DISSERTATION

# GROUP-LEVEL SOCIAL INFLUENCES FOR CARNIVORE RESTORATION AND MANAGEMENT

Submitted by

Mireille N. Gonzalez

Department of Human Dimensions of Natural Resources

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Doctoral Committee:

Rebecca Niemiec

Kevin Crooks
Tara Teel
Mike Quartuch
Cynthia Jacobson

ABSTRACT

GROUP-LEVEL SOCIAL INFLUENCES FOR CARNIVORE RESTORATION AND MANAGEMENT

In this dissertation, I conducted research on how perceptions of the group level of the social system influence individuals' perspectives and behaviors related to carnivore restoration and management (CRM) in the U.S. American West. Using the case study of gray wolf (*Canis lupus*) reintroduction in Colorado, I explored three aspects of the group level of the social system. After nearly 80 years since their extirpation, environmental organizations advocating for wolf recovery introduced a ballot initiative (Proposition 114) that mandates Colorado Parks and Wildlife, the state wildlife agency, reintroduce wolves into Colorado by December 31st, 2023. In November 2020 Proposition 114 passed with about 51% of the votes (Colorado Election Results, 2020), marking the first ever U.S. reintroduction of an endangered species via a ballot initiative. In my first chapter, I used public survey data to explore how intragroup perceptions, or how perceptions of a group one identifies as belonging to, influenced individual and collective civic actions related to wolf reintroduction. I found that social norms influenced intended voting for Proposition 114 and plans for those individuals that opposed reintroduction to engage in collective action against reintroduction. In my second chapter, I used stakeholder interview data to examine perspectives of what would make a stakeholder engagement process, that brings together conflicting stakeholders to collaboratively build recommendations for wolf restoration and management, successful. Stakeholders expected that the process should be representative, transparent, and actively inclusive and that it should foster two-way dialogue. Additionally, to be considered successful, they believed it should achieve the social outcomes of conflict reduction,

social learning, increased trust in agency, and increased support for the management plan. Lastly, in my third chapter, I used stakeholder interview data to examine how perspectives of the outgroup, or a group one does not identify as belonging to, influence social conflict about wolf reintroduction. I found that conflict was fueled by perceptions that the outgroup is unjust, misinformed, homogenous, and unmalleable. Overall, my dissertation expands our collective understanding of the multi-scalar influencers to human behavior that affect carnivore restoration and management. Based on these findings, I recommend how to develop interventions and stakeholder engagement that can help achieve desired social outcomes related to CRM objectives.

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# INTRODUCTION

## Background

In the 21st century we have witnessed a rapid increase of devastating and polarizing environmental challenges (Chan et al., 2020). In particular, there has been a severe decline of biodiversity over the past several decades and research suggests the rate of extinctions will only increase by 2100 (Johnson et al., 2017). Identifying effective wildlife conservation strategies is a critical component of addressing biodiversity loss (Johnson et al., 2017; Manfredo et al., 2017; van Eden et al., 2018). Large carnivore restoration and management (CRM) may be a particularly important wildlife conservation initiative (Venumière Lefebvre et al., 2022). Research suggests that large carnivore populations can lead to improved ecosystem health and enhanced biodiversity (Beschta & Ripple, 2009), and that they potentially mitigate climate change impacts (Ripple et al; 2014; Schmitz et al., 2014) and zoonotic disease transmission (Packer et al., 2003). Yet, conserving carnivores on human dominated landscapes is made challenging by political and social strife and divisive public discourse about management initiatives (Chan et al., 2020; Hartel et al., 2019; Treves et al., 2006; White et al., 2009; Venumière Lefebvre et al., 2022; Zhang et al. 2007).

Human-carnivore coexistence, defined as the "co-occurrence of sustainable carnivore populations and human endeavors with minimal human-carnivore and human-human conflict" (Venumière Lefebvre et al., 2022, p. 8), is a critical component CRM, as is understanding related public perspectives and behaviors. Some individuals perceive carnivores as posing a threat to livelihoods, human safety, and property (Hartel et al., 2019; Lischka et al., 2019). Others believe carnivore restoration is critical for environmental health and, for some, it is a moral pursuit

(Niemiec et al., 2022). Individuals' perceptions of carnivores often influence their relevant civic behaviors, such as voting, donating, and volunteering. Moreover, individuals' perspectives and behaviors can influence carnivore management policies, such as which species are protected, reintroduced, or hunted (Carter & Linnell, 2016; Niemiec et al., 2020a). Individual behaviors, such as urban residents bear-proofing garbage containers (Lischka et al., 2018), and institutional actions, such as the conversion of habitat for agriculture or industry (Macon, 2020), can directly influence human-carnivore interactions and the distribution and health of carnivore populations (Fritts et al, 2003; Niemiec et al., 2020a; Zinn et al., 1998). Furthermore, conflicts with carnivores, such as depredations, can result in lethal control or retaliatory killings (Carter & Linnell, 2016; van Eden et al., 2020; Woodroffe & Ginsberg,1998). These direct impacts to carnivores, paired with indirect impacts such as habitat loss and fragmentation, urban sprawl, and reduced prey populations (Bruskotter et al., 2017; Crooks et al., 2011), has led to widespread declines in carnivore populations (Bruskotter et al. 2017; Dickman et al., 2013; Ripple et al., 2014; van Eden et al., 2018).

Human-carnivore coexistence is influenced by the level of social conflict between stakeholder groups. Yet, research on human-carnivore conflict typically focuses on direct negative impacts of carnivores to human safety, livelihoods, and recreation as the drivers of this conflict (Dickman, 2010; Frank & Glikman, 2019; Sillero-Zubiri & Laurenson, 2001; Venumière Lefebvre et al., 2022). However, research demonstrates that human-human conflict (i.e., social conflict), such as value clashes (Manfredo et al., 2017) and identity-based conflicts (Lute & Gore, 2014; Madden & McQuinn, 2014) over how carnivores should be managed also drive direct human-carnivore conflict and hinder coexistence (Dickman, 2010; Lute et al., 2020; Redpath et al., 2013; Young et al., 2015).

Due to the critical role of public perspectives and behaviors in achieving coexistence, a growing body of literature examines the social aspects of CRM (Carter et al., 2020; Hartel et al., 2019; Lischka et al., 2018; Manfredo et al., 2009). Such work explores individuals' beliefs about the impacts of carnivores (Bright & Manfredo, 1996); the impact of social identity on perspectives about carnivore conservation (Lute & Gore, 2014); the need for managing social conflict about carnivore management (Madden & McQuinn, 2014); and planned and actual voting behaviors on species recovery outcomes (Niemiec et al., 2020a; Niemiec et al., 2022). However, Hartel et al. (2019) noted that these studies are still only a small portion of the overall research on carnivore conservation and management, while Venumière Lefebvre et al. (2022) identified that approximately 31% of the 366 articles in their systematic review of human-carnivore coexistence literature explored the social conflict aspect of coexistence.

**Literature Review**

I contribute to this literature by investigating drivers of the perspectives and behaviors that dictate CRM to identify pathways to foster human-carnivore coexistence. I use a systems thinking approach because it acknowledges that biodiversity conservation is riddled with uncertainty and complexity and is multi-scalar, with interactions across temporal and spatial scales and between the environment and society (Cundill, 2011; Davila et al., 2021). Coexistence is a system of dynamic social and ecological interactions over space and time, yet research primarily explores the ecological component in isolation from the social component (Hartel et al., 2019; Venumière Lefebvre et al., 2022). Thus, investigating the social aspects of the coexistence system is my key contribution.

Human behavior itself is influenced by, and embedded within, a complex multilevel and dynamic system (Lischka et al., 2018; Manfredo et al., 2014). Manfredo et al., (2014), for

example, suggest that human behavior is influenced by three hierarchical categories: 1) the individual level, where an individual's cognitive processes influence their behaviors; 2) the group level, where social affiliations and self-categorization into groups drive individuals' behaviors; and, 3) the institutional and structural level, where external factors, such as political structures, ecological conditions, and modes of economy, influence individuals' behaviors. Similarly, Lischka et al. (2018) propose human behavior is embedded in a social system comprised of four levels, with three external levels that influence the individual. The broadest level affecting human behavior is *society,* which represents the context in which people live, such as language, culture, and migration patterns. Behavior is also influenced by *institutions*, the broad governance structures within societies such as policies, power dynamics, societal norms, and decision-making authorities. *Groups* are the smallest unit of external influence in Lischka et al.'s (2018) four levels; research suggests that individuals self-classify into certain groups and such group classification can influence behavior through group-level norms, attitudes, and behaviors. Lastly, *individual behavior* is the expression of these external societal influences and individual attributes such as values, attitudes, emotions, and socio-demographic characteristics.

Of studies exploring the human dimensions of CRM, there has been the greatest emphasis on understanding factors within the individual level described in Manfredo et al.'s (2014) and Lischka et al.'s (2018) social system (Dickman et al., 2013; Manfredo et al., 2014). This research prioritizes the examination of psychological drivers of behavior, such as an individual's values, attitudes, beliefs, and knowledge about a given issue, as well as their demographic characteristics (Manfredo et al., 2014). For example, Kellert (1985) found that beliefs about the threat of wolves to human wellbeing and to human endeavors led to negative attitudes while beliefs regarding wolves' similarity to humans and their intelligence led to positive attitudes towards wolves.

Additionally, Bright and Manfredo (1996) identified that symbolic beliefs regarding wolves' intrinsic value and their right to exist on the landscape were significant predictors of attitudes toward wolves.

Such research typically utilizes psychological models such as the value-attitude-behavior cognitive hierarchy model (Manfredo et al., 2008; Vaske & Donnelly, 1999). In this model, values represent core enduring beliefs formed early in life, and they guide attitudes (i.e., favorable or unfavorable evaluations of objects and topics) and, in turn, behavior (Ajzen and Fishbein, 1980; Manfredo & Bright, 2008; Manfredo et al., 2009). Research has identified two key wildlife value orientations that may be particularly important in guiding individuals' attitudes and behaviors toward CRM. Domination values represent utilitarian perspectives toward wildlife and the prioritization of human wellbeing and endeavors. Mutualist values characterize personal connections to wildlife as part of one's social group and beliefs that wildlife deserve similar rights and protections as humans (Manfredo et al., 2009; 2018; Teel & Manfredo, 2009). Other scholars have employed the Theory of Reasoned Action (TRA), and its extension the Theory of Planned Behavior (TPB), to understand public perspectives and behaviors related to CRM (Martin & McCurdy, 2009; van Eden et al., 2020). TPB still focuses on the individual level, but also integrates group level influences. This theory posits that a person's behavior is determined by their perceived ability to perform the behavior (i.e., their perceived behavioral control), their perception of what others think they should do (i.e., subjective norms, a group level influence), their intention to perform the behavior, and their attitudes and beliefs related to the behavior (Ajzen; 1991; Ajzen and Fishbein, 1980).

Recently, scholars investigating the human dimensions of CRM have begun focusing on the broader levels of the social systems(i.e., society, institutions, groups; Dietsch et al., 2019).

Studies on the group-level have focused on understanding the role of intragroup perspectives, such as social norms, in guiding human behavior. Social norms relate to the innate human need to belong and constitute the formal and informal rules, imposed by an individual's social group, that govern their behaviors (Cialdini & Trost, 1998; Farrow et al., 2017). For example, research suggests norms influence perceived acceptability of lethal management of coyotes and mountain lions in an urban setting (Wittman et al., 1998); backpackers' intentions to use bear-resistant food canisters (Martin & McCurdy, 2009); and Brazilian farmers' attitudes toward, and behavioral intentions to engage in, killing jaguars (Marchini & Macdonald, 2012). Other studies on the group level have revealed how humans rely on group affiliation to define their own social identity (Lute & Gore, 2014). This social identity then shapes individuals' perceptions of a situation, which influences their behavior (Lischka et al., 2018; Manfredo et al., 2014). For example, Lute & Gore (2014) found that individuals' support for CRM strategies and social conflict about proposed management strategies are linked to an individuals' group affiliation.

