, these value demands reflect the importance of personal autonomy and discretion to manage bears free from what Homesteaders perceive as government imposition or unfair persecution. Other value demands and expectations reflect desires for

Table 4-4 Strategies or behaviors employed to help fulfill values

Homesteader	Carnivores can have a place on the landscape. Problems can be solved through cooperative projects (P31)	If I found a grizzly bear, which would be the rural attitude, [I would] shoot, shovel and shut up. I have neighbors that are second-generation on their ranch and that grizzly isn't allowed on their ranch (P18)
Frontiersmen	What happens is they kind of end up buried in a manure pile or somewhere when they hit a farm. Don't ask questions […] just shoot and bury them (P61)	People are in favor to preserve the grizzly and habitat as much as we can. I just think we have to be aware of [people's] needs (P34)
Exurban	I'm pretty impressed with the garbage management in Canmore and Banff. Everyone has bear-proof bins and the residents seem to be very well educated (P54)	We encountered a grizzly and watched it for over an hour […] He knew we were there, we knew he was there, and there were absolutely no problems. Just kind of cool (P22)
Biologist	Distribution of BearSmart materials, getting them in information centers and to county offices […Make] safety in bear country videos, meet separately with each individual sub-division, have more presence at community events (P9)	What we're talking about is a threatened species relative to the need for profit. I guess I would side with the endangered species (P4)
Officer	Everybody's gonna have their own feelings about how you catch a bear, when you catch a bear, or how you process a bear and why, but […] we're actually the people in charge and you need to help us manage properly (P23)	We can make progress. It takes a focused effort […] it takes that one-on-one (P49)

collaborative decision-making processes between government and Homesteaders and Frontiersmen, to ensure peoples' voices are heard and stewardship contributions recognized. Exurbans similarly call for direct participation in recovery policy processes, as well as improvements in government communications and delivery of educational outreach to equip people with the knowledge and skill to live safely with bears. Strategies used by Biologists or

Officers likewise reflect the acknowledgment that participatory policy processes are necessary to advance grizzly bear recovery, however, they too make value demands for power and respect as it relates to legitimacy and credibility to deliver on recovery objectives. These value dynamics are evident between both government personnel and other groups in this study, as well as between Biologists and Officers in relation to who is determined to be the appropriate decision-making authority in what situations (e.g., bear relocation vs euthanasia). As a result, tension exists between government-public relations as well as within agency, contributing to poor communication and trust issues (Clark 2002; Richie et al. 2012).

At the time of this study, the government undertook efforts to engage different interest groups in renewing the 2008-2013 recovery plan, as well as the variable but ongoing implementation of educational outreach, and applied research.

4.6 Discussion

Blending social constructionism with social process mapping and conceptual descriptions from WVO and wildlife attitudes literature, this study highlights the role of identity and the multiplicity of human values for grizzly bears in a contested policy context (Clayton and Opotow 2003; Hitlin 2003; Kellert 1996; Manfredo and Dayer 2004; Rokeach 1973). Ongoing acrimony in Alberta's grizzly bear recovery appears to be rooted in the relationship between identity and values, which are co-constructed through social interactions, historical and current land settlement processes, and direct experiences with bears and government agency (Clayton and Opotow 2003; Fraser-Celin et al. 2017; Hall et al. 2012; Jussim et al. 2001; Knight 2000; Manfredo et al. 2017). In clarifying participants' unique identities, we illuminate why certain values are so salient and as a result, why conflict persists despite shared sentiments towards grizzly bears.

As suggested by Hitlin (2003) identity formation involves emotional and cognitive processes that draw upon "culturally significant symbolic material" (121), linking narratives of self with broader group belonging, and the development of values important to human life (Jussim et al. 2001; Kreye et al. 2017). Our interview data suggest identity and values are co-constructed in relation to lived experiences with grizzly bears and government agency, and broader historical and current narratives shared between family and community (Clayton and Opotow 2003; Knight 2000; Myles and Russell 2003). Depending on group identity and experiences, utilitarian and mutualistic assertions about bears and their management emerge (Clark 2002; Kaczensky et al. 2004; Mattson 2014; Wallace et al. 2002). However, in terms of values, Homesteaders, Frontiersmen, Exurbans, Biologists, or Officers all indicate power and respect are of utmost importance and ultimately reflect the significance of self-expression and determination of one's own fate in policy processes (Kreye et al. 2017; Manfredo et al. 2017; Mattson 2014). Disputes in grizzly bear recovery are therefore less about utilitarian or mutualistic perspectives and rather reflect the conditions of conflict between people vying to fulfill their values and affirm their identity (Hitlin 2003; Kreye et al. 2017).

Whether conscious or not, each sub-group is trying to actualize the same values in recovery policy processes. Rural land users want respect and autonomy to make decisions relevant to their lives, and so do Exurbans, Biologists, or Officers. All actors desire appreciation as legitimate decision-makers in policy processes and seek to assert the power necessary achieve other values like wealth and wellbeing, knowledge and skill (Clark 2002; Scarce 1998; Young et al. 2015). Having power determines how value transactions play out, including if they are equitable and who benefits or who bears the costs (Clark 2002; Lukes 2005). If value transactions are perceived to be inequitable, this can create in-group and out-group conditions

and result in feelings of disadvantage, loss of self-expression and lack of power (Clark 2002; Hitlin 2003; Kreye et al. 2017).

For example, Homesteaders and Frontiersmen reported feelings of unfair persecution by government personnel, portrayals as villains in grizzly bear recovery, and exclusion from decision-making tables (Neumann 2005; Opotow and Brook 2003). From their perspective, rural landowners who once had discretion and encouragement from their government to manage bears must now abide by regulations and restrictions they feel do not secure their wellbeing and wealth (Alberta Fish and Wildlife Division 1990; Burns 2005; Donihee 2000; Kansas 2002; Kreye et al. 2017). Top-down control over wildlife goes against Homesteader and Frontiersmen values for autonomy, and despite government efforts to reduce negative impacts of grizzly bears, rural landowners feel they continue to disproportionally bear the financial and safety costs of recovering grizzly bears (Kreye et al. 2017; Neumann 2005). Government is perceived to place bears' needs above people, with Exurbans shouldering unfair expectations on landowners to coexist with bears. In turn, some Homesteaders and Frontiersmen espouse "shoot, shovel and shut up" to oppose policy (Pohja-Mykra 2016).

However, Exurbans also feel excluded from policy decision-making, with frustrations reflecting demands for improved outward government communication and delivery of educational outreach to address human safety risks and reduce the possibility of bear relocation or euthanasia. Exurbans' positive inclinations may reflect a post-materialistic movement across urbanizing society, as human subsistence needs and traditional lifestyles change, and people reimagine what human-wildlife coexistence means (Bow Valley Human-Wildlife Coexistence Technical Group 2018; Manfredo et al. 2017; Schwartz et al. 2012; Walker and Fortmann 2003). While these demands contrast Homesteaders and Frontiersmen, who seek recognition of their

stewardship contributions and compensation for living with grizzly bears, similarities between groups lie in demanding recognition for who people are and the power to determine one's future.

With government participants, the importance of identity and values reflect power and respect in relation to their credibility and legitimacy as decision-makers in recovery processes. Both Biologists and Officers view top-down management necessary to deliver on long-term bear conservation needs and ensure public safety. However, disputes between these two groups reflect human-human conflict in asserting who is more legitimate, and who has the appropriate knowledge or skills to make bear management decisions (Clark 2002; Hitlin 2003; Mattson 2014). The conflict here is not about bears, it's about people. Despite shared value orientations of mutualism (Biologists, Exurbans) or utilitarianism (Homesteader, Frontiersmen, Officers), or attitudes about bears (from fear and loathing to beauty and affection), conflict is situated around identity-value dynamics, and peoples' involvement in decision-making over policy that affects their lives (Clark et al. 2014; Clayton and Opotow 2003; Mattson 2014). People want to be respected for who they are, acknowledged for what is important to them, and have a hand in what outcomes will come from public policy (Chase et al. 2002; Gibeau 2012; Manfredo et al. 2017). Given this insight, we suggest contextually-specific collaborative approaches that seek to listen and understand people are necessary to address the ongoing acrimony in Alberta's grizzly bear recovery (Chase et al. 2016; Mattson 2014; Reed et al. 2013).