Studies on the institutional and societal levels have focused on the role of informal and formal rules and laws, governance structures, societal-level norms, and decision-making processes in shaping individual values, perceptions, and behaviors related to CRM (Jacobson et al., 2010; Manfredo et al., 2014; 2018). Research shows that widely shifting sociocultural contexts, such as modernization due to increased economic growth, education, and urbanization, can influence individuals' values toward wildlife (Manfredo et al., 2020). Lischka et al. (2018), identified that institutional rules imposed by wildlife agencies, such as bear harvest laws and ordinances requiring community members to secure their trash receptacles from wildlife invasion, influenced human-black bear conflict. The authors also found that individuals who perceived the wildlife agency as capable and trustworthy were less likely to bear-proof their

garbage while individuals who perceived the agency negatively were more likely to take individual action to secure their trash. These authors pontificated that those individuals with higher trust in the agency believed the conflict reduction goals could be met without their own engagement on the issue while those who did not have trust that the agency was capable believed their personal engagement was needed to reduce conflict.

**Problem Statement**

In this dissertation, I conducted research on how perceptions of the group-level of the social system influence individuals' perspectives and behaviors related to CRM in the American West. Using the case study of gray wolf (*Canis lupus*) reintroduction in Colorado, I explored three aspects of the group-level of the social system. In my first chapter I explored how intragroup perceptions, or how perceptions of a group one identifies with, influenced individual and collective civic behaviors related to CRM. In my second chapter, I investigated perspectives of what a successful stakeholder engagement process, that brings together diverse stakeholders to work collaboratively on decisions related to a CRM initiative, looks like. Such processes are hypothesized as positively influencing perspectives and behaviors related to conservation. Lastly, in my third chapter, I examined how perceptions one's ingroup, of groups one does not identify as belonging to (i.e., the outgroup), as well as perceptions of the interaction between groups, may influence social conflict related to CRM. Overall, my dissertation is meant to expand our collective understanding of the multi-scalar influencers to human behavior that affect CRM. My chapters are as follows:

1. In my first chapter I explored the influence of perceived social norms, which is an intragroup perspective, on planned individual and collective civic actions. Achieving biodiversity conservation and other environmental objectives requires both individual and

collective civic actions that impact broader systems and structures. Though conservation related behaviors are often driven by social norms, little is known about the influence of different norm types on collective actions, rather research typically focuses on individual behavior. I sought to identify the relative influence of perceived descriptive and injunctive norms, compared to individual-level attitudes, beliefs, and other characteristics (e.g., sociodemographics), on planned voting and collective action behaviors related to proposed wolf reintroduction in Colorado. An injunctive norm is the perception of important others' expectations or judgements related to a behavior, while perceived descriptive norms are the perception of what behaviors others are doing. Our results, based on a public survey, suggest that both perceived descriptive and injunctive norms influenced the individual civic behavior of planned voting. Descriptive norms were influential for those who planned to engage in collective civic action in opposition to reintroduction, however social norms did not help predict planned collective action in support of reintroduction. Our findings suggest that harnessing the power of social norms may be important in conservation campaigns, particularly those focused on voting.

2. In my second chapter I explored the expectations stakeholders had for a stakeholder engagement process that brought diverse stakeholders together for building recommendations for Colorado's wolf restoration and management plan. Research suggests that stakeholder engagement is important for conservation and natural resource management decision-making because it can enhance social outcomes such as reduced conflict and increased trust. In this study I interviewed stakeholders external to the stakeholder engagement process as they have the ability to influence public perceptions of the engagement process itself and the resulting outcomes. Thus, it is important to meet

such stakeholders' expectations to obtain widespread support for initiatives. I compared interviewee expectations to a research-based evaluation framework, which included process criteria and outcomes, to identify which evaluation metrics stakeholders prioritized. Notably, interviewees believed the process should be designed to be representative of diverse interests, transparent, unbiased, and to allow participants to influence decisions; expectations which align with the research-based framework. Stakeholders added that the process should be proactively inclusive and allow for two-way communication. Expected process outcomes, that were part of the framework, included reducing conflict, incorporating stakeholder values into management, and enhancing learning. Interviewees further added that the process should lead to increased trust in the management agency and increased support for the management plan.

3. In my third chapter I explored perceptions related to stakeholder conflict about CRM. Here, I explored perceptions of one's own group, perceptions about groups one is in conflict with, and perceptions about the relationship between groups. Research suggests that value and identity-based conflicts, which are common for CRM issues, require repairing intergroup relations before negotiations and consensus-building on how to address the issue can begin, or conflict will only increase. Yet, in the conservation and natural resource management fields, stakeholder processes about such divisive issues typically focus only on negotiations and there is a gap in the literature on how to identify and target the drivers of identity-based conflicts to repair relationships. I interviewed stakeholders engaged in conflict about proposed wolf reintroduction in Colorado and used theories from conflict and peace-building fields to gain insight on the drivers of the conflict to inform reconciliation efforts. We found that all interviewees discussed

perceptions that can fuel conflict between groups. However, interviewees who identified as third parties to the conflict primarily discussed the relationships between those in conflict and engaged in thoughtful perspective-taking, an activity that can help reduce conflict. Conversely, both those strongly in support of reintroduction and strongly opposed to reintroduction described negative perceptions about those individuals they are in conflict with and positive perceptions about their own group. For example, when discussing others, both groups described each other as acting in unjust and unfair ways, as being incapable of or unwilling to change, and as misinformed. When describing positive perceptions of themselves, both those in support and those in opposition viewed their own goals as just and themselves as victims of outgroup members' actions. Based on findings, I suggest various reconciliation interventions that may be useful in reducing the conflict about wolf reintroduction in Colorado.

**The Case of Wolf Reintroduction in Colorado**

Each of my chapters explored a different group-level element of wolf reintroduction in Colorado. Wolves once inhabited most of North America, but as a result of government sponsored predator control programs, paired with diminishing habitat and pray populations, wolves were exterminated from over 95% of their historic range in the lower 48 U.S. states (Bruskotter, 2013; Mech, 2017). After becoming a protected species under the Endangered Species Act (ESA) of 1973, wolves began repopulating the West through natural migration and reintroductions in Western states in the late 20th and early 21st centuries (Bruskotter, 2013; Mech, 2017).

After initial ESA listing, wolves across U.S. states have been delisted and relisted both at the federal and state levels and public policy has seen a 'pendulum swing' between overharvest

and overprotection (Bruskotter, 2013). The public debate over wolves, and the associated changes in management policy, illustrates the polarized views the American populace has toward wolves. Research suggests that wolves have become a symbol of social divides, such as urban versus rural values, and a surrogate of broader societal-level political conflicts, such as perspectives toward states' rights versus federalism and conservative versus liberal values (Niemiec et al., 2020a; 2022; Slagle et al., 2019). Wolf advocates often support their position with arguments of restoring ecological balance and environmental health, that wolf recovery and protection is a moral imperative, and that people should correct past wrongs and make amends with the wilderness (Crooks et al., 2022; Kellert et al., 1996; Niemiec et al., 2020a; 2022). Conversely, those opposed to wolf restoration see wolves as a threat to rural livelihoods and identity, livestock, game species, and people and pets and as a tool of an overreaching government (Kellert et al., 1996; Niemiec et al., 2020a; 2022).

Colorado is an exemplary case of this public policy debate about wolf restoration and management. Wolves were extirpated from Colorado by the 1940's and nearly 80 years later environmental organizations advocating for wolf recovery introduced a ballot initiative (Proposition 114) to reintroduce wolves into the state. In November 2020 Proposition 114 passed with 51% of the votes in support of reintroduction (Colorado Election Results, 2020) marking the first ever reintroduction of an endangered species via a ballot initiative and by a state wildlife agency. Colorado Parks and Wildlife (CPW), the state wildlife agency, is now mandated to reintroduce wolves into the state no later than December 31$^{st}$, 2023. This process from petitioning to include reintroduction on the ballot through the passing of the initiative and development of the wolf restoration and management plan, has been steeped with controversy (Niemeic et al., 2022).

In Spring, 2021, CPW implemented a planning process to reintroduce wolves by the end of 2023. The overall reintroduction planning process included an extensive multi-year and multi-phase stakeholder and public involvement process. This included assembling a Technical Working Group (TWG) of scientific experts on wolf biology and management, who met monthly to develop recommendations for the wolf restoration and management plan. Additionally, CPW selected 15 stakeholders via an open application process from local government, ranching, hunting, environmental, and wolf advocacy groups, as well as a Sovereign Native American nation, to serve on a Stakeholder Advisory Group (SAG). The SAG met monthly, sometimes in coordination with the TWG, to learn and engage in dialogue about management options and develop recommendations for the Colorado Parks and Wildlife Commission to consider. Recommendations developed by both the TWG and SAG were considered by the Colorado Parks and Wildlife Commission, which is the citizen board, appointed by the Governor, that sets state regulations and policies for Colorado's state parks and wildlife programs, and is the final decision-making body. CPW hired a third-party facilitator, Keystone Policy Center, to facilitate the SAG and TWG meetings as well as the public outreach process, which involves a suite of opportunities (e.g., public meetings, town halls, focus groups, online public comment forms) for the agency and facilitators to provide information to and seek input from the public. The final wolf restoration and management plan was published in May, 2023. See figure 1 for a timeline of my data collection for each chapter, embedded within the overall timeline of the ballot initiative and wolf reintroduction planning process.

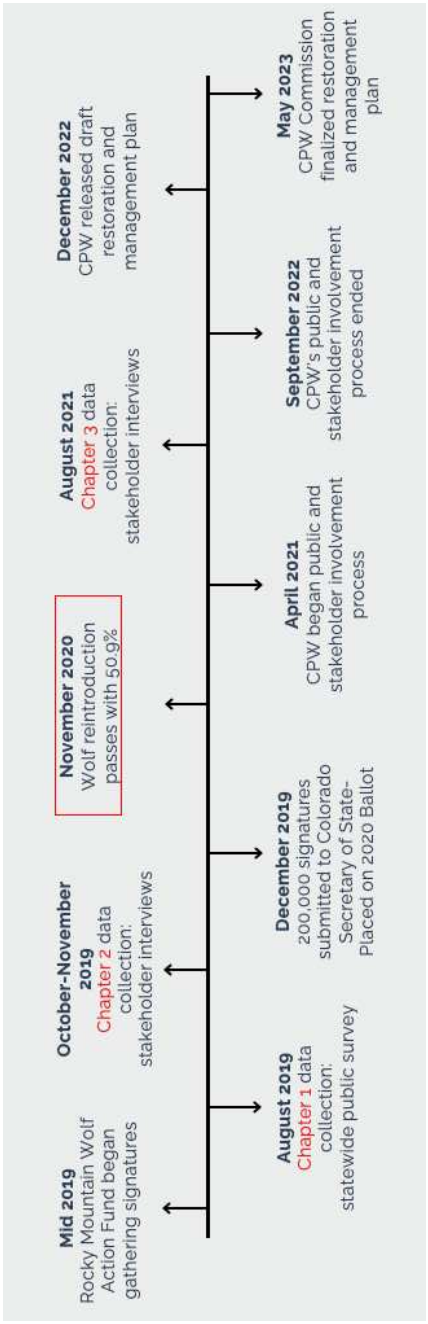


Figure 1. The timeline of my data collection for each chapter, embedded within the overall timeline of the ballot initiative and wolf reintroduction planning process.

# CHAPTER I: THE IMPACT OF SOCIAL NORMS ON INTENDED INDIVIDUAL AND COLLECTIVE CIVIC ACTIONS RELATED TO WOLF REINTRODUCTION

## Introduction

Biodiversity loss is occurring on a scale much larger than individual behaviors can address (Fritsche et al., 2018). This loss is impacted by multilevel societal factors, from local government ordinances to national policies (Amel et al., 2017). Achieving environmental objectives therefore requires civic actions that apply pressure to broader systems to affect wide-scale, rapid change (Adler & Goggin, 2005; Amel et al., 2017). Civic actions are individual and collective actions that address community issues and concerns and shape a community's future (Adler & Goggin, 2005; Gee & Johnson, 2022). Individual civic actions are those that occur in private or by the individual alone, such as voting. In contrast, collective actions are defined as "… participation in public dialogue and activism in both informal and formal social collectives" (Amel et al., 2017, p. 3) and can include sharing information with others, participating in interest groups, and applying social pressure to others (Amel et al., 2017; Jones & Niemiec, 2020; Niemiec et al., 2018). For example, in eastern Washington, collective action in opposition to the lethal management of a wolf pack in 2019 resulted in lawsuits by environmental organizations and a mandate from the governor to modify the state's wolf management strategies (Henderson, 2019; Myers, 2020).

Motivating civic actions for biodiversity conservation requires understanding the barriers to and drivers of such behaviors (Blais et al., 2019; Fieldhouse et al., 2020; Matthes et al., 2018). This insight can help inform the design of outreach and community engagement strategies to encourage civic actions. However, little research has examined the drivers of conservation-related civic actions; rather research on conservation action typically focuses on individual

conservation behaviors such as removing invasive species, preserving habitat, and planting native plants (Amel et al., 2017; Champine et al., 2022; Jones & Niemiec, 2020). This body of research suggests that sociopsychological factors, such as values, beliefs, attitudes, and social norms, can influence individual conservation behaviors (Farrow et al., 2017; Jones & Niemiec, 2020b; Niemiec et al., 2018) and thus may also be important for understanding civic action for conservation causes.

Existing research on civic actions outside of the conservation realm suggests that perceptions of social norms might be particularly impactful (Blais et al., 2019; Fieldhouse et al., 2020; Geiger & Swim, 2016; Matthes et al., 2018). Social norms constitute the informal rules that govern individuals' behaviors (Cialdini & Trost, 1998; Farrow et al., 2017). Such rules are imposed both directly by group members via social sanctions such as exclusion from the group, and indirectly based on individuals' perceptions of others' expectations and judgements (Cialdini & Trost, 1998). The desire to be seen favorably by others often results in individuals' adopting the perceptions and behaviors of their social group (Fishbein & Ajzen, 2010; Rimal & Real, 2005).

Studies have found that, for climate change and some political issues, various normative perceptions can influence voting and collective civic actions. Fieldhouse et al. (2020), for example, found that perceived social norms of those who belong to the same political party was strongly associated with voter turnout. Research on pluralistic ignorance (i.e., a misperception of the number of others who hold a certain opinion) suggests that perceptions of others' opinions of an issue are predictive of engaging in related collective actions, such as discussing the issue with others (Geiger & Swim, 2016; Matthes et al., 2018). This is likely because, as suggested by the spiral of silence theory, individuals are more likely to express their political opinions to others if

they perceive most others hold the same opinion but are less likely to share opinions if they perceive the majority hold different opinions (Geiger & Swim, 2016; Matthes et al., 2018). In their meta-analysis, Matthes et al. (2018) found that 'opinion support', or perceptions of the majority opinion, strongly influenced individuals' willingness to express a political opinion to others and engage in civic actions (i.e., 'opinion expression'). Given such research, perceived social norms about voting may serve as an indicator of others' support and thus influence 'opinion expression' in the form of collective civic actions. However, little is known on whether these normative perceptions influence voting and collective civic actions in the biodiversity conservation context. In this paper, we attend to this research gap by investigating the influence of perceived social norms on voting and collective civic actions related to a carnivore conservation initiative in Colorado, USA.

**Wolf Reintroduction in Colorado**

A ballot initiative to reintroduce wolves, Proposition 114, was brought to a vote in Colorado in the November 2020 election through the efforts of environmental organizations. The initiative passed with 50.9% of the votes in support and 49.1% in opposition (Colorado Election Results, 2020). This mandates the state wildlife agency, Colorado Parks and Wildlife, to reintroduce wolves in 2023. In anticipation of Proposition 114, we conducted a state-wide survey of public perspectives on wolf reintroduction in Summer 2019 while environmental organizations were collecting signatures to place reintroduction on the ballot. Thus, our survey referenced the topic of a ballot initiative but not Proposition 114 itself.

Despite the broader U.S. population's generally positive attitudes towards wolves (Manfredo et al., 2021; Bruskotter, 2013), wolf restoration is notoriously divisive in the American West (Nie, 2001). Survey-based investigations of public response to wolf conservation

have primarily focused on the role of individual sociodemographics, attitudes, values, and beliefs about wolves, management actions, and outcomes of restoration (e.g., Meadow et al., 2005; Pate et al., 1996). However, interview-based and ethnographic research suggests response to wolf conservation is often symbolic of deeper group-level conflicts over urban versus rural values, economic policy, and states' rights versus federalism (Madden & McQuinn, 2014; Nie, 2001). Given this group-level conflict, social norms regarding wolf restoration may be important for understanding relevant public support and behaviors.

**Sociopsychological Drivers of Behaviors towards Carnivore Conservation**

This study builds on literature investigating factors that influence public perceptions and behaviors related to carnivore conservation. Research more commonly explores individuals' perceptions of carnivores and management options, rather than individuals' perceptions of their social group's expectations and judgements related to carnivore conservation (i.e., social norms) (Franchini et al., 2021; Ghasemi et al., 2021; Manfredo et al., 2014). Perceptions can be defined as the ways in which people interpret and evaluate experiences, objects, people, and policies (Bennett et al., 2016). Research on individuals' perceptions of carnivores often explores values, beliefs, and attitudes (Franchini et al., 2021; Landon et al., 2019). Pate et al. (1996), for example, identified that beliefs (i.e., a conviction that something is true; Fishbein & Ajzen, 2010) about outcomes of wolves on the landscape were important for predicting attitudes (i.e., favorable or unfavorable evaluations of an object or behavior; Fishbein & Ajzen, 2010) toward wolves, which in turn predicted individuals' intentions to vote for or against wolf reintroduction. There is mixed evidence on the relative importance of norms compared to these other perceptions in influencing behavior across conservation issues (Bamberg & Moser, 2007), and investigation into the impact of norms on carnivore conservation is especially limited.

There are several sociopsychological models applied in the conservation context that integrate perceptions of norms (St. John et al., 2010). For example, scholars have employed the Theory of Reasoned Action (TRA) and its extension, Theory of Planned Behavior (TPB) (Fishbein & Ajzen 2010; St. John et al., 2010; van Eeden et al., 2020). TRA suggests that a person's behavior is determined by their intention to perform that behavior, which is influenced by their attitudes toward the behavior and subjective norms, or perceptions of important others' expectations or judgements related to the behavior (Ajzen & Fishbein, 1980). TPB contains the added influence of an individual's perceived ability to perform the behavior (i.e., behavioral control, Fishbein & Ajzen, 2010). To illustrate, research has found that norms influenced intentions of farmers to protect biodiversity on their property (Lokhorst et al., 2011), Australian producer's behaviors related dingo management (van Eeden et al., 2020), and perceived acceptability of lethal wildlife management practices (Wittman et al. 1998). To note, since their original definition, Fishbein and Ajzen (2010) now use the term 'injunctive norms' to describe perceptions of others' expectations. Further, the Theory of Normative Conduct (TNC; Cialdini et al., 1991) and Theory of Normative Behavior (Rimal & Real, 2005) use 'injunctive norms' with a similar meaning as 'subjective norms'. As such, 'injunctive' and 'subjective' norms have often been used interchangeably in the literature; in this paper we use the term injunctive norms (Niemiec et al., 2020b).

In addition to injunctive norms, descriptive norms can be strong drivers of behavior (Cialdini et al., 1991; St. John et al., 2010). Descriptive norms refer to how many others perform a behavior (Cialdini et al., 1991). In TNC, Cialdini et al. (1991) posit that injunctive norms motivate behavior because they are tied to expectations, sanctions, and/or approval of others, whereas descriptive norms influence behavior because observing what others are doing can be

seen as “evidence” that it is an effective behavior. Further, descriptive norms serve as mental heuristics to decide how to behave in a specific situation, particularly situations laced with uncertainty. In a study applying TPB, Marchini and Macdonald (2012) found that attitudes, injunctive norms, and perceived behavioral control influenced Brazilian ranchers’ intentions to kill jaguars, but adding perceived descriptive norms increased the predictive power of their model; those who believed others killed jaguars had stronger intentions to kill jaguars. Despite increasing research on the importance of descriptive norms (Farrow et al., 2017), few conservation studies have integrated both descriptive and injunctive norms in the same model (Niemiec et al., 2020b). A meta-analysis of normative influences on conservation-related behaviors identified that, when descriptive norms were included, they had significantly larger effects than injunctive norms and were more often significantly associated with behavioral intentions (Niemiec et al., 2020b). More research is needed on the relative impact of these norms on different behaviors in different conservation contexts (Niemiec et al., 2020b).

**Research Objectives**

In this paper, we address three gaps related to social norms and conservation-related civic actions using the case of wolf reintroduction in Colorado. First, we examined the influence of perceived social norms on intended voting for the proposed ballot initiative versus collective civic actions to address the gap that most studies focus on individual environmental and civic actions rather than collective actions. Second, we addressed the gap that few studies explore the impact of social norms for carnivore conservation specifically. We examined the relative influence of perceived norms compared to the ‘other perceptions’ of attitudes and beliefs and ‘other individual characteristics’ (e.g., sociodemographics). Though perceived social norms are also an individual’s perception, they are perceptions of others’ perceptions rather than of wolves

and their reintroduction. Lastly, we examined the influence of perceived descriptive (i.e., perceptions of how others plan to vote for reintroduction) and injunctive (i.e., perceptions of how important others expect you to vote) norms to explore the relative importance of these different norm types, given that both types of norms may influence behavior but are rarely compared in the same model.

Our specific research questions were:

1. To what extent do perceived descriptive and injunctive norms predict intended voting behavior related to wolf reintroduction in Colorado, compared to other perceptions (i.e., attitudes and beliefs) and other individual characteristics (e.g., sociodemographic)?
2. To what extent do perceived descriptive and injunctive norms impact the intention to engage in collective civic actions (e.g., joining an interest group, contacting a representative, reaching out to others) to influence wolf management in Colorado compared to other perceptions and other individual characteristics?

## Methods

### Statewide Survey

We conducted a statewide survey on Coloradans' perspectives toward wolf reintroduction. Participants, 18 years and older, were surveyed in August 2019 using Qualtrics (Provo, UT), an online survey platform. Our objective was to obtain a representative sample of the Coloradan public, thus we stratified by age and gender to represent the current distributions of demographics in Colorado. We also stratified by region to ensure we captured both urban (Front Range) and rural (Western Slope and Eastern Planes) perspectives given that prior research has noted that perspectives towards wolves often differ by such (Franchini et al., 2021).

We did not stratify by occupation or livelihood (e.g., ranching) because we sought to obtain a representative sample in terms of demographics rather in terms of stakeholder groups.

Our regional strata included the Front Range (35 counties), Western Slope (11 counties), and Eastern Plains (18 counties) (Teel et al. 2003), for which we set a minimum target sample size of 200 per region to attempt adequate samples to compare results across regions (estimates within ±7% at the 95% confidence level; Scheaffer et al., 1996). We obtained age and gender information from the American Community Survey (ACS) estimates, retrieved from the Social Explorer database (ACS, 2017), which showed Colorado had equal population distributions across genders and age groups of 18-34, 35-54, and 55 and older. Though we achieved our target stratification for age and gender, our final sample for region differed from our target because we were unable to obtain 200 responses from the rural Eastern Plains. It was necessary to weight the data to accurately represent the state-level population distributions across the three regions (Vaske, 2019). The population distributions, acquired from the ACS (2017), included: 82.6% of the population in the Front Range, 14.1% of the population in the Western Slope, and 3.3% of the population in the Eastern Plains. The weighting factor for each region was calculated as the population percentage in each region divided by the sample percentage in each region (Vaske, 2019).

We used the services provided by Qualtrics wherein a project manager assists in the recruitment and screening of online survey takers and throughout the data collection process. Participants were not informed of the survey topic before accepting the survey to avoid selection bias. We obtained informed consent by providing a description of the study and asking participants to agree before taking the survey. All aspects of the study were approved by Colorado State University's Institutional Review Board (protocol #19-8942H). See Niemiec et

al. (2020a) which used the same dataset though different questions were analyzed, for an expansion on stratification approaches, participant incentives, Qualtrics methods and limitations, and weighting procedure.

**Measurement**

We included four types of questions in our study: 1) civic action outcome variables, which included intention to vote for wolf reintroduction and intended collective actions to influence wolf management if reintroduction were to occur; 2) social norm predictor variables, specifically perceived descriptive and injunctive norms related to voting for wolf reintroduction; 3) 'other perceptions' predictor variables, which included attitudes towards wolves and beliefs about the outcome wolves in Colorado; and 4) 'other individual characteristics' (e.g., sociodemographics) as predictor variables.