4.7 Conclusions

This study demonstrates the importance of understanding the social process in grizzly bear recovery to address an ongoing and contentious debate. Practically, we recommend establishing multi-stakeholder groups reflective of each BMA, to engage people in decision-making on future grizzly bear governance (Chase et al. 2002; Fikret 2004; Lafon et al. 2004;

Reed et al. 2013; Vucetich et al. 2018). This would help recognize and reflect the socio-cultural and environmental differences across the Alberta landscape, and work to build relations of trust, foster constructive dialogue, provide opportunities for co-learning, and identify common ground (Fikret 2004; Gibeau 2012; Hall et al. 2012; Lafon et al. 2004). Current examples include grassroots action, such as Waterton Biosphere Reserve's Carnivores and Communities Program, Bow Valley Human-Wildlife Coexistence work, and Peace Region's Northwest Grizzly Bear Team. Related to this, we suggest evaluating these collaborative approaches as part of a policy sciences approach.

We also suggest collaboratively developing interactive learning opportunities targeted to the specific needs and values of people across BMAs (Blekesaune and Rønningen 2010; Hughes et al. 2017; van Dalum 2013). This can include hands-on educational opportunities that address human safety concerns (e.g., bear spray training) rather than messaging focusing on saving bears, which may not resonate with all audiences (Johansson et al. 2016; MacDonald 2016). The grassroots groups previously mentioned have demonstrated that tailoring educational messaging and experiences is a useful approach (e.g., WildSmart 2012).

Theoretically, our approach was useful to describe the complexity of human identity and values relative to grizzly bears and their conservation, including using standard descriptions from WVOs and wildlife attitudes (Deruiter and Donnelly 2002; Drury et al. 2011; Mattson 2014). We suggest future research consider these approaches to help uncover complex social phenomenon and inform relevant conservation solutions (Mascia et al. 2003; Rust et al. 2017). We also suggest future research specifically explore Indigenous identity, values, and relationships with grizzly bears, and experiences with policy processes, as this was a gap in our study (Clarke and Slocombe 2009).

Ultimately, involving the people who are affected by policy in decision-making can enable opportunities to assert what is important to them and why, and can work to build better human-human relationships, which we suggest are necessary to improve proclivity to support conservation action (Kreye et al. 2017; Mattson 2014). Grizzly bear recovery processes must ensure the diversity of people who live with these bears are not alienated from policy participation and instead given opportunities to clarify their perspectives, values, demands, and expectations (Clark et al. 2014). While a contextually specific and collaborative policy approach will undoubtedly be challenging to implement, enabling the conditions to fulfill human dignity desires across a socially diverse landscape is necessary for people and bears (Fikret 2004; Lasswell 1971). Doing so is more likely to enable constructive dialogue and outcomes for human-bear coexistence.

5 Persistent problems in Alberta's grizzly bear recovery

5.1 Introduction

Grizzly (brown) bears (*Ursus artcos*) are a Holarctic species once common to the northern hemisphere, including Canada, from the Prairies to Boreal Cordilleran, throughout British Columbia's dry interior to wet coastline, and the subarctic regions of the Yukon, Northwest Territories, and Nunavut (Fig. 1-1). However, the species has been extirpated from much of this historic range given the arrival of early European settlers with their land uses (COSEWIC 2012; McLellan et al. 2017; Nielsen 2005). Today, human-caused grizzly bear mortality is recognized as the single greatest threat to the species' survival across its North American distribution, and notably in Alberta (McLellan et al. 2017; Nielsen et al. 2009). This includes direct mortalities from conflict incidences, poaching or illegal killing, and accidental death (Alberta Sustainable Resource Development 2008).

Past research in Alberta has examined the drivers of human-bear conflict, as well as people's attitudes towards grizzly bears, and their support or opposition to bear conservation (Clark and Slocombe 2011; McFarlane et al. 2007; Richie et al. 2012). However, a dispute continues to persist around the recovery of grizzly bears, with bears no closer to delisting (Coogan et al. 2018; Richie et al. 2012). Increasingly, conservation practitioners recognize the importance of socio-cultural and political factors in shaping proclivity to bear conservation (Clark et al. 2009; Clark and Slocombe 2011; Gibeau 2013). This research, as part of a broader study building upon existing work in Alberta, used a problem-oriented approach to identify different peoples' problem perspectives in Alberta's grizzly bear recovery (Clark 2002; Laswell 1971). Results of this study are applicable to policy design and implementation at a proximate scale and offer broader insights into the human dimensions of carnivore conservation.

5.2 Study context

Grizzly bears are listed as a threatened species in Alberta, protected by a provincial recovery plan that has been nothing short of acrimonious, particularly since the establishment of a controversial hunting moratorium in 2006 (Alberta Environment and Parks 2016; Nate Webb, personal communications 2011). Though Alberta's grizzly bears are valued as a charismatic species symbolizing the rugged beauty of the wilderness; they also represent fear and safety risks and negative impacts to livelihoods (Black 1998; McFarlane et al. 2007). Certainly, the values and attitudes people have towards grizzly bears, and what they symbolize, introduce a level of complexity into development and implementation of recovery policy (Gibeau 2013; Richie et al. 2012). The same is said for the goals and expectations people hold for recovery policy, including the normative beliefs of what people believe the government should be doing (Clark 2002; Laswell 1971). In the case of Alberta's grizzly bear recovery, policy objectives have been largely formulated to address the needs of bears, using available biological and ecological data to craft management objectives (Alberta Environment and Sustainable Resource Development 2008).

Currently, 691 grizzly bears are estimated to roam across more than 170,000 km^2 of western Alberta, where seven demographically-separate Bear Management Areas (BMA) delineate management intent (Alberta Environment and Parks 2016). These areas also contain different intensities of human land use including residential and Indigenous communities, forestry, agriculture, mineral and petroleum industries, and recreational use (Alberta Environment and Parks 2016; Festa-Bianchet 2010; Statistics Canada 2012). These land uses create opportunities for bears and people to interact, including positive and negative encounters, such as wildlife viewing or conflict (e.g., vehicle or train collisions, Alberta Environment and Parks 2016). Oftentimes, conflict results in bear mortality including illegal or accidental killing

(e.g., vehicle collisions, mistaken identity for a black bear), agency euthanasia or translocation (treated as a mortality; Lamb et al. 2016; Nielsen, Cranson, and Stenhouse 2004; Nielsen, Stenhouse, and Boyce 2006). Current recovery policy attempts to address this by setting thresholds for anthropogenic disturbances and guidelines for attractant management (e.g., electric fencing) or educational outreach to raise awareness, develop skills and encourage stewardship (Alberta Environment and Parks 2016). However, policy is implemented by people, and people differ in their views and values for grizzly bears and their "recovery," and so recovery remains a contested topic (Nate Webb, personal communications 2011). Indeed, grizzly bear recovery is potentially even more contested given recent results on population studies and increasing human-bear conflicts (Alberta Environment and Parks 2016; Coogan et al. 2018; Morehouse 2016; Senick 2017). While classical natural science has provided biological and ecological information for bear management, the people-side of conservation remains lacking particular from a problem-perspective in a policy context (Bennet et al. 2017; Gibeau 2013; Madden 2004).

5.3 Methods

Lasswell's (1951) problem-oriented approach offers a useful framework to systematically identify conservation policy problems, including grizzly bear conservation (Clark and Rutherford 2014; Kolhi 2007; Rutherford et al. 2009). Generally defined, a policy problem is a disparity between what people want to happen and what actually does, or is perceived to, happen, as described by the people experiencing them (Clark et al 2014; Redpath et al. 2013). Defining a problem, as suggested by Clark (2002), is "really about the social significance of a situation, its meaning, implications, and urgency" (100). This means policy problems are not the same for everyone, differing in meaning according to socio-cultural, political and environmental

contexts (Primm and Clark 1996). However, these differences have broader implications for policy implementation, including how the problems are framed, what knowledge or whose voice is considered legitimate in policy processes, and public acceptance and adoption of activities (Clark 2002; Clark et al. 2008). Utilizing the policy sciences problem-oriented approach can help uncover different peoples' interpretations, perceptions, and goals for policy, as well as the trends or conditions, expressed through different forms of discourse or narrative that have shaped current contexts (Clark 2002; Laswell 1971; Nie 2001; Reed 2008). In turn, this approach can help to identify possible alternatives to help resolve policy contention (Clark 2002; Laswell 1971). An overview of this process can be found in Clark (2002, 87) and in Laswell (1971), with the approach used in this study described below.