We adapted the voting intention variable from Pate et al. (1996) and asked participants if they would vote in favor or against wolf reintroduction if given the opportunity, measured as 'vote for' or 'vote against'. We included four collective action metrics, derived from Amel et al.'s (2017) spheres of influence model about impacting networks, organizations, and governance processes. These included: join a local group to guide how wolf management proceeds, call or send a letter to a representative about wolf management, discuss wolf management with others, and write material for media outlets (measured on a scale of 1, not at all likely, to 5, extremely likely).

We asked two perceived descriptive norm and two injunctive norm questions. One perceived descriptive norm item asked participants how they thought their family and friends planned to vote, while the other asked how they thought Coloradans planned to vote, both measured as a percentage. One injunctive norm item asked participants how they thought their

family expected them to vote, while the other asked how they thought their friends expected them to vote. The injunctive items had three response options: expect me to vote in favor, against, or not at all; for analysis, responses were binned into: expect to vote in favor or not. These items were modeled after Niemiec et al. (2018) and measured others' expectations following Rimal and Real's (2005) definition that injunctive norms refer to the extent to which individuals perceive that influential others expect them to behave in a certain way, and by implication, social sanctions will be incurred if they do not. We separated the social norms items by reference group due to suggestions that the impacts of norms may vary based on perceived similarity of reference groups (Goldstein et al., 2008).

Our attitude and belief items were adapted from Pate et al.'s (1996) and Bright and Manfredo's (1996) studies of perceptions of wolf reintroduction in Colorado. Our attitude item asked participants if their general attitude toward wolves was positive, negative, or neutral (measured on a scale of 1, extremely negative, to 7, extremely positive). Our aim was to explore how the attitude toward the target (i.e., wolves) of the intended behavior (i.e., voting in support or opposition) may influence intention to perform the behavior. Beliefs about potential outcomes of reintroducing wolves to Colorado were measured by 14 items, on a scale of 1, strongly disagree to 7, strongly agree. These items represented impacts of wolf reintroduction, for example, on the environment, hunting opportunities, human safety, and the livestock industry. In the analysis we used a single belief item derived from a principal component analysis (PCA) score.

Lastly, we included the following 'other individual characteristics': sociodemographic items of age, gender, level of education (binned into two options; less than college or college education), and income level; urban or rural residence, stratified by Front Range, Western Slope,

and Eastern Plains; and experience hunting and ranching. To measure experience hunting we asked if participants had ever participated in recreational (non-commercial) hunting, response options yes or no. To measure experience ranching we asked participants if they raised commercial livestock, response options yes or no. We included these characteristics because they have been found in prior literature to influence attitudes towards carnivores (Franchini et al., 2021; Nie, 2001).

**Analysis**

To reduce the dimensionality of the variables measuring beliefs, and to allow for greater degrees of freedom in our analyses, we conducted a PCA with varimax rotation on our 14 belief measures ($\alpha = 0.618$). We assessed scree plots and factor loadings to simplify to the first principal component (Eigenvalue (variance) = 42.01) which represented an axis of belief in positive versus negative outcomes. Our objective was to compare beliefs about the outcome of wolves to perceived social norms, rather than identifying the potential effects of specific beliefs. Thus, we dropped the belief measure that reintroduction would result in ranchers killing wolves because it did not load strongly with the single dimension expressed by the other items (factor loading .256 when all others were .5 or greater). We conducted reliability analysis (Cronbach's $\alpha$) to test internal consistency among the four intended collective action measures. Finding consistency was high ($\alpha = 0.884$), we averaged the values of these items to create one intended collective action outcome variable for each participant. Lastly, to reduce the dimensionality of predictors and avoid issues of collinearity due to high correlation (Pearson's $r = 0.62$), we averaged our two descriptive norm variables. However, given our interest in the influence of the family and friends reference groups for the injunctive norms items, we did not combine these variables during analysis. To ensure consistency across our models, we only retained survey

responses that contained data for all variables so that the same participants were included in all models (Lischka et al., 2019). Thirty subjects (4% of sample) were dropped. Our retained sample's average scores for outcome variables were similar to the dropped subjects (e.g., 82.4% of retained sample intended to vote in support compared to 80.0% of dropped subjects; the average collective action score of the retained sample is 1.9 compared to 2.1 for the dropped subjects).

We performed model comparisons in three separate analyses to explore the influence of our predictors on three separate outcome variables: 1) voting intention; 2) intended collective actions among intended affirmative voters; and 3) intended collective actions among intended negative voters. We examined four alternative models (figure 2), with different predictors, for each of these analyses. These models included: the *full model*, comprised of all predictor variables; the *no norm model*, which included only the 'other perceptions' and 'other individual characteristic' predictor variables; the *injunctive norms model*, which included the injunctive norm variables and the 'other perceptions' and 'other individual characteristic' predictor variables; and, the *descriptive norms model* which contained the perceived descriptive norm variable and the 'other perceptions' and 'other individual characteristic' predictor variables. For the voting intention outcome, a dichotomous variable, we fitted binary logistic regressions for each model. For the intended collective action outcome, a continuous variable, we fitted linear regressions for each model for the subset of participants who intended to vote in support of reintroduction, and linear regressions for each model for the subset who intended to vote in opposition to reintroduction. We decided to explore drivers of intended collective actions separately for those in support and opposition to reintroduction to identify if drivers differed for those with different voting intentions.

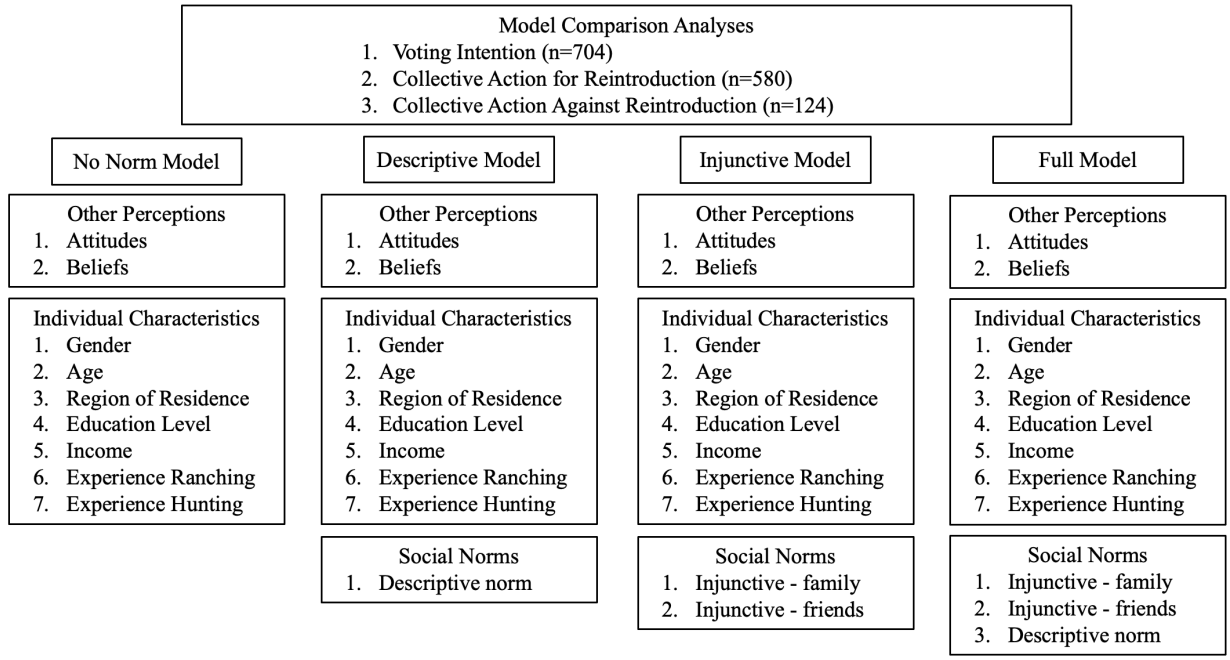


Figure 2**.** The four models, with the variables contained in each model, that we included in our multiple regression model analyses for three different outcome variables. The first analysis explored intention to vote in support or opposition to reintroduction, the second analysis explored plans to engage in collective actions in support of reintroduction, and the third analysis explored plans to engage in collective actions in opposition to reintroduction.

After running our regressions, we compared the fit of the four models within each of the three analyses using the Akaike Information Criterion (AIC), where models with the lowest AIC values reflected greater empirical support from the data. To determine our best-fitting model, we follow Burnham and Anderson's (2004) guideline that models with a ΔAIC score less than or equal to two have substantial support for fit. In the event that there was uncertainty about the best fitting model in an analysis (i.e., multiple models with a ΔAIC score less than or equal to 2), we chose to examine the effects of the most parsimonious model. To identify the degree of variance explained by our models, we report McFadden pseudo-$R^2$ for the binary logistic regressions (i.e., voting intentions) and the adjusted $R^2$ for the linear regressions (i.e., intended collective actions). Lastly, after reporting our model comparisons, we report the beta coefficients for our best fitting

models, where our criterion for reporting significant variables was a *p*-value of less than 0.05. Quantitative analyses were performed using the statistical software package R Studio.

## Results

### Description of Sample

Our sample consisted of 704 responses: 50.6% reported living in the Front Range (n= 356), 36.9% in the Western Slope (n= 260), and 12.5% in the Eastern Plains (n= 88); 50.5% identified as female (n= 356); and 32.8% were between the ages of 18-34 (n= 231), 33.7% between 35-54 (n= 237), and 33.5% were 55 years or older (n= 236). Our sample was relatively educated, with 53.5% having at least some college (n= 377). Lastly, 32.7% of respondents indicated they recreationally hunt (n= 230) while 3.6% indicated they raise commercial livestock (n= 25).

For our outcome variables, 82.4% of respondents reported intentions to vote in favor of wolf reintroduction (n= 580) and 17.6% intended to vote against reintroduction (n= 124). The average scores (out of 5) of our intended collective action variables, before combing into one measure, were: join a local group, 1.76; call or send a letter to a representative, 1.79; discuss wolf management with others, 2.35; and write material for media outlets, 1.52. The average of the aggregate variable was 1.86.

### Predicting Voting Intentions

For voting intention (*n*= 704), our results indicate that the *full model* had the most explanatory power (Table 1) and explained a high proportion of the variance in voting intention (McFadden $R^2 = 0.60$), indicating strong model fit.

Within the f*ull model*, the significant predictors of voting intention included injunctive norms of family ($\beta = 1.54$; *p*-value = 0.01) and perceived descriptive norms ($\beta = 0.45$; *p*-value =

0.04). Specifically, those who believed that their families expected them to vote in favor of wolf reintroduction, and those who believed many others were supportive of wolf reintroduction, were more likely to express intention to vote in favor of reintroduction. Additionally, the variable representing beliefs about the potential outcomes of wolves in Colorado was significant ($\beta$ = 2.21; $p$-value = < 0.01). This indicates that those who believed that wolves in Colorado would lead to positive outcomes, such as restoring the environment, were more likely to indicate they would vote in support. Those who believed wolves would lead to negative outcomes were less likely to vote in support (Table 2). Those who had experience hunting were more likely to report they would vote in opposition ($\beta$ = -0.90; $p$-value = 0.05). Lastly, those with less than a college-level education were less likely to intend to vote in favor ($\beta$ = -0.91; $p$-value = 0.04).