To orient myself to the complexity of this policy problem, I first reviewed the trends and conditions of grizzly bear recovery in Alberta (Clark 2002; Laswell 1971). Available documentation (decision-making, guidelines, scientific publications, online and print reports, and websites) on the listing of grizzly bears and recovery policy was first gathered, and then a document review process was used (see Appendices; Clark 2002). Document review is a common technique used to contextualize multiple sources of information and illustrate decision-making processes that approximate (or not) biological or social goals, as well as provide insight into power and voice in policy contexts (Bowen 2009; Clark and Vernon 2017; Patton 1990).

Following this, participant standpoints, problem perspectives, and goals are clarified (Clark 2002; Laswell 1971). I used qualitative, semi-structured interviewing techniques to gather data first from a from key informant list and then with additional participants via chain referral (Drury et al. 2011; Noy 2008). This process enabled a diverse range of directly-affected people that lived, worked or recreated across Alberta's BMAs to provide their perspectives on grizzly

bear recovery (Vernon and Clark 2017). This approach was particularly useful given the ability to gather first-hand data grounded in participants' own words rather than impose *a priori* categories onto the data (Clark and Willard 2000; Goldman et al. 2010).

Telephone or email was used to contact participants, who were supplied with study and consent information followed by an interview date, time and location once agreement to participate was established (University of Alberta 2016). Face-to-face interviews were preferred, though telephone sessions were made available if there were constraints or limitations in meeting face-to-face (e.g., work schedules; Novick 2008). A semi-structured guide informed by previous work and Alberta-specific questions was used to conduct the interviews, with latitude to explore topics more deeply as they emerged (see Appendices; Bennet et al. 2017; Drury et al. 2011). An iterative process of collection-transcription-analysis was used to determine corroboration and saturation as interviews were completed (Biernacki and Waldorf 1981). This process included comparing and contrasting data to develop provisional descriptions of participant problem perspectives, goals, and possible alternatives (Clark et al. 2008; Rust 2015). Once saturation was considered to be met, meaning no new patterns or themes emerged, data collection ceased (Fusch and Ness 2015). Interviews were then transcribed and re-examined for possible new insights, and, with no new findings, the provisional codes were then entered into NVivo 10 software (QSR International Pty Ltd. 2012). Transcripts fully coded used the software, with any redundancies or co-occurrences in coding condensed or removed as necessary (Namey et al. 2006; Saldana 2009). After all data were coded, key quotes were extracted to help illustrate my findings (Young et al. 2015).

5.4 Results

I first present the trends and conditions, including a condensed timeline of noteworthy events (Table 5-1). I then move to presenting participants' problem perspectives, goals and suggested alternatives to address grizzly bear recovery problems.

5.4.1 Contextual analysis

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. Agricultural expansion, fur trading, timber harvest, and petroleum and mining developments have resulted in habitat change, fragmentation, and loss, as well as increased opportunities for human-bear conflict. Grizzly bears have been killed for their pelts, hunted as a trophy, or illegally poached for body parts. They are accidentally killed in vehicle or train collisions, mistakenly shot as black bears, and purposefully killed as nuisances or pests or to prevent human safety risk. Certainly, human land use affects bear survival, exacerbated by bears' natural behavior and life history traits. That said, grizzly bears can also constrain human wellbeing by impeding industrial resource development, depredating livestock or damaging property, and in rare cases causing human fatalities.

Currently, Alberta's grizzly bears are managed as a threatened species with recovery objectives including completing population assessments in order to understand bear density and distribution to inform recovery achievements; reducing human-caused bear mortality; access management and habitat conservation; educational outreach; and, inter-jurisdictional cooperation to ensure sustainable populations (Alberta Environment and Sustainable Resource Development 2008.

Table 5-1 Condensed timeline of grizzly bear management (Alberta Environment and Parks 2016; Alberta Wilderness Association 2014; Gailus 2006)

1700's to late 1800's	• ~6000 grizzly bears estimated in Alberta. • Grizzlies and Alberta's Native Peoples reported to co-exist, with little hunting. • Fur trading across Alberta throughout 1700s. • Dominion Lands Act (1872) and arrival of Canadian Pacific Railway (1883) see advent of more European settlers, many to southern Alberta. • Reportedly rapid grizzly bear population decline due to unrestricted sport and commercial hunting by settlers (e.g., Nagy 1990).
1900's to 2000	• First legal protection 1927 requiring hunters to register legal kills. However, variable public and government-sanctioned persecution through 1950s as population control mechanism. • 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*." • Grizzly bear research gains prominence across Alberta and other jurisdictions. • 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	• ESCC recommends grizzly bears designated as 'threatened' in 2002, based on "*very small population size (fewer than 1000) and dispersal and exchange with adjacent populations limited*." • Alberta government refuses to act on ESCC recommendations; however, a Grizzly Bear Recovery Team is established by Minister for Sustainable Development, Mike Cardinal. • Draft recovery plan developed in 2004. • DNA studies initiated to estimate populations across BMAs. Estimates indicate less than 700 bears on provincial lands. • ENGO criticism that lack of financing and implementation of 1990 management plan resulted in a dire state of grizzly bears. • Scientists recommend threatened listing. • Public criticism for Alberta Government ignoring precautionary principle yet continues with the spring grizzly hunt.

2004-2008	• Increasing prevalence of scientific research, focusing on grizzly bear biology and ecology, followed by human dimensions. • Foothills Research Institute expands its program into northern boreal. • Independent scientists send a letter to Premier Ralph Klein recommending the government endorse the recommendations of the ESCC. • Public and ENGO criticism for government's lack of action on threatened status. • Legal hunting in 2005 allocated 73 licenses provincially, with 10 filled. • Hunt is suspended in 2006 for a three year period to help address known human-caused mortality. • Alberta hunters upset over how grizzly bear population decline is framed as a hunting problem, and cite considerations for habitat loss, poaching, road kill, and other issues.
2008-2012	• Alberta Recovery Plan approved (2008-2013). • Grizzly Bear Recovery Team dismissed. Despite recommendations, Minster does not endorse numerous regional implementation teams, increased funding or staffing. • DNA studies, including those that engage local landowner expertise. • Scientists recommend government address road density and human access issues. • Recommendations to list grizzly bears as 'threatened' by ESCC, and Minister designates listing. • 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 remains. • Ongoing studies continue indicating human access poses a considerable threat to long-term persistence. • BMA1 and 7 remain data deficient due to funding and staffing issues. • Northwest Alberta grizzly bear committee identifies knowledge gaps and develops an action plan. • Draft access management strategy developed but not publicly released. • Annual recovery status updates are made publicly available. • Waterton's Carnivore Working Group (2011) coordinates community-based projects to reduce human-bear conflict. • Alberta BearSmart program is launched (2011) with variable implementation provincially.

2012-Present	• Recovery plan is reviewed and renewal process is undertaken. • Hunting moratorium is ongoing, as a direct control over known human-caused morality. • Poaching and self-defense account for the greatest mortality sources (47%). • Roads are cited as a major contributor of mortality risk. Draft Access Management Strategy posted is online. • However, industry remains unclear on linear thresholds despite current knowledge on mortality risk, and there is no clear legislation to support access strategy. • Government biologists suggest "social tolerance" to co-exist with bears is at a maximum (no more bears desired), particularly in agricultural areas given human-bear conflict and perspectives of increasing or expanding bear populations. • Widespread calls from interest groups for a re-opened hunt, though ENGOs remain opposed. • June 2016 the draft renewed recovery plan publicly posted for comment. No release date announced for final plan. • Ongoing BearSmart efforts, variable across the province.

However, governance and implementation of recovery policy is nothing short of complex, notwithstanding the changes in re-organization of departments and different names delineating working areas since 2008. Currently, two different government ministries are responsible for delivering on recovery objectives, Alberta Environment and Parks (AEP) and Justice and Solicitor General (JSG) who once were housed in one government department. Even though nuances existed with how bear conservation and management was conducted, it is likely more pronounced now given different reporting lines, and normative perspectives and operational practices on how bears are managed.

For example, Alberta Environment and Parks staff include the biologists, whom have jurisdiction over grizzly bears and can provide input into decision-making on human land use across public lands. Biologists largely deal with bear population and habitat-level decision-making and where capacity exists, delivery of educational outreach. However, there are also provincial parks biologists, who only have jurisdiction across formally protected or recreational

areas, with decision-making largely centering on ecological function, and human-bear interactions and safety. Alberta Environment and Parks staff also include public lands officers, whom largely have the final decision-making authority over activities that are approved on public lands, including those leased by industry, agriculture, municipal, or recreational groups. At times, biologists and lands officers conflict in their perspectives on prioritizing grizzly bear recovery over public land use, creating tensions internal to the department.

Adding more complexity is the separation of fish and wildlife enforcement officers in the Justice and Solicitor General department. This agency has authority over bear management as it relates to "problem animals" dealing with direct human-bear conflict (e.g., livestock depredation, public safety). These enforcement officers have the authority to re- or trans-locate or euthanize bears, and conduct investigations on mortality incidents, with reports shared with government biologists. JSG is also responsible for conducting investigations on livestock depredation, where another agency, Alberta Conservation Association, is responsible for distributing government-funded predator compensation to affected landowners after submitting required claims.

Lastly, the federal government also has management authority in Alberta, though constrained to Jasper, Banff and Waterton Lakes National Parks. Management objectives are to ensure a healthy grizzly bear population and habitat security, manage public safety risks, and provide educational outreach to visitors. Inter-jurisdictional cooperation between provincial and government agencies is important in decision-making and ensuring recovery objectives, though as evidenced by interviews there are differences in how problem bears are defined and managed, as well as values for and commitment to educational outreach.

Other actors on this complex landscape include forestry, petroleum, mining and agricultural (i.e., grazing leases) industries, of which are granted approval to operate and

regulated by Alberta Environment and Parks, as well as recreational users across both public lands and protected areas. By and large, resource extraction companies report on using best practices for linear access (i.e., roads) and attractant management when operating in grizzly bear habitat, and on providing bear safety training and supplies for their staff. Agriculture and recreational uses are different, given that these activities are largely conducted by private landowners or autonomous individuals, though can also follow required guidelines and best practices in, for example, carcass removal or composting and bear safety. However, there are likely wide variances in how these best practices are utilized across BMAs.

Environmental non-governmental organizations also play a role in Alberta's grizzly bear recovery, including advocacy for policy change, assisting or leading on research activities (e.g., population assessments), and implementing educational outreach. Many of these organizations are however located in the central and south-western portions of Alberta, notably in municipal districts in the protected areas (e.g., WildSmart, Crowsnest Conservation Society).

5.4.2 Problem perspectives and goals

Data from 67 face-to-face (N =43) and telephone (N =24) interviews (from a possible total of 80 interviews) averaging 80 minutes in length, with 58 males, nine females, and an average age of 51 were conducted between 2012 and 2014. Participants offered perspectives from a diversity of experiences with grizzly bears and recovery policy, however, all attempts were made to categorize them according to a single category best reflecting their primary livelihood type, as this was how they most commonly experienced bears/policy (Table 5-2). Participants included those employed in natural resource sectors like forestry, mineral or petroleum industries, agriculture, recreation, government staff, and environmental non-governmental organizations.

Table 5-2 Categorization of study participants, reflective of employment affiliation

Category	Total
Government biologists and enforcement	30
Natural Resources (agriculture, energy, mining, forestry, hunter, trapper, outfitter, non-consumptive recreation)	32
Environmental Non-Government Organizations	5

Via chain referrals, some Indigenous participants were identified to participate in interviews. However, there was limited response from the Indigenous People that did participate; I was specifically asked *not* to identify their perspectives as Indigenous. This was due to concerns of possibly biasing or misrepresenting a broader cultural way of knowing grizzly bears, or issues in policy processes. A lack of a robust Indigenous perspective presents a data gap and warrants future exploration into Indigenous Peoples' problem perspectives on grizzly bear or other wildlife conservation policy processes (Bhattacharyya and Slocombe 2017; Clarke and Slocombe 2009). I also acknowledge lack of broader participation from BMA7 (N =1) for reasons unknown despite repeated attempts to solicit participation, and absence of environmental non-profit perspectives from northwest Alberta, though this was likely due to no known groups operating in the area at the time.

Six dominant problem narratives emerged from my analysis, reflecting the overarching perspectives shared across all participants (Table 5-3). Data are organized by major theme, with decision functions largely reflecting intelligence, promotion, prescription and invocation (Clark 2002; Clark et al. 2008).

Table 5-3 Problem perspectives with example quotes

Problem Perspective	Example Quote
Recovery policy terminology is ambiguous, including "recovery" and "problem bear" definitions. The policy also needs to address the specific contexts of each BMA and is currently criticized as too general.	What works in southern Alberta, Eastern Slopes, policy-wise might not necessarily work up in the boreal forests of High Level. Generally, those types of things are one-size-fits-all, and that doesn't work very well. Maybe having some more regional type of regulations might help a little bit. Sure, we have lots of ranchers up against the east slopes and they have grizzly bear problems. They may need to have some regulations around that, but those same regulations might not be even needed or effective up here, where there's maybe one grizzly bear-and-farmer encounter every ten years. To make everybody do certain things because of something that's happening a thousand kilometers away, it's hard for people to accept that. (P53, forestry)
Grizzly bear mortality and habitat concerns are at the fore, including effectively addressing fragmentation and direct and indirect bear deaths; however, the economic impacts from bears and human safety concerns also need to be explicitly considered.	When [bears are] not afraid of us, then its time to do something. It's not like I have a problem with grizzlies if they're minding their business" (P39, rancher).
Differences in normative views on bear management surround recovery policy, including nuances in management philosophies across government departments and other participants (e.g., prioritizing population-level versus individual bear conservation; shoot, shovel, shut-up). Also related to this is considerations for re-opening grizzly bear trophy hunting, and identifying whose responsible for bear management (government, public?).	The biggest problem [is] differences in philosophy in terms of managing bears. [Provincial Parks] is hands-on […] much more tolerant of bears because we've had hundreds of experiences […] Whereas once a bear crosses that [Fish and Wildlife Officer's] line, it's not long before the bear is moved. (P20, provincial parks biologist)
Questions around the efficacy of management actions, including re- or trans-locations, euthanasia, livestock compensation, and educational outreach. Related to a lack of trust in governance system, as well as lack of	I would say there's a high level of distrust, just because politicians definitely have agendas. High-level bureaucrats also have agendas that they want to fulfill…. The guy that I'm thinking of is now an assistant

evaluation and dedicated financing of recovery efforts. Linked to this are the capacity issues and constraints on government staff to implement recovery efforts.	deputy minister… he has a good wildlife background… and so when it comes to land use decisions, you know, often what he says in a meeting is not what ends up happening in the final decisions… I definitely have more faith in the local people that I deal with. (P24, recreational hunter)
Tolerance to coexist, which reflects the variation in different people's perspectives, values, and expectations of living with grizzly bears.	The social issues are a big concern […] there's this dichotomy between living in or adjacent to bear range versus the people that live in cities. They don't bear the cost of living with bears, and so the values on this is that there are significant polar opposites, like bears are everywhere [and] we have enough of them to there's not enough. (P01, biologist)
Changing political priorities, convoluted decision processes, lack of public engagement, and poaching incidences of bears or human land use infractions contribute to issues of trust between government and public. Linked to this is skepticism in scientific research, largely from non-government participants.	I think there is money in sensationalized research, and if there's no problems there's no money to fund research. So to create research you need to create a crisis […] If you're being funded by the grizzly bear fund, protect the [fund]. There's a certain political pressure that goes with that. (P42, petroleum industry)

These decision functions refer to: the information/knowledge that considered in recovery policy including whose knowledge has influence; recommendations about how to use this information/knowledge and mobilizing action; clarification and establishment of the goals, rules and norms by which people will operate; and, the actual efforts to act, as well as identification of accountabilities in policy outcomes (Clark 2002). In turn, these problem perspectives and their decision functions reflect the ordinary (technical, content-related) and constitutive (normative governance-related) decision processes to varying degrees (Clark 2002). While these problem perspectives are discreetly presented, for sake of comprehension, the boundaries between problems and decision-making processes are blurred and overlapping, where one aspect feeds into or stems from another (Clark 2002).