Table 1**.** Model characteristics and relative fit indices for each of the four alternative models within the voting intention, intended collective action in support of wolf reintroduction, and intended collective action in opposition to wolf reintroduction analyses.

| Outcome Variable and Model | Predictors Included in Model | AIC | ΔAIC | $R^2$ |
|---|---|---|---|---|
| Voting Intention | | | | |
| Full Model | Attitude, Belief, Demographic, Injunctive, Descriptive | 275.31 | 0 | 0.6 |
| No Norms Model | Attitude, Belief, Demographic | 320.20 | 44.89 | 0.51 |
| Injunctive Norms Model | Attitude, Belief, Demographic, Injunctive | 279.37 | 4.06 | 0.59 |
| Descriptive Norms Model | Attitude, Belief, Demographic, Descriptive | 298.05 | 22.74 | 0.55 |
| Intended Collective Action in Support of Wolf Reintroduction | | | | |
| Full Model | Attitude, Belief, Demographic, Injunctive, Descriptive | 1728.42 | 4.50 | 0.17 |
| No Norms Model | Attitude, Belief, Demographic | 1723.91 | 0 | 0.17 |
| Injunctive Norms Model | Attitude, Belief, Demographic, Injunctive | 1727.24 | 3.33 | 0.17 |
| Descriptive Norms Model | Attitude, Belief, Demographic, Descriptive | 1725.48 | 1.57 | 0.17 |
| Intended Collective Action in Opposition to Wolf Reintroduction | | | | |
| Full Model | Attitude, Belief, Demographic, Injunctive, Descriptive | 309.73 | 2.11 | 0.21 |

| | | | | |
|---|---|---|---|---|
| No Norms Model | Attitude, Belief, Demographic | 310.99 | 3.37 | 0.19 |
| Injunctive Norms Model | Attitude, Belief, Demographic, Injunctive | 313.16 | 5.54 | 0.19 |
| Descriptive Norms Model | Attitude, Belief, Demographic, Descriptive | 307.62 | 0 | 0.22 |

* McFadden pseudo-$R^2$ is presented for the binary logistic regressions (i.e., voting intentions) and the adjusted $R^2$ is presented for the linear multiple regressions (i.e., collective action in support of or in opposition to wolf reintroduction).

Table 2**.** Standardized beta coefficients, standard errors, and *p*-values for all variables in the analyzed model of each behavioral outcome variable: the *full model* of voting intention, the *no norms model* of intended collective action in support of wolf reintroduction, and the *descriptive norms model* of intended collective action in opposition to wolf reintroduction analyses.

| Model | Variable | *β* | SE | *p*-value |
|---|---|---|---|---|
| Voting Intention (*full model*) | | | | |
| | Attitude | 0.36 | 0.20 | 0.07 |
| | Beliefs | 2.21 | 0.59 | 0.00* |
| | Descriptive norms | 0.45 | 0.21 | 0.04* |
| | Injunctive norms (family) | 1.54 | 0.63 | 0.01* |
| | Injunctive norms (friends) | 0.87 | 0.55 | 0.11 |
| | Gender | -0.37 | 0.42 | 0.39 |
| | Education | -0.91 | 0.45 | 0.04* |
| | Age | -0.04 | 0.19 | 0.84 |
| | Income | 0.20 | 0.21 | 0.35 |
| | Experience ranching | -0.21 | 0.77 | 0.78 |
| | Experience hunting | -0.90 | 0.45 | 0.05* |
| | Region (Front Range-Western Slope) | 0.09 | 0.38 | 0.81 |
| | Region (Front Range-Eastern Plains) | 0.18 | 0.48 | 0.71 |
| Intended Collective Action in Support of Wolf Reintroduction (*no norms model*) | | | | |
| | Attitude | 0.23 | 0.06 | 0.00* |
| | Beliefs | 0.02 | 0.06 | 0.75 |
| | Gender | 0.20 | 0.10 | 0.05* |
| | Education | -0.19 | 0.10 | 0.07 |
| | Age | -0.18 | 0.04 | 0.00* |
| | Income | -0.06 | 0.06 | 0.25 |
| | Experience ranching | 0.57 | 0.31 | 0.07 |
| | Experience hunting | 0.28 | 0.11 | 0.01* |
| | Region (Front Range-Western Slope) | 0.01 | 0.10 | 0.91 |
| | Region (Front Range-Eastern Plains) | -0.08 | 0.15 | 0.58 |
| Intended Collective Action in Opposition to Wolf Reintroduction (*descriptive norms model*) | | | | |
| | Attitude | 0.01 | 0.07 | 0.88 |
| | Beliefs | 0.04 | 0.09 | 0.61 |

| | | | |
|---|---|---|---|
| Descriptive norms | 0.16 | 0.08 | 0.05* |
| Gender | -0.23 | 0.15 | 0.14 |
| Education | 0.22 | 0.17 | 0.20 |
| Age | -0.08 | 0.08 | 0.32 |
| Income | -0.15 | 0.08 | 0.07 |
| Experience ranching | 0.82 | 0.57 | 0.15 |
| Experience hunting | 0.36 | 0.14 | 0.02* |
| Region (Front Range-Western Slope) | 0.42 | 0.18 | 0.02* |
| Region (Front Range-Eastern Plains) | -0.19 | 0.12 | 0.11 |

*Represents the significant variables based on our criteria of $p < .05$

**Predicting Intended Collective Actions in Support of Wolf Reintroduction**

For intended collective action in support of wolf reintroduction ($n = 580$), the *no norms model* and *descriptive norms model* had the lowest AIC scores (Table 1). When comparing the two models, there was no identifiable difference in fit ($\Delta AIC = 1.569$). This suggests that any enhanced explanatory power provided by the descriptive norms variable did not improve model performance to outweigh complexity of the descriptive model. Thus, to examine which variables were potentially predictive of intended collective action behavior, we report coefficients from the *no norms model*, given it is the more parsimonious of the two best-fitting models even though it has relatively low explanatory power (adjusted $R^2 = 0.17$).

Within the *no norms model*, those with more positive attitudes towards wolves ($\beta = 0.23$; $p$-value < .01), women ($\beta = 0.20$; $p$-value = .05), and younger respondents ($\beta = -0.18$; $p$-value < .01) were more likely to report intending to engage in collective actions (Table 2). Additionally, participants who had experience hunting ($\beta = 0.28$; $p$-value = .01) were more likely to intend to engage in collective action.

**Predicting Intended Collective Actions in Opposition to Wolf Reintroduction**

For intended collective action in opposition to wolf reintroduction ($n = 124$), the *full model* and *descriptive norms model* had the lowest AIC scores (Table 1). Again, there was no identifiable difference in fit between the two models ($\Delta AIC = 2.107$). We chose to retain the

most parsimonious model, the *descriptive norms model*, while noting that this model did not explain a large proportion of the variance in intended collective action behaviors (adjusted $R^2$ = 0.22).

Three of our predictors in this model were significant (Table 2). Those who perceived a greater number of others intended to vote in opposition to the reintroduction of wolves (i.e., descriptive norm) were more likely to intend to engage in collective action against reintroduction ($\beta$ = 0.16; $p$-value = 0.05). Lastly, those with experience hunting ($\beta$ = 0.36; $p$-value < 0.05) and those who resided in the Western Slope of Colorado ($\beta$ = 0.42; $p$-value < .05) were more likely to intend to engage in collective action against wolf reintroduction.

## Discussion

As it is the first time reintroduction of an endangered carnivore species has been brought to a public vote, this is a particularly unique case study to investigate drivers of planned civic actions related to carnivore conservation. We explored voting intention for a proposed ballot initiative to reintroduce wolves in Colorado and intended collective civic actions to influence wolf management if reintroduction were to occur. We compared the influence of perceived social norms to the effects of attitudes, beliefs, and other individual characteristics (e.g., sociodemographics), which are typically examined in studies of carnivore conservation, and found that perceived descriptive and injunctive norms about voting were significant predictors of voting intentions. Further, perceived descriptive norms about voting predicted intentions to engage in collective actions for those who opposed reintroduction but not for those who supported reintroduction.

There is ample evidence in the literature that social norms enhance voter turnout (Fieldhouse et al., 2020); civic duty is a social norm (Coleman, 2004); and voting behavior

spreads through social networks (Bond et al., 2012). Here, we demonstrate that both perceived descriptive and injunctive norms may also influence voting in support of or opposition to a specific conservation issue. Our findings mirror results from studies on voting behavior in non-natural resource contexts (Blais et al., 2019; Fieldhouse & Cutts, 2020). For example, Fieldhouse and Cutts (2020) surveyed voters in the European Parliament elections and identified that both injunctive and descriptive norms influenced individuals' decision to vote or abstain. Additionally, we found that those who thought their family, rather than their friends, expected them to vote in favor were more likely to report that they intended to vote in favor. Blais et al. (2019) and Fieldhouse and Cutts (2020) also found that familial voting behavior, particularly of a partner or spouse, predicted intentions to vote.

For those who opposed reintroduction, perceived descriptive norms about others' intended voting added predictive value for their intended collective actions. Specifically, those who believed a high proportion of others intended to vote in opposition were more likely to report intentions to engage in collective actions. This may reflect findings from Matthes et al.'s (2018) meta-analysis that political opinion expression (e.g., discussing an opinion with others) is influenced by opinion support (i.e., perceptions of others' opinions). These authors integrated studies that measured opinion expression as willingness to discuss an issue with others and as engaging in other political actions, including demonstrating, campaigning, signing petitions, and donating money to political groups. We used similar civic actions to measure opinion expression but also added new behaviors of reaching out to a government representative, joining an interest group, and writing materials for media outlets in our aggregate variable. Future studies should continue to explore how perceived opinion support influences different types of opinion expression.

Being a rural resident of the Western Slope of Colorado also predicted intended collective actions for those against wolf reintroduction. This finding may be linked to research showing wolves have become a symbolic manifestation of deeper culturally based values inherent in the urban/rural divide. Opposition to wolves may be connected to narratives about existential threats to rural ways of life, and thus associated with rural residence (Nie, 2001). Cultural cognition theory suggests that such cultural divides over societal issues may result from how individuals filter information through, and form opinions that align with, pre-existing world views and the views of their social groups (Beall et al., 2021; Knackmuhs et al., 2019). Further, given that wolves will be reintroduced in the Western Slope, this finding may reflect research showing that 'obtrusive issues', or those issues that a group perceives as directly impacting their lives, are more likely to influence opinion expression (Matthes et al., 2018).

TPB suggests that behaviors are influenced by behavior-specific social norms (e.g., norms of voting predict intentions to vote; Fishbein & Azjen, 2010). Our finding that perceived social norms about voting influenced intentions to engage in collective actions, by those intending to vote in opposition, suggests that non-behavior-specific norms may also be impactful in some instances. This finding relates to prior work that suggests perceptions of others' support for an issue, which we gauged by measuring perceived norms of voting, can influence engagement in collective actions (Geiger & Swim, 2016; Matthes et al., 2018; Niemiec et al., 2018). Additionally, Niemiec et al. (2018) found that normative interventions showcasing the number of others who support invasive species removal effectively increased recruitment and coordination of neighbors to control invasive species. However, it is possible that, had we measured collective action-specific social norms (e.g., "would your family and friends expect you to reach out to others to influence wolf management"), we may have seen a greater effect of

norms on intended collective actions. It may be helpful to explore this distinction further in future research. More broadly, given that conservation issues are increasingly being brought to a vote, continuing to explore the influence of perceived opinion support for conservation issues on collective actions is an important area of continued research.

**Limitations and Future Research Directions**

When interpreting our results, several limitations should be considered. To note, 82.4% of our participants reported intentions to vote in support of reintroduction, yet the final 2020 vote passed with only 50.9% in support (Colorado Election Results, 2020). Immediately following the election, we conducted a follow-up study, using the same survey and methods, and identified that this discrepancy resulted from both a small survey bias (26% overestimation of support) and rapid decrease in support among Coloradan voters (Niemiec et al., 2022). This suggests that the sample in the current paper is more inclined to support wolf reintroduction than the Coloradan public and future studies should examine whether the same patterns emerge for more representative samples in terms of support for carnivore initiatives and potentially for less controversial species. The subsample size (n = 124) for intended collective action in opposition to wolves was relatively low compared to the number of variables (12), which may have resulted in overfitting and influenced our finding on the significance of perceived descriptive norms. Further, though our models for intended collective actions had relatively low explanatory power we still find it valuable to report these findings to exemplify that perceived opinion support (i.e., how others intend to vote for reintroduction, a descriptive norm) may influence opinion expression, measured as collective civic actions, in some cases. This finding provides an impetus for further exploration of the relative influence of these additional types of norms. However, the low explanatory power suggests that there are other important variables that predict collective

actions that we did not measure and may also reflect the fact that we measured norms of voting rather than of engaging in collective actions.

We designed our injunctive norm measures following a large body of literature that suggests perceived expectations from others is sufficient to guide behavior (see Rimal & Real, 2005), however future studies could measure injunctive norms as the perception of sanctions for not adhering to the expected behavior and/or as perceived approval from others (Fishbein & Ajzen, 2010). Moreover, the collective actions we measured were civic focused behaviors; future work should also explore common behaviors, such as sharing information about wolf management on social media (Casola et al., 2020). Finally, continued testing of the influence of descriptive compared to injunctive norm messaging to encourage biodiversity-related collective actions is an important future research direction. Prior research does suggest that messaging alone, particularly through single-exposure messages, is often insufficient to change perceptions and behaviors related to contentious issues like wolf restoration (Meadows et al., 2005; Niemiec et al., 2020c); likely, due to the deeply held values and identity-based perspectives impended in such conflicts (Madden & McQuinn, 2014). Therefore, future research might explore more in-depth social influence interventions, such as encouraging motivated individuals to diffuse normative information throughout their social networks, to enhance support and foster collective actions (Abrahamse & Steg, 2013).

**Conclusion**

We built on a growing body of literature on social norms, opinion climate, and civic action behavior to better understand voting and collective action intentions for a biodiversity conservation initiative. Our findings suggest that both perceived descriptive and injunctive norms about voting influence voting intentions for a carnivore conservation initiative, above and

beyond attitudes, beliefs, and other individual characteristics (e.g., sociodemographics). Additionally, perceived descriptive norms about voting influenced intentions to engage in collective actions in opposition to carnivore reintroduction, supporting previous work on opinion climate and opinion expression in other political domains. Our results suggest that practitioners seeking to promote support for conservation initiatives may want to highlight the large number of others who are supportive of those initiatives in outreach and messaging campaigns. Furthermore, signaling relevant descriptive norms (e.g., people like you plan to behave a certain way) in messaging might be more effective than sharing information on injunctive norms (e.g., people like you think you should behave a certain way) when seeking to encourage participation in collective actions. Overall, our results highlight the need to move beyond individual attitudes and beliefs to design research, outreach, and governance processes that consider the role of group-based influences such as norms on civic actions for conservation.

# CHAPTER II: STAKEHOLDER ENGAGEMENT FOR SPECIES REINTRODUCTION: STAKEHOLDER-DERIVED MEASURES OF SUCCESS

## Introduction

A growing body of literature has highlighted the value of stakeholder engagement (SE) in conservation and natural resource management (CNRM) (Bierle, 2002; Decker et al., 2005; Luyet et al., 2012; Reed, 2008, 2018). SE can refer to a variety of processes with varying objectives, but generally indicates a procedural tool through which stakeholders and the public can participate in and influence management decision-making and project implementation through interventions such as outreach, consultation, deliberation, negotiation, and consensus-building (Bobbio, 2019; Jimenez et al., 2019; Talley et al., 2016). Outreach-oriented engagement, such as public hearings, surveys, and focus groups, are consultative in nature, while other more intensive processes facilitate consensus-building, conflict reconciliation, and, at times, may empower participants to co-create and implement management plans (Bierle, 2002; Bobbio, 2019; Cehajic-Clancy et al., 2016; Luyet et al., 2012). Definitions of the term stakeholder vary, but typically refers to those possibly affected by or who have a stake in the natural resource issue. Most often actors from industry, academia, NGOs, and government, as well as from Tribal Nations, are included as stakeholders in SE processes (Colvin et al., 2016; Garad & Kowarsch, 2017).

There is a call amongst both academics and practitioners for increased use of SE processes to make important CNRM decisions (Decker et al., 2005; Reed, 2008, 2018; Sterling et al., 2017; Young et al., 2013). Motivations typically include the desire to empower citizens, pursue democratic ideals, or to increase the legitimacy of policy choices in the eyes of citizens (Bobbio, 2019; Lundmark & Matti, 2015). Further, research suggests that more intensive

processes, which are those that engage stakeholders in collaborative dialogue, deliberation, or decision-making, have the potential to lead to enhanced social, technical, and ecological outcomes (Bierle, 2002; Young et al., 2013). For example, Bierle (2002) found that across 239 published case studies of CNRM issues, SE processes, particularly those that allowed for increased participant ownership of the process and outcomes, were found to be associated with higher quality decisions. However, some scholars argue that SE can introduce risks, especially as the intensity of participation increases (Bobbio, 2019; Reed, 2008). SE can be time consuming, expensive, can lead to potential stakeholder frustration, and, at times, the identification of new conflicts (Luyet et al., 2012). Processes may also amplify existing power dynamics when not representative of diverse perspectives (Vucetich et al., 2021). Evaluating SE processes to understand the impact of different design choices and the outcomes in various contexts, is important for achieving benefits and avoiding potential pitfalls, yet systematic evaluation of SE in CNRM contexts is rare (Rowe & Frewer, 2000).

There are several best practices for procedural criteria (PC) described in the literature that can assist in evaluating SE processes to identify effective design choices (Luyet et al. 2012; Reed 2008; Talley et al., 2016). Such criteria include ensuring: stakeholders are involved in objective setting at the outset of a process; systematic representation of stakeholder groups and diverse interests; the process is run by highly skilled, third-party facilitators; and both local and scientific knowledge is integrated (Reed, 2008; Young et al., 2013). Chase et al. (2004) identified additional criteria that stakeholders prioritized in their survey-based study of suburban-wildlife conflicts in which agency staff were planning SE. These included that process participants can genuinely influence the decision, that the process promotes communication and learning, and that the process is both time and cost effective.

A second evaluation pathway includes assessing the outcomes of the process. Identifying the quality of decisions made is often used to evaluate success (Bierle, 2002; Bobbio, 2019). However, SE processes can also achieve important social outcomes (SO) that should be considered during evaluation. Such SO may include increased support for policy and management approaches, increased trust in decision-makers, and enhanced diversity, equity, and inclusion (Luyet et al. 2012; Madden & McQuinn 2014; Reed 2008; Vaske et al., 2018; Young et al., 2013). Research on deliberation-based SE suggests such processes can increase participants' civic capacity, ability to make reasonable and informed arguments, and sense of collective interests (Bobbio, 2019; Lundmark & Matti, 2015). Increasingly SE processes are used to deal with complex, divisive, and polarizing CNRM issues in order to reduce social conflict and enhance social learning about diverse perspectives and values amongst participants (Madden & McQuinn, 2014; Schusler et al., 2003; Tippett et al., 2005; Walker et al., 2006; Zimmerman et al., 2020). Given the prioritization of these SO, there are several specialized SE processes designed with the explicit objective of achieving them. For example, Collaborative Learning, developed by Daniels and Walker (2001), is an SE process geared toward complex and conflictual CNRM issues wherein experiential adult learning activities are implemented throughout the process to encourage joint learning, open communication, and conflict mediation.

Few studies have examined which PC and SO are most important to stakeholders, and if there are additional criteria and outcomes stakeholders would prioritize (Santos & Chess, 2003; Young et al., 2013). SE can serve different purposes for the various relevant actors involved and there may be differing definitions of success between process implementers and stakeholders. Thus, success should be evaluated by a combination of different actor's prioritized criteria and outcomes (Bobbio, 2019; Santos & Chess, 2003; Young et al., 2013). We argue there are two

primary groups of those stakeholders that are highly engaged in CNRM issues for which SE is being run: (1) highly engaged stakeholders internal to a process (e.g., individuals serving on an advisory council), and (2) highly engaged stakeholders external to the process but who are motivated to influence the CNRM issue at hand. In this context, there are likely different expectations for an SE process and associated outcomes between those stakeholders directly involved in a process and those who are not officially part of it. Yet, even fewer studies have examined process expectations of those external to a process (for exceptions see Chase et al., 2004; Garard & Kowarsch, 2017; Walker et al., 2006). Moreover, the extent to which the touted benefits of SE processes (e.g., support for decisions, enhanced trust, etc.) are achieved throughout the broader relevant community is unclear.

Understanding the expectations that highly engaged external stakeholders have for SE processes is important because achieving desired CNRM goals often necessitates widespread support and cooperation throughout the relevant community. Such stakeholders are often seen as opinion leaders by community members, and they can greatly affect CNRM initiatives and community support for policy decisions (Garard & Kowarsch, 2017). The case of wolf reintroduction in Colorado exemplifies the influence highly engaged stakeholders can have on CNRM issues. After nearly 70 years since wolves were exterminated from the state, highly engaged environmental stakeholder groups used their influence to collect sufficient signatures to add a ballot initiative, Proposition 114, to reintroduce wolves to the 2020 ballot (Niemiec et al. 2020a). Several surveys in the years leading up to the initiative found high levels of public support for wolf reintroduction (Pate et al., 1996; Niemiec et al., 2020a). In 2019, a public survey found 80% of Coloradans supported reintroduction (Niemiec et al., 2020a), yet the final vote passed by a narrow margin of 50.9% (Colorado Election Results, 2020). A post-election survey

identified that, despite some sampling bias, there was indeed a rapid decrease in support for reintroduction among Coloradan voters (Niemiec et al. 2022). This was attributed in part, to a widespread increase in beliefs that wolves would result in negative outcomes, such as attacks on livestock, a change that may have stemmed from outreach efforts of other highly engaged stakeholder groups that opposed reintroduction.

**Study Framework**

We advance the current body of research on evaluating SE processes in CNRM by examining stakeholders' expected criteria and outcomes for an SE process and by comparing them to a research-based SE evaluation framework (Young et al. 2013). Santos and Chess (2003) note that the majority of SE process evaluations use only theoretical and research-based approaches to measure success which may be insufficient for evaluations. Adding stakeholder-derived evaluation metrics, based on stakeholders' expected criteria and outcomes, to a research-based evaluation framework allows stakeholders' expectations to be included as a context-specific measure of success (Santos & Chess, 2003).

To develop their framework, Young et al. (2013) used the theoretical PC described by Rowe and Frewer (2000), including representativeness, independence, transparency, influence, early involvement, and cost-effectiveness. Young et al. (2013) also incorporated SO discussed by Beierle and Konisky (2001), including stakeholder values, technical quality, conflict resolution, trust in stakeholders, learning, and creation of new structures (see tables 4 and 5 in results for definitions of criteria and outcomes). To test their framework and explore the links between PC to the perception of SO achieved, Young et al. (2013) conducted a post-hoc assessment of three case studies of stakeholder involvement in the development and implementation of biodiversity management plans in Scotland. They found that learning (a SO) was improved by the early

involvement of stakeholders (a PC) and their ability to influence decision-making. They also found that trust in other stakeholders was influenced by the process being unbiased and allowing for input in decision-making. To our knowledge, this is one of the most comprehensive and tested evaluation frameworks in the CNRM literature that is comprised of both process elements (PC) and process outcomes (SO).

**Colorado Context**

In Spring, 2021, Colorado Parks and Wildlife (CPW), the state wildlife agency tasked with reintroducing wolves after the 2020 election, began implementing a planning process to begin reintroduction by the end of 2023. The overall reintroduction planning process included an extensive multi-year and multi-phase stakeholder and public involvement process. This entailed assembling a Technical Working Group (TWG) of experts on topics such as wolf biology, wolf management, and conflict minimization, who met monthly to develop recommendations for the wolf restoration and management plan. Additionally, CPW selected 15 stakeholders via an open application process from local government, ranching, hunting, environmental, and wolf advocacy groups, as well as a Sovereign Native American nation, to serve on a Stakeholder Advisory Group (SAG). The SAG met monthly, sometimes in coordination with the TWG, to learn and engage in dialogue about management options and develop recommendations. Recommendations developed by both the TWG and SAG were ultimately considered by the Colorado Parks and Wildlife Commission, which is the citizen board, appointed by the Governor, that sets state regulations for Colorado's state parks and wildlife programs and is the final decision-making body of the wolf restoration and management plan. CPW hired a third-party facilitator, Keystone Policy Center, to run the SAG and TWG meetings as well as the public outreach process, which involves a suite of opportunities (e.g., public meetings, focus groups, online public

commentforms) for the agency and facilitators to provide information to and seek input from the public.

Our specific research questions were:

1. Which procedural criteria (PC) and social outcomes (SO) from Young et al.'s (2013) SE evaluation framework were identified as important by highly engaged external stakeholders when considering wolf reintroduction in Colorado?
2. To what extent do stakeholders identify additional PC and SO that can be used as evaluation metrics in the study context?