The term "recovery" was either unclear or interpreted differently by participants. From a biologist's perspective, recovery meant halting the decline of bears by addressing survival threats and securing habitat. However, other extractive users of the landscape, like ranchers or industry personnel, questioned the ambiguity of the term including the ability to measure recovery at a population level when comparative baseline data was lacking. This contributed to skepticism in scientific research to help resolve problems and pitted local sightings information or experiences with bears against western scientific methods of population data collection and analysis. One petroleum industry participant (P42) commented: "*there's money right now doing research for bears promoting threatened species and David Suzuki kind of stuff, sensationalize everything*" while a forester said, "*they are the most visibly threatened species*" (P43). In turn, government participants suggested the public's lack of comprehension of scientific and decision-making processes needed to be addressed, and yet other participants might criticize this as a technocratic and superficial solution. That said, government staff also indicated their skepticism in political will to implement recovery efforts, as indicated by a biologist (P03): "*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*."

Other problem perspectives related to a 'cookie-cutter' policy that lacked contextually specific information at each BMA level to account for variation not only in bear habitat needs and morality concerns but importantly human communities and land uses. All participants share this perspective, to some degree. However, non-government participants, and more specifically those in forestry, industry and agricultural sectors, criticized recovery policy as catering to an urban, biocentric or moralistic perspective on grizzly bears, and did not address the realities of

rural life with a potentially dangerous carnivore. Added to these rural frustrations were perceptions of devaluing their local knowledge about bears rather than using this information to inform policy.

Across government staff and most other participants, the definition of a "problem bear" varied according to a participants' educational background (e.g., biologist, forester), their personal comfort to be in close proximity to bears, previous experiences with bears, and perception of management effectiveness to deal with "problem bears." As suggested by an NGO staff (P15): "*I think the problem bear is very human-centric. They may not be a problem if we weren't there. But in our [organization's] terms, a problem bear would be any bear that is resulting in us feeling like our safety is at risk… I come at it with a biology background and lots of interactions with our local fish and wildlife [officers]… What the public consider a problem bear, is any bear that's in town*." Specific to agriculture participants (ranchers, farmers) the colloquial phrase "shoot, shovel, shut-up" was used to symbolize how landowners "*take care of business*" (P39) with regards to problem bears. That said, government staff did refer to agency-accepted vernacular and management direction in the *Grizzly Bear Response Guide* (2016) on what constitutes a "problem bear" and steps to dealing with one.

Normative problems reflected broader philosophical differences between government staff (biologists, lands, enforcement) and other participants (ranchers, forestry, recreation, NGO). This included perspectives on how bears should be managed (individual versus population-level), disputes in jurisdictional responsibility for bear management (parks versus public land), and the utility or practice of certain management actions (re- or trans-location, euthanasia, aversive conditioning). One government

biologist (P12) said: "*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*." These also linked to efficacy and feasibility issues in managing a large carnivore, given costs associated with the investment of staff time and moving bears, and public safety expectations.

Government participants also generally perceived that the broader public's lack of willingness to accept the costs of living with grizzly bears, like limitations on industrial developments for habitat conservation or voluntarily implementing attractant management, was at the root of recovery problems. Conversely, natural resource and NGO participants indicated frustration with a lack of regulatory clarity by the Government of Alberta on bear population targets and access management thresholds, as well as a lack of improving the predator compensation program, providing subsidies for conflict mitigation, or delivery of educational outreach. As suggested by one interviewee (P07), "*there's less tolerance to wildlife values and conservation […] if you're a landowner, [a] farmer, then you're going to be dealing with grizzly bears from maybe an economic perspective, certainly a safety perspective*."

In terms of educational outreach, Alberta BearSmart was recognized as the government's banner program but was reported to be poorly funded, lacked coordinated governance, and was too broad in application. Government staff indicated this work was commonly treated as side-of-desk or nice to do, despite clear policy objectives or staff desire to implement. Adding to these challenges was a lack of evaluation to understand the effectiveness of educational programming on recovery. As suggested by one biologist (P03) "*part of the problem is, [and] it always happens with information and education types of programs, is they're nebulous from a political standpoint. Why would we put money into that? Why would we put resources into that? It would*

be nice to be able to […] convince senior management or those in charge of budgets that these are valuable programs."

In part, educational outreach was not prioritized due to government staff capacity and constraints in the job, due to budget cutbacks and uncertain financial futures, attrition, agency reorganizations, or new political direction. These challenges were also suggested by the government to contribute to slower response times from enforcement officers given additional workloads, staff stress and burnout, and public confusion over who has bear management jurisdiction and so who does one call? Non-government participants also recognized this problem, as indicated by a recreational hunter (P61): "*we need a lot more officers […] there's just not enough of them around" and indicated that "the demands for the officers' time have increased, but the officer [numbers] just haven't*."

Lastly, tolerance to coexist with bears was contested conceptually and practically by all participants, to some degree. As one rancher (P33) said, "*you certainly have got more of them and so there's two factors, the human factor as to what point people are going to start encountering them and be mauled and killed [and] the cattle loss factor […] If you were to say how many bears you could accommodate from Waterton going east on the Canadian side of the border to something like Etna, if you had five grizzly bears that's probably plenty. But there's probably at least twenty-five right now in that given area*." This relates to the notion of a "problem bear" and what constitutes human-bear conflict, perceptions on what recovery means relative to population size, and broadly the normative complexity in decision-making on how to prioritize what issues and perspectives in endangered species policy.

5.4.3 Goals

The goals expressed by participants reflected commonly shared principles and differences, including bear-centric or human-centric perspectives on recovery policy (Table 5-4). Natural resource participants desired continued ability to operate in bear habitat, clarity on access management application, financial supports to implement conflict mitigation techniques or improvements in existing programming (e.g., predator compensation), and improvements in government's response to conflict incidences. Government participants, on the other hand, largely held bear-centric goals, indicative of their mandates and philosophical orientations. This included ensuring healthy and sustainable bear populations and secure habitat provincially and providing for public safety. Additionally, the government desired the public to increasingly tolerate coexistence with bears and personal responsibility in mitigating risk from or death to bears. Lastly, environmental non-governmental organizations desired similar outcomes as government, with emphasis on financial investments in educational outreach, proactive conflict mitigation, and policy change.

In terms of problem bear management, opening trophy hunting on grizzly bears was suggested as a form of population and bear conflict control, proposed by agriculture, industry and government enforcement participants, and some biologists. While opening trophy hunting might possibly help target individual problem bears, it was more broadly suggested as a strategy to garner the rural public's support for sharing the land with grizzly bears: "*My guess is politically [a hunt] would be so limited that it would give the perception that we're doing something, but in reality, the numbers would be so low that, ultimately, we're really probably not affecting anything*" (P49).

Table 5-4 Participant goals related to problem dimensions

Problem Dimension	Goals
Ordinary	• Regulatory clarity/certainty, with regards to access (linear footprint) management and recovery criteria • Standardized provincial process for population inventorying to fill data/knowledge gaps
Constitutive	• People want to be safe and ensure/protect their livelihoods • Trust, reciprocity, and exchange is strongly desired, including the explicit inclusion of local land users in policy-making and decision processes • Clarity in management accountability, beyond jurisdictional boundaries, to consistently apply problem bear criteria and response, types of conflict mitigation techniques used, funding for educational outreach locally and provincially, staff support (new hires, focused workload)

On the other hand, while NGO participants could recognize why some might advocate for a reopened hunt, they along with biologists likewise suggested the perception issues a re-opened hunt (on a threatened species) would cause, as well as the implementation and monitoring challenges of hunting only "problem" bears.