## Methods

Our research included two phases. In phase one, we conducted a survey of highly engaged stakeholders who were not members of the SAG but who had the opportunity to participate in the broader public involvement efforts such as attending SAG and other public meetings, providing written public comment or testimony at Parks and Wildlife Commission Meetings, and participating in agency-led town hall meetings or focus groups. Second, we recruited a subsample of the survey participants for an interview to explore participant expectations and perceptions about the SE process in more depth. We conducted semi-structured interviews to allow for flexibility in what was discussed so that participants could freely express their own ideas, which is ideal for exploratory research. Herein, we report findings from these interviews.

### Participant Recruitment

During phase one, we conducted a stakeholder analysis to identify the most relevant stakeholder groups. This included our research team brainstorming a list of stakeholder groups, after which we shared our list with the Keystone Policy Center, who designed and facilitated the

SE process, and with a senior staff member from CPW. Ultimately, we identified 15 specific stakeholder groups: ranch owners; ranch employees; environmental NGOs; animal welfare/rights activists; zoos or wildlife centers; federal wildlife agencies; state wildlife agencies; local government or county commissioners; sovereign Native American nations; groups representing black, indigenous, and people of color (BIPOC) interests; big game hunters; outfitters; outdoor recreation groups; ecological scientists; and social scientists. We used four sources to identify highly engaged individuals from these stakeholder groups to recruit for our study (Colvin et al., 2016): (1) lists of individuals who had applied to be on the SAG but were not selected; (2) lists of individuals who attended a focus group or provided public comment during SAG meetings; (3) a review of stakeholders who were quoted in Colorado media coverage about wolf reintroduction and management; and (4) snowball sampling from the first stakeholders who participated in our study. Overall, these sources led to the identification of 345 total individuals, who we invited to participate in phase one our study in July, 2021. The individuals we invited were not official representatives of particular stakeholder groups, rather they perceived themselves as belonging to one of the 15 groups. Ultimately 92 stakeholders joined our study.

Starting in August, 2021 we began phase two by recruiting interviewees from the list of 92 stakeholders who participated took our survey. Because we wanted broad and equal representation across the 15 stakeholder groups, we organized individuals into one of nine larger categories, which included: 1) animal welfare/rights activists and pro-wolf environmental NGOs, 2) environmental NGOs that are neutral and/or span both ranching and wildlife interests, 3) zoos and wildlife tourism groups, 4) hunters and outfitters, 5) ranch owners and ranch employees, 6) county commissioners and local government employees, 7) BIPOC and Native American nation representatives, 8) state and federal wildlife managers, and 9) social and ecological scientists. We

did this to ensure we included at least two individuals from each broad stakeholder category. As an additional check to ensure we explore a breadth of perspectives about the SE process, we examined participants' survey responses to the question asking them if they believed CPW's SE process would meet PC and achieve SO. Each item was measured on a 5-point scale and we averaged responses to assign a "process expectation" score from 1-5, with 1 indicating they had low expectations related to the SE process and 5 indicating they had high expectations. This allowed us to interview individuals with both low and high process expectation scores. From this analysis we identified 28 total participants, 24 of whom participated in phase two interviews resulting in an 85.7% response rate. See table 3 for the stakeholder group and process expectation score for each interviewee.

Table 3**.** The stakeholder group and process expectation score for each of the 24 participants we interviewed in this study. The process expectation score ranges from a 1 (low expectation) to a 5 (high expectation). The interviewee number listed here corresponds to the interviewee numbers stated before each quote in the results section.

| **Interviewee** | **Stakeholder Group** | **Process Expectation Score** |
|---|---|---|
| Interviewee 1 | Hunter/Outfitter | 2.36 |
| Interviewee 2 | Native American Nations & BIPOC | 2.45 |
| Interviewee 3 | Native American Nations & BIPOC | 1.18 |
| Interviewee 4 | Ranching | 2.55 |
| Interviewee 5 | County Commissioners/Government | 4.91 |
| Interviewee 6 | Academia | 2.73 |
| Interviewee 7 | Zoos/Wolf Tourism | 2.45 |
| Interviewee 8 | Pro-Environmental NGO/Animal Welfare | 1.18 |
| Interviewee 9 | Zoos/Wolf Tourism | 3.64 |
| Interviewee 10 | Ranching | 3.82 |

| | | |
|---|---|---|
| Interviewee 11 | Neutral NGO (ranching & wildlife interests) | 3.64 |
| Interviewee 12 | County Commissioners/Government | 4.73 |
| Interviewee 13 | Hunter/Outfitter | 4.27 |
| Interviewee 14 | State/Federal Wildlife Manager | 3.00 |
| Interviewee 15 | County Commissioners/Government | 1.91 |
| Interviewee 16 | Hunter/Outfitter | 2.18 |
| Interviewee 17 | Neutral NGO (ranching & wildlife interests) | 3.55 |
| Interviewee 18 | Pro-Environmental NGO/Animal Welfare | 2.91 |
| Interviewee 19 | Native American Nations & BIPOC | 2.64 |
| Interviewee 20 | Native American Nations & BIPOC | 2.64 |
| Interviewee 21 | State/Federal Wildlife Manager | 3.18 |
| Interviewee 22 | Neutral NGO (ranching & wildlife interests) | 1.73 |
| Interviewee 23 | Pro-Environmental NGO/Animal Welfare | 4.0 |
| Interviewee 24 | State/Federal Wildlife Manager | 1.64 |

**Interview Questions**

We designed our full interview guide to explore perceptions related to the stakeholder and public engagement process, the development of the wolf restoration and management plan, and of wolf reintroduction into Colorado more broadly. We included five categories of questions: 1) expectations for the stakeholder and public engagement process, 2) social learning, 3) social conflict, 4) trust, and 5) wolf management approaches. Our interview began broadly with three questions designed to obtain an understanding of the expectations participants had for the SE process and whether and why they believed the process as they understood it would achieve desired outcomes. In this paper, we focus only on participant responses that are specifically related to expectations for and perceptions about the SE process. Our remaining four categories

of questions covered each of the four primary social outcomes detailed in the CNRM literature on SE processes (see 2-5 above).

To guide development of social learning interview items, we used the definition of social learning by Schusler et al. (2003), "learning that occurs when people engage one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action" (p. 311). Social learning items asked participants what type of information should be used during decision-making for wolf management, if they believed all types of perspectives and information were represented in the SAG, what they hope to learn from the process, and if/how they plan to share what they learn with others.

Questions about social conflict spanned four categories of perceptions identified in the literature including: perceptions about the nature of the conflict, perceptions of ingroup members and self, perceptions of outgroup members, and perceptions of the relationships between groups (Bart-Tal, 2007; Cehajic-Clancy et al., 2016). We focused on these perceptions because conflict and peace-building research suggests that to reduce conflict, interventions should be designed to target beliefs within these four categories of perceptions (Bart-Tal, 2007; Cehajic-Clancy et al., 2016). Our interview questions related to trust examined: participants' confidence that the SE process was implemented in a way that will incorporate their perspective; who they trust when seeking information about wolves; and their level of trust in CPW to develop and implement a wolf management plan that is in the best interest of wolves and Coloradans. We expanded upon definitions of trust identified in the literature which suggest that trust, as a concept, relates to perceptions of shared values, technical competence, fairness and legitimacy of processes and outcomes, and accuracy and truthfulness of information (Needham & Vaske, 2008; Schroeder et al., 2020; Quartuch, 2020). Finally, we asked participants to describe the types of wolf

management approaches they expected CPW and the SAG to consider and to describe their ideal wolf management plan, highlighting the types of management approaches they think are or are not acceptable.

**Thematic Content Analysis**

We used a combined deductive and inductive thematic content analysis approach to identify meaningful topics, ideas, and patterns (Braun and Clarke, 2006; Saldaña, 2016). A deductive approach involves analyzing data using predetermined themes as identified from existing theory or frameworks whereas an inductive approach is driven by the data and allows for identification of new themes as novel patterns emerge (Saldaña, 2016). We did this to explore both research-based and stakeholder-derived expectations for SE processes (Santos & Chess, 2003). We derived our deductive theoretical themes from Young et al. (2013) which included six themes of PC (table 4) and five themes of SO (table 5).

**Procedure.** Our analysis consisted of two cycles of coding. First, we applied our theoretical themes of PC and SO to a random sample of 8 interviews in order to develop a codebook of context-specific definitions and to inductively identify any novel stakeholder-based themes. Two researchers conducted this first-cycle coding by independently coding each of the eight interviews, one-by-one, and then coming together after each interview to compare the application of deductive themes, explore new themes, and to reach consensus. Following this, the two researchers developed a full codebook complete with the addition of two inductive stakeholder-derived PC and two inductive stakeholder-derived SO. Next, we included an expert review by a senior researcher from the full study who is the Human Dimensions Specialist from CPW and deeply familiar with the SE processes and wolf reintroduction in Colorado. This included the expert reviewing the codebook definitions of each theme and two interviews from

the first-cycle sample to provide feedback on the application of themes. Next, we held a workshop with the expert to review each theme in depth and to finalize the codebook. Finally, second-cycle coding included the two coders each coding half of the 24 interviews, including those form the first-cycle coding, coming together frequently to compare application of codes and achieve consistency. All interviews were transcribed using Otter.ai and coded in the NVivo software program.

## Results

Participants described four of Young et al.'s (2013) six PC including: representativeness, influence, transparency, and independence/unbiased. Cost-effectiveness and early involvement were not discussed by participants. Additionally, participants emphasized three of the six SO in Young et al.'s (2013) SE framework, including learning, conflict resolution, and stakeholder values. Of the remaining three SO, technical quality and trust in other stakeholders were minimally discussed, thus we do not review them here, and identification of new structures was not discussed at all.

Through the inductive analysis, we identified two additional stakeholder-derived PC, intentional two-way communication and active inclusivity, and two additional stakeholder-derived SO, trust in agency and support for the final management plan. Across our 24 participants we coded for mentions of PC ($n$ = 111) and SO ($n$ = 86) a total of 197 times. See tables 4 (PC) and 5 (SO) for definitions of criteria and outcomes including the original definition by Young et al. (2013) and how we adapted these definitions to our context.

Table 4**.** A list of the procedural criteria, including those from the research-based SE evaluation framework and the two inductively identified stakeholder-derived criteria. Frequencies are out of the 24 participants in our study. We have provided definitions from Young et al., (2013) as well as our context-specific definitions that are based on participant responses.

| Procedural Criteria | Definition | Frequency |
|---|---|---|
| Representativeness: Were the participants representative of the affected public? (Young et al., 2013) | Includes discussions of the need for the SAG to be representative of diverse interests and for the need to incorporate diverse perspectives of all Coloradans when making decisions. | 75.0% (*n* = 18) |
| *Intentional 2-way Communication | Includes discussions of the need to formalize protocols for sharing updates about and decisions from the SE process, for SAG and TWG members to communication to Coloradans, and about the importance of two-way communication with CPW's 'boots on the ground staff. | 66.7% (*n* = 16) |
| Influence: Did participant input have a genuine impact on the management plan? (Young et al., 2013) | Includes discussions of the need for the stakeholder engagement efforts to have ample opportunities for meaningful input into decisions and about aspects of the SE process that will or will not allow for meaningful input. | 41.7% (*n* = 10) |
| Transparency: Was the public able to see what was happening and how decisions were made? (Young et al., 2013) | Includes discussions of reasons why transparency is important and if and how the process had been transparent. | 41.7% (*n* = 10) |
| *Active Inclusivity | Includes discussions of SE process design elements that foster or hinder inclusivity and systematic barriers to inclusivity that should be addressed. | 37.5% (*n* = 9) |
| Independence/Unbiased: Was the process carried out in an independent, unbiased way? (Young et al., 2013) | Includes discussions of the potential of a predetermined outcome, elements of the SE process that may lead to bias, and perceptions of bias in SAG membership. | 25.0% (*n* = 6) |
| Cost-effectiveness: Was the process cost-effective? (Young et al., 2013) | | 0.0% |
| Early Involvement: Were stakeholders involved as early as possible? (Young et al., 2013) | | 0.0% |

*Denotes an inductively derived stakeholder-based criteria

Table 5**.** A list of the social outcomes, including those from the research-based SE evaluation framework and the two inductively identified stakeholder-derived outcomes. Frequencies are out of the 24 participants in our study. We have provided definitions from Young et al., (2013) as well as our context-specific definitions that are based on participant responses.