Common to all participants was a shared desire for improving relationships between different groups built on trust, reciprocity, and exchange.

5.4.4 Proposed alternatives

To varying degrees, all participants shared desires for the following alternatives. Firstly, recovery terminology needs to be clarified and contextual variation across people and bear needs must be addressed. Long-term financial investments for implementing recovery must be secured, including dialogue on what and how to improve compensation, provide incentives or subsidies for human-conflict mitigation as well as financially and logistically support educational outreach. This necessitates that government staffing issues must also be addressed, and in doing so would

contribute to improving efficiencies and effectiveness in management responses as well as government-public relations. Additionally, improvements to educational outreach were advocated by all participants to help address myths about bears and bear safety, clarify policy and regulatory direction, and engage the public in citizen science endeavors. This also related to improving communication issues including transparency and timeliness on recovery achievements.

Lastly and importantly, to some degree, all participants called for collaborative processes that involve locally-affected stakeholders in detailed discussions on developing BMA-specific recovery strategies, of which would reflect social, economic, biological and ecological values and needs (Servillo and Van Den Broeck 2012).

5.5 Discussion

A problem-oriented approach helped articulate why grizzly bear recovery remains a complex and contested policy problem in Alberta (Clark 2002; Laswell 1971). Certainly, understanding how different people define the problems, and whether or not they see their goals being met, can have consequences in policymaking and implementation (Cromley 2000; Primm and Clark, 1996; Richie et al. 2012; Wilson and Clark 2007). While the technical problems are challenging to address in their own right, they are symptomatic of the broader and complex normative problems in policy processes (Clark 2002; Laswell 1971).

Specific to this study, natural resource participants' problem perspectives emerge from feeling disregarded and unsupported by government staff, where their stewardship contributions go ignored, an imposed recovery policy places bears' needs above those of people, and people are expected to shoulder the costs of living with grizzly bears. Compounding these frustrations are a lack of policy clarity on what recovery means, weak regulatory guidance on access

management, little financial commitment for implementation or dedicated staffing to respond to public concerns, and a cookie cutter policy approach. As a result, these participants see grizzly bears as one of the many ways they are losing their autonomy and way of life in a province that once encouraged forestry, petroleum and agricultural developments (Francis 2011). Taken alongside the different normative views on if grizzly bears require recovery, or how bears should be managed, positions natural resource participants against government staff and policy. These perspectives are not new in conservation, as seen with wolf recovery in the western United States or Norway, or caribou recovery in British Colombia or Alberta, Canada (Bixler 2013; Denhoff 2016; Nie 2001; Skogen 2017).

However, these problem perspectives are not limited to natural resource participants. Across government staff in this study, different perspectives on how policy should be developed, who should be involved, who is responsible for implementation, and what should be done, exists between biologists and officers. As discussed in Chapter 3, these normative perspectives and practices can be influenced by professional mandate, and previous educational or other experiences, contributing to the need for understanding different people and their epistemological orientations in policy processes. That said, many biologists in this study and the ENGO participants appeared to agree on the need for additional research on grizzly bear population density and distribution, as well as evaluation on the efficacy of educational outreach, where data could be used to help inform the development of recovery objectives and update the status of these bears. Additionally, government staff and ENGO participants agreed with natural resource participants that recovery policy required greater clarification, and that collaborative processes need to be used to develop contextually-specific BMA plans (Servillo and Van Den Broeck 2012). That said, government staff did suggest that rural landowners and users have a

responsibility to accept or share the costs of living with grizzly bears, indicating a shift in land management practices from inappropriate and outdated ones (i.e., shoot, shovel shut-up). That said, personal autonomy to manage wildlife, to protect life, livestock, and property remains a strong value in Alberta, and is in fact supported in legislation (Alberta Wildlife Act, 2000). ON the other hand, this is increasingly juxtaposed against what appears to be moralistic values for wildlife, held by some biologists and the ENGO staff in this study, and perhaps by the increasing urban and upper-middle class across Alberta – a perspective that sees people as the problem for grizzly bears (Alberta Environment and Parks 2017; Brightman 2017; Cassidy 2017). In turn, this contributes to polarization between the goals rural people (i.e., natural resource sector) has for their wellbeing and livelihoods to that of government staff, ENGO staff, or other members of the Alberta public for grizzly bears. At the crux of this policy problem then, are the differences in what people value, what they want, and how they want to or go about achieving it, and in turn how public policy and decision-making processes can or should deliver on these goals.

That said, participants in this study, particularly those from the natural resource sector, did not indicate they 'hated' bears. While some shared experiences with grizzly bears as pests or serious safety threats, others saw bears as wilderness icons or representations of beauty (McFarlane et al. 2007; Richie et al. 2012). Likewise, some indicated they knew how to use electric fencing to mitigate conflict for example, they just didn't' think they should have to buy it, install it, and maintain it - i.e., endure the costs of living with grizzly bears. Rather, the problem with recovery policy was whether policy processes provided people from a variety of interest groups with the opportunity to share their perspectives on human-grizzly bear relationships, policy needs, and what people want for their future. This includes different levels of and roles in government staffing. The changes for recovery policy, based on participants'

suggestions, therefore reflect a change in how policy planning systems are designed and implemented, from an institutionalized and technocratic approach that elicits information from elites to a decentralized process that engages a broad range of actors in identifying needs and outcomes (Servillo and Van Den Broeck 2012). Certainly, even government staff indicated that recovery policy problems lie in outdated governance processes that perpetuate a lack of trust between different interest groups alongside a lack of bureaucratic willingness to implement recovery action (Nie 2001). So, while addressing ordinary problems are necessary, positive outcomes are unlikely unless the constitutive problems are addressed (Madden and McQuinn 2014). A balance must be found then, between recognizing the importance of peoples' goals and fulfilling recovery objectives for grizzly bears.

5.6 Conclusions

This study demonstrates that grizzly bear recovery remains a contentious issue with strong positions that polarize people. However, clarifying problem perspectives highlights that understanding how people conceptualize a problem is important in identifying a solution space in conservation policy (Clark 2002; Laswell 1971; Primm and Clark 1996). Though recovery policy appears to pit certain participants, or interest groups, against each other in how bears should be managed, there was consensus on improving policy processes and decision-making (Mattson 2014). Quite possibly the most salient recommendation from this study is that implementing collaborative arrangements to engage different interest groups or individuals across BMAs in recovery policy processes may help build or improve relations of trust, reciprocity and exchange (Berkes 2004; Clark et al. 1996; Pretty and Smith 2004; Servillo and Van Den Broeck 2012). Doing so could help foster co-learning, identify capacity-building or technical needs, recruit local champions, encourage stewardship sentiments towards bears, develop relevant conflict

mitigation measures or educational outreach, and improve knowledge, comprehension, and participation in scientific processes (Duke et al. *in prep*; Servillo and Van Den Broeck 2012). That said, these processes often hinge on bureaucratic support for decentralization and collaboration, and given legislative and political norms in Alberta, this may be a significant challenge. Regardless, participatory processes that explicitly include people affected by policy in policy decision-making is necessary for lasting success (Berkes 2004; Gibeau 2013). This includes the need to engage Indigenous Peoples in policy decision-making, as well as in research that seeks to understand their perspectives on policy problems (see Clarke and Slocombe 2009). Indeed, as Alberta's grizzly bear recovery suggests, conservation achievements ultimately rest on society's willingness to coexist with large carnivores (Alberta Environment and Sustainable Resource Development 2008). Engaging *all* people in meaningful decision processes can help tip the scale towards success.

6 Dissertation Conclusions

Grizzly bears, and other large carnivores, certainly share a tumultuous relationship with humans across their global distribution (Dickman 2010; Kellert et al., 1996; Nie, 2001; Rust and Taylor, 2016). Bears symbolize myriad cultural values, beliefs, and traditions, which can influence people's relationships with them, including conservation policy (Clark and Rutherford, 2014). This includes representations of bears as part of the rugged and beautiful wilderness; invocations of primal fear; icons of human dominion over untamed nature; humankind's moral obligations to wildlife conservation; spiritual connections to earth; or, symbols failed policy governance and poor bureaucratic processes (Black, 1998; Child and Darimont, 2015; Hill et al., 2017; McFarlane et al., 2007; Gibeau, 2013). Different people with different experiences, over time and space, will certainly continue to experience bears and construct relationships with them in their own unique way. Understanding this variation, indeed the socio-cultural and political context of conservation action, is undoubtedly necessary to help craft lasting solutions (Clark and Rutherford, 2014; Primm and Clark, 1996; Nie, 2001). This means going beyond top-down policy processes to processes that devolve and share power, fostering respect, open dialogue and co-learning in order to incorporate human perspectives, expectations, and goals in conservation policy (Bennett et al., 2017; Clark, 2002; Laswell, 1971; Nie, 2001).

In Chapter One, I outline my methodological approach, grounded in exploratory qualitative research as a way to collect rich and detailed, first-hand accounts from the people who live, work and recreate across Alberta's BMAs. This approach adds to the growing body of scholarly work highlighting the utility and importance of social science theory and techniques in wildlife conservation, particularly qualitative approaches (Drury et al., 2011). Future work could continue to explore the utility of qualitative research in endangered species conservation policy.

Chapter Two identifies the special place bears occupy in human hearts and imagination, and what this may means for conservation policy. This chapter illustrates that throughout history, bears have reflected a multitude of meanings to people, often anthropomorphized and representative of spiritual connections between nature, humankind and divinity (Black, 1998; Foltz, 2010). More recently, bear symbolism has reflected political debate and the burden or opportunity that conservation policy can impart on people's livelihoods and wellbeing (Knight, 2000; Manzo, 2010; Richie et al., 2012). In our review, we found that the symbolic potency of bears communicated through story has the power to shape human values, attitudes and behaviours as well as proclivity to conservation action (Clark and Rutherford, 2014; Camino et al., 2016; Waylen et al. 2009). Certainly, stories about bears weave between the myth and reality, telling lessons, explaining processes, speaking of origins or other significant life events, which together help people make sense of their relationship with bears and the wider world (Ingold, 1994; Zemmelman, 2012). As conservationists, understanding these constructions can be helpful to policy design, in order to incorporate or highlight synergies between social and biological values and needs for wild species, and explicitly acknowledge the importance of local culture in achieving success (Blicharska and Mikusinski, 2014; Waylen et al., 2009; Wondolleck & Yaffee, 2000).

Future research could seek to "integrate diverse social sciences and humanities' theories and methods in conservation contexts […] to contribute to our understanding of why people value animals" (Echeverri et al., 2018: 60). This may include exploring "how the ecological/environmental dynamics of [a] place are interwoven in its specific history, culture, social and political institutions (Jalais, 2010: 205), to culturally contextualize wildlife species

(Breitenmoser, 1998). These insights can then be used to develop conservation policy that is sensitive to the many different people that coexist alongside wild animals like grizzly bears.

In Chapter Three, the policy sciences social mapping process was used to articulate the importance and influence of the socio-cultural context in Alberta's grizzly bear recovery (Clark, 2002; Laswell, 1971). This chapter highlights the necessity of a contextual understanding, including the historical and current land and wildlife use perspectives, values, and practices, in conservation policy-making. As Jalais (2010) suggests understanding people, or society overall, and their "perceptions of animals or the complex relationships between particular social systems and their deemed natural environments" (pp. 205) is necessary in conservation science.

However, an important perspective lacking in my study is an Indigenous one, on Indigenous People's relationships with grizzly bears and experiences with conservation policy. While I did not specifically set out to exclude or engage any one group or individual, by virtue of chain referrals as the sampling technique few Indigenous Peoples were interviewed. Combined with requests to *not* identify existing perspectives as Indigenous, my data regrettably lacks this important cultural understanding. That said, there are important learnings from existing information shared by Indigenous Peoples in Alberta, which should be explored in more detail. For example, the Pikani Nation developed *The Grizzly Treaty: A Treaty of Cooperation, Cultural Revitalization and Restoration* (2016) identifying ancient and culturally significant relationships with grizzly bears (Pikani Nation, 2016). The *Treaty* identifies conservation measures that resonate with Indigenous Peoples, including ceremonial, ecological, human health, educational, and economic practices that reflect traditional ecological knowledge and importantly, Indigenous People's role in decision-making processes (Pikani Nation, 2016). That said, western science remains the dominant knowledge system to develop conservation policy, with criticism of or

challenges to inclusion of traditional ecological knowledge and practices into mainstream processes (Berkes, 2004; Clark and Slocombe, 2009; Fernandez-Llamazares and Cabeza, 2018).

Future research therefore warrants specific exploration and engagement with Indigenous cultural relationships with grizzly bears or other species, and conservation policy processes. This approach would place Indigenous epistemologies and ontologies at the center of the research process, to critically examine assumptions about what knowledge is, how it is produced, and what is considered "useful" in policy-making, ultimately challenging western scientific beliefs as the only objective science (Simonds and Christopher, 2013; Smith, 1999; Swadener and Mutua, 2008). However, these decolonized research methodologies should include considerations for data collection techniques that resonate with Indigenous Peoples (Simonds and Christopher, 2013). Storytelling is one such example, offering a culturally-appropriate approach that allows "participants to raise delicate issues with a greater degree of freedom than other participative methods" (Fernandez-Llamazares and Cabeza, 2018: 5). In Indigenous storytelling circles, "stories told and the topics under discussion are decided multilaterally" (Fernandez-Llamazares and Cabeza, 2018: 5), to enable a culturally-relevant format to elicit rich data contextualized by Indigenous participants (Berkes, 2004; Fernandez-Llamazares and Cabeza, 2018; Simonds and Christopher, 2013).

Chapter Four then utilizes a problem-oriented approach to uncover persistent problems in Alberta's grizzly bear recovery policy, from the viewpoints of directly affected stakeholders. This work articulates how and why endangered species conservation policy, particularly large carnivores, can be contested. In this study, consensus was shared in developing a collaborative process for developing contextually-specific conservation action at the BMA-level, given the

variation in needs of people and bears across different socio-cultural, land use and habitat, and economic contexts.

One important outcome from this work, combined with Chapter Three, was identifying the need for collaborative policy processes that engage various interest groups in conservation policy. In doing so, I suggest relations of trust and identifying common interests could be achieved, and in turn help address oppositional interactions between people (Clark, 2002; Muntifering et al. 2017). This would be particularly useful when consensus is lacking but ultimately necessary to achieve conservation outcomes, as human-wildlife conflicts are really more about human-human conflicts reflecting the changing dynamics of resource governance and fulfillment of human livelihood and wellbeing objectives (Clark, 2002; Massé, 2016; Neumann, 2005; Primm and Clark, 1996).

However, research to evaluate the effectiveness or impact of collaborative policy processes for grizzly bear, or other conservation policy processes, is required where future studies could use the concepts presented here in their explorations. Additionally, future research may seek to use the *Weapons of the Weak* (Scott, 1985) as an analytic framework to examine contentious human-bear or wildlife relations, including conflict narratives and forms of resistance to conservation policy. With regards to governance systems, future study could look to a strategic-relational institutionalist approach (Servillo and Van Den Broeck, 2012). This could be used to categorize and understand the influence of complex socio-political configurations in policy processes, including aspects like what actors are involved, how and why, what power they have in decision-making, and if reforms are desired, what these are and how they may play out (Servillo and Van Den Broeck, 2012: 54). Doing so may help elucidate how "planning systems embody socio-political characteristics, expressed in compromises of interests and values [that]

favor or constrain specific strategies of specific actors" (Servillo and Van Den Broeck, 2012: 58).

Finally, Chapter Five demonstrates how newsprint media coverage across western North America depicts grizzly bears and their conservation, with a focus on stories originating from or about Alberta and British Columbia bear conservation. This work identifies why it is crucial for conservation practitioners to be involved in how messages are framed, to ensure accurate representation of information to the public readership, to perhaps encourage conservation stewardship sentiments.

While pressures from human population growth, cultural change, economic development and political priorities will undoubtedly continue to change in Alberta, and certainly more broadly across global grizzly (brown) bear range, finding a balance between addressing human values and needs and those of bears is ultimately necessary. It is my hope this study will contribute to these pursuits.

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Appendix A: Ethics

This study was approved by the University of Alberta Research Ethics Board for the project entitled “Trends in Grizzly Bear Conservation”, No. Pro00028845, August 7, 2012. Participants were made aware of my role as researcher and employment with the Government of Alberta. Every effort was taken to ensure that any sensitive data collected was analyzed and discussed in a manner that would not incriminate participants. Informed consent was obtained from participants through written documentation and verbally. Where consent was given, interviews were audio-recorded and transcribed, otherwise detailed handwritten notes taken and transcribed. Key quotes used in this dissertation were attributed to participants by alphanumeric codes to ensure anonymity.

Appendix B: Semi-Structured Interview Guiding Questions

- Can you please tell me your current age? How long you have lived here? What is your current employment/time in position? Why did you choose this career/path?
- Can you tell me what you know about grizzly bears? E.g., their behavior, reproduction, habitat needs, etc.? Is there anything you would you like to know more about? Can you tell me where or how you learned this? Can you explain how and why this is important to you?
- What are your experiences in Alberta with bears?
- What does the term "problem bear" mean to you? What do you think others think it means? What do you think should happen to problem bears / what do you want to happen? What does human-bear conflict mean to you? Why do you think it occurs? Examples? Can you describe the most common example of conflict you have or do experience? Where does conflict most often occur? Do you think there is a threshold of human presence in bear habitat, where conflict occurs and if so/not why?
- How are incidences handled? Examples? What do you do specifically? Why? What are the results?
- How do you think conflict effect bears and is this/not important and why? Do you see challenges with human land use and grizzly bear conservation and if so/not why?
- What can be done to reduce or mitigate conflict? Whose responsibility is it and why? What will happen if it's not resolved? Is this important? Why?
- Can you explain your understanding of grizzly bear management in Alberta? How effective do you think this is and why? Whose responsibility is it to manage bears and

why? How effective do you think bear management is, is it working for you, for bears? Why/not?

- In your perspective are there differences in bear management provincially and if so what are they? If not do you think there should be any? What and why?
- What do you know of the current recovery policy and historical bear management (e.g., status, population estimate, habitat, etc.)? What do you know of re- / translocation of bears? Access management? BearSmart? Agency control? Hunting moratorium?
- Can you tell me how you feel towards bears? Why do you like them? What makes them special to you/examples? Can you share one of your most memorable experiences?
- How might place a person lives/history in a location/employment/age/gender/culture heritage/media effect views or relates to bears? Anything else? Do you think people want bears on the landscape and if so/not why? Where are people likely to tolerate bears?
- What does the term ‘co-existence’ mean to you?

Appendix C: List of Sources or Literature Used in Document Review

Note these documents are also in References.

- Alberta Fish and Game Association position paper on grizzly bear hunting (http://www.afga.org/issues-grizzly-bear-hunting.html).
- Alberta Grizzly Bear Recovery Plan 2008–2013.
- Alberta Grizzly Bear Recovery Draft Plan 2016.
- Alberta's Grizzly Century (http://www.albertaviews.ab.ca/issues/2005/dec05jan06/grizz.pdf).
- Alberta Outdoorsmen Forum. *Hunting Discussion* 2007. (http://www.outdoorsmenforum.ca/)
- Alberta Wilderness Association Grizzly Bear information (https://albertawilderness.ca/issues/wildlife/grizzly-bear/)
- Applied Conservation Ecology Lab (ACE) Grizzly Bear Publications (http://www.ace-lab.org/publications.php)
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- Foothills Research Institute (fRI) Grizzly Bear Program publications. (https://friresearch.ca/program/grizzly-bear-program)
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- Government of Alberta Grizzly Bear Recovery Plan materials (http://aep.alberta.ca/fish-wildlife/wildlife-management/grizzly-bear-recovery-plan/default.aspx)
- Government of Alberta’s *Wildlife Act: Revised Statutes of Alberta 2000, Chapter W-10* (2014).
- Government of Canada Species at risk Registry COSEWIC Status Report on the Grizzly Bear *Ursus arctos* in Canada (http://www.registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=2459)
- IUCN Red List of Threatened Species: *Ursus arctos* (http://www.iucnredlist.org/details/41688/0)
- J. Gailus (2006) *The Grizzly Manifesto: In Defense of the Great Bear*.

- Kansas, J. L. 2002. *Status of the Grizzly Bear (Ursus arctos) in Alberta*. Wildlife Status Report No. 37, Edmonton. Accessed March, 10 2015. http://dx.doi.org/10.5962/bhl.title.114294.
- Kolhi, J. K. "Stakeholder Views on Grizzly Bear Management in the Banff-Bow Valley: Before-After Q Methodology Study." Master's Thesis, University of Victoria.
- Richie, L., J. D. Oppenheimer, and S. G. Clark. 2012. "Social Process in Grizzly Bear Management: Lessons for Collaborative Governance and Natural Resource Policy." *Policy Sciences* 45, no. 3: 265–291.
- Rutherford, M. B., M. L. Gibeau, S. G. Clark, and E. C. Chamberlain. 2009. "Interdisciplinary Problem-Solving Workshops for Grizzly Bear Conservation in Banff National Park, Canada." *Policy Sciences* 42, no. 2: 163–187.

Appendix D: Keywords used in Media Content Analysis

(brown bear, grizzly bear)

(governance)	**(human-bear conflict)**	**(land use)**	**(bear science and research)**
Policy/Plan/Strategy	Conflict	Industry	Biology
Government	Kill/killing	Oil and Gas	Population
Stakeholders	Euthanasia	Forestry	Individual
Social justice	Translocation	Mining	Habitat
Benefits	Hazing	Operations/Operators	Loss
Economy	Attractants	Recreation	Fragmentation
Politicians	Garbage	Off-Road Vehicle	Degradation
Bureaucracy	Agriculture	Tourism	Food
Legislation	Livestock	Outfitters	Species at Risk (Act)
Regulation	Crops/Silage/Grains	Horseback	Endangered/
Enforcement	Bee Yards	Camping	Threatened Species
Management	Mauling	Cycling	IUCN
Threatened/species	Threat	Residential	COSEWIC
Endangered/species	Attack	Agriculture	Education/Outreach/
Environmental non-	Stalk	Livestock	Information
governmental	Property/damage	Crop/Silage/Grain	Climate
organization (ENGO)	Predation	Access/Management	Persistence
Responsibility	Arrest		Extirpation
Aboriginal/First	Fine/Ticket		
Nations	Captivity		
Hunt/ing	Trespassing		
Access	Access		
Rights	Hunt/ing		
Municipal	Education/Outreach		
Best Practices	Report/ing		
Tolerance	Persecution		
(social/public)			

Appendix E: Media Articles from Source Location

	USA	National	British Columbia	Alberta	Total
Airdrie Echo	-	-	-	1	1
Alaska Dispatch News	16	-	-	-	16
Banff Crag and Canyon	-	-	-	111	111
Calgary Herald	-	-	-	288	288
Calgary Sun	-	-	-	126	126
Canmore Leader	-	-	-	105	105
Cochrane Times	-	-	-	8	8
Cold Lake Sun	-	-	-	1	1
Crowsnest Pass Herald	-	-	-	9	9
Crowsnest Pass Promoter	-	-	-	5	5
Drayton Valley Western Review	-	-	-	6	6
Edmonton Journal	-	-	-	153	153
Edmonton Sun	-	-	-	77	77
Edson Leader	-	-	-	5	5
Fort McMurray Today	-	-	-	29	29
Fort Saskatchewan Record	-	-	-	1	1
Grand Prairie Daily Herald-Tribune	-	-	-	84	84
High River Times	-	-	-	1	1
Hinton Parklander	-	-	-	19	19
Mayerthorpe Freelancer	-	-	-	5	5
Missoulian	2	-	-	-	2
Nanton News	-	-	-	9	9
Peace River Record Gazette	-	-	-	1	1
Pincher Creek Echo	-	-	-	16	16
Spruce Grove Examiner	-	-	-	3	3
The Globe and Mail	-	73	-	-	73
Vancouver Sun	-	-	124	-	124
Vulcan Advocate	-	-	-	1	1
Whitecourt Star	-	-	-	6	6
	18	73	124	1070	1285