| **Procedural Criteria** | **Definition** | **Frequency** |
|---|---|---|
| Learning: Did stakeholders become better educated and informed? (Young et al., 2013) | | 54.2% (*n* = 13) |
| | Includes discussions of both topical learning (i.e., about wolves and their management) and social learning (i.e., perspectives of others). | |
| Conflict Resolution: Was the conflict resolved among stakeholders? (Young et al., 2013) | | 41.7% (*n* = 10) |
| | Includes discussions of CPW's and SAG members' responsibility to manage the social conflict. | |
| Stakeholder Values: Were stakeholder values incorporated into decision-making? (Young et al., 2013) | | 41.7% (*n* = 10) |
| | Includes discussions of goals to have personal values and perspectives, or those of their communities, integrated into the management plan. | |
| *Trust in Agency | | 41.7% (*n* = 10) |
| | Includes discussions of the various elements of the SE process that influence trust and, conversely, of how pre-existing levels of trust may influence perceptions of the SE process and the ultimate wolf restoration and management plan. | |
| *Support of Management Plan | | 33.3% (*n* = 8) |
| | Includes discussions of the aspects of the SE process that may increase or decrease support for the final management plan. | |
| Technical Quality: Was the technical quality of decisions improved? | | 16.7% (*n* = 4) |
| Increased Trust: Was trust increased between stakeholders? (Young et al., 2013) | | 4.2% (*n* = 1) |
| Creation of New Structures: Were organizations established to implement decisions (Young et al., 2013) | | 0.0% |

*Denotes an inductively derived stakeholder-based outcomes

## Deductive SE Evaluation Framework Criteria and Outcomes

### *Procedural Criteria*

**Representativeness.** Participants emphasized that the process should be representative of all people and stakeholders in Colorado. Three-quarters of participants ($n$ = 18) described this criterion at least once. Specifically, representation was discussed in two primary ways: (1) the need for the SAG to be representative of diverse stakeholder interests and (2) generally, the need to listen to and incorporate a diverse set of perspectives that are representative of interests in Colorado, when making management decisions. However, there were differences of opinion on what being representative should look like. First, some participants shared the perspective that since reintroduction was decided on by ballot initiative and since wolves will be reintroduced on public lands, everyone in Colorado, including the general public, counts as a stakeholder. Conversely, some participants believed that those who have an increased possibility of being negatively affected by wolves, such as ranchers, outfitters, and western slope residents, count as the primary stakeholders and thus should have adequate if not more representation during the decision-making process for reintroduction and management plans.

> Interviewee 6 (representativeness of the SAG): It [their goal] would be having inclusive participatory approach to stakeholder engagement, having stakeholders that are diverse, that don't only include the sort of traditional constituents for Colorado Parks and Wildlife, but also giving stakeholders that typically haven't had a voice and having those stakeholders have a meaningful role in decision making.

> Interviewee 2 (general representativeness- all Coloradans): From the perspective of a state agency like CPW, they would want a detailed understanding…of all citizens within the state, they would want a broad swath of the general public's perspectives on wildlife management in general.

> Interviewee 4 (general representativeness- certain groups): To start off with real stakeholders on the ground, rural communities, livestock agriculture…those are the true stakeholders. And those needs should be addressed first and foremost. It's so disingenuous to say somebody on the Front Range that's not truly impacted by this is a

> stakeholder because they like the idea of wolves on the ground. And so to me, there's a very clear demarcation between a stakeholder versus an interested party.

**Influence.** Ten participants discussed influence in two primary ways: (1) the need for influence through ample opportunities to meaningfully engage in, and provide input in, both the SAG and broader public engagement efforts and (2) aspects allowing for or hindering influence in the SE process (at large), SAG, TWG, and broader public engagement.

> Interviewee 2 (the need for influence by meaningful engagement): So the traditional ways would be like having an open house or some sort of public forum or an online survey. I think those things can be useful but…I think that misses a tremendous amount of perspective in the community… I think there needs to be…ways to get [to] a to better sample [of] the public, and, provide ways for the public to engage that isn't onerous and that also provides the opportunity for meaningful input.

> Interviewee 13 (aspects allowing for or hindering influence): I do know someone who's on the SAG, so I've been communicating with him and he actually reached out to me to ask…if I had any opinions, which I thought was really nice…there's a lot of opportunities to be involved in to make sure you know, opinions are heard, and I think CPW has done a good job of that.

> Interviewee 4 (aspects allowing for or hindering influence): What I saw at that meeting, is the SAG being funneled into a position of rubber-stamping recommendations that came from the TWG. And initially this is maybe kind of stuff that is not very controversial and so they went along with that. I think you're gonna see that slam to a halt pretty quick.

**Transparency.** Ten participants focused on two main points regarding transparency, including: (1) importance of transparency for outcomes such as ameliorating negative perceptions and targeting misinformation around wolf impacts and management and (2) if and how the process had been transparent up to the time of the interviews; for example, on how SAG recommendations and public comments will be used during decision-making, how TWG and SAG meeting outcomes and notes are shared with the public, and the selection criteria used to choose SAG members.

> Interviewee 14 (importance of transparency): Number one, [the goal] to be…extremely transparent. And as part of that, to…ensure that the very best accurate information is, is

> widely disseminated…in many instances, on many issues. The challenge of disinformation is just horrific these days.
>
> Interviewee 21 (process transparency): I felt really free to speak my mind at the last SAG meeting, but I never did see the notes to know that my thoughts were actually captured, but I felt like it was very easy to speak my mind in a really supportive environment and people were listening.
>
> Interviewee 15 (process transparency): If I had goals for this process, full transparency. And that includes the transparency around the selection of the various groups with respect to the SAG. Full transparency to the various municipal governments, and Governmental Organizations such as all of the county commissioners, up and down the western slope …It would be really nice if the state was transparent on that, because it didn't appear to any of those entities that the state even listened to their application.

**Independence/Unbiased**. A quarter of participants ($n$ = 6) shared perceptions about the process as biased or not, with dialogue around this criterion focused on three main points: (1) the need for an un/biased outcome, which includes whether participants believed CPW was genuinely open to incorporating SAG recommendations (i.e., is there a pre-determined outcome or not); (2) which SE elements may or may not lead to bias or be perceived as biased by Coloradans, such as the use of a 3rd-party facilitator; and (3) whether the SAG composition was biased toward certain stakeholder interests.

> Interviewee 4 (un/biased outcome): I think the SAG was window dressing, I think CPW is checking off a box…the technical advisory group is where the rubber hits the road, CPW is making a deliberate decision…to cut out the SAG from observing those [TWG] meetings… so that that tells me that CPW, driven by the Polis administration, has a predetermined outcome.
>
> Interviewee 5 (SE elements perceived as biased or not & un/biased outcome): And I think that Keystone's done a good job of sort of setting that as a ground rule. It's just how well it [will] be done, and the [focus] groups that I've participated in, there been a couple, it does seem to be working…they've gotten different stakeholders at the table. And since it's not being operated by CPW, people are less suspicious of a predetermined outcome. I think Keystone Policy Center itself is pretty well regarded and, nonpartisan.
>
> Interviewee 8 (SAG composition): I've been an RN for 46 years in Colorado, we've had advisory groups, I've never seen one so biased.

### *Social Outcomes*

**Learning.** Participants who discussed learning ($n$ = 13) did so primarily in two ways: (1) topical learning, which includes the need for stakeholders and the public to learn about wolf reintroduction and management, or about the impacts of wolves on the landscape, as an outcome of the SE process and (2) social learning, meaning stakeholders and the public learning about the various perspectives, needs, concerns, and values related to wolf recovery, as an important outcome of the process. Some participants also shared personal experience with social learning as an outcome of their participation in the SE process.

> Interviewee 10 (topical learning): If a farmer loses five sheep, how do they identify that it was a wolf kill? How are they compensated? What steps can be taken to avoid or prevent or minimize that? And I think that's [learning about those topics] going to be the most critical thing.

> Interviewee 13 (social learning-objective discussion): I think one of the big things would be to see good communication and positive communication on all sides of the issue. I know there's a lot of different stakeholders and a lot of different opinions and widely varying opinions. I think the biggest thing for me would just be to see just honest communication between all those stakeholder groups and just a sense of the diversity of opinions and being able to come to understandings to be able to move forward in positive directions with all that information.

> Interviewee 1 (social learning- personal experience): I focus on empathy because I think it's important for us to all understand one another and where everyone's coming from. The [focus] group that I was in seemed to be a lot of ranchers and I probably was included as a sportsman. It seemed like there was only one person in our group…well maybe two that were kind of proponents telling us why wolves would be good. And I think that was really good to have that diversity so that we can understand where everyone's coming from.

**Conflict Resolution.** The need to manage and reduce social conflict about reintroducing wolves in Colorado to find a path forward and make appropriate management decisions was referenced by nearly half of our interviewees ($n$ = 10). When discussing social conflict, participants primarily shared: (1) that it is CPW's responsibility, either CPW staff members themselves or through the use of the 3rd party facilitator, to manage the social conflict and (2)

that it is SAG member's responsibility to also be intentional in managing and deescalating conflict, with some participants sharing their de-escalation skills were a reason they applied to be on the SAG.

> Interviewee 17 (CPW responsibility): I think that CPW has the responsibility to set both the tone and the tempo of this process and conversations, in terms of not allowing it to escalate to fighting and bickering and to where all these different sides are just getting entrenched in their beliefs.
>
> Interviewee 11 (CPW responsibility): Another goal [for the process] would be to come to an understanding of what the most successful collaborative efforts would be to minimize potential social conflict.
>
> Interviewee 17 (SAG member responsibility): I think that what I felt like I would be able to contribute to [the SAG] is a slightly more nuanced and a slightly more neutral perspective, a less emotional perspective … I think that the ability that I have is to deescalate and take some of the emotions out of these very divisive issues and actually focus on the practical benefits for this state as a whole.

**Stakeholder Values.** Ten participants (41.7%) also discussed the importance of CPW's SE process leading to the incorporation of stakeholder and public perspectives, needs, concerns, and values in the final management plan, describing this in two primary ways: (1) goals for personal values perspectives to be reflected in the plan and (2) goals for their community's values, concerns, and needs to be integrated in the plan.

> Interviewee 23 (personal values): I think that the values questions are going to be really tricky. So for me personally, I expect to have no recreational hunting of wolves in Colorado, I'll be aiming for that, by using some of the language in the proposition.
>
> Interviewee 21 (community values): My dream would be that enough work can be done at a time listening to these Western slope communities so that when wolves do arrive, or supplemental wolves arrive, because we do have wolves here now, that the community will share some values around that…Some are going to have a really clear idea of expectations of what management actions will be taken and why.

## Inductive Stakeholder-Derived Criteria and Outcomes

### *Procedural Criteria*

**Intentional Two-Way Communication**. Two-thirds ($n$ = 16) of our participants described the need to build in formalized protocols for intentional two-way communication as a procedural criterion of the process rather than relying on conventional one-way information sharing. Specifically, participants discussed: (1) sharing updates and decisions about the TWG and SAG processes and about specific topics related to decisions for wolf reintroduction and management to educate the public; (2) protocols for two-way communication with TWG and SAG members, including for TWG and SAG members to communicate outside of the advisory groups and for the public to communicate into the advisory groups, and (3) communicating with 'boots on the ground' CPW (e.g., district wildlife managers) staff as a way to learn and to share needs, concerns, and questions with CPW.

> Interviewee 20 (sharing updates and decisions): I think there should be a huge investment in education… that way we can be like, things have changed around here, and we just want to make sure everybody understands why and what to do and why this is important… I would love to see [information] more accessible for people.
> Interviewee 11 (two-way communication with TWG and SAG): One of the early comments from the SAG meeting was that publics who attend those meetings are only given two minutes to express an opinion… The people who have the potential to be impacted at the local level really need to have sufficient time to express their concerns… I think it's important for CPW to make sure, through this process, that the general public feels that there is ample opportunity to have their thoughts and concerns expressed.

> Interviewees 21 ('boots on the ground' communication): I think Grand County is a small rural county…everybody knows their local [wildlife manager] and I think there is a lot of personal interaction happening up here. CPW folks are very accessible and recognized. When people ask me how they can get some information or share some thoughts, I just give them the phone numbers of local DWM's [district wildlife managers]… I think those one-on-one conversations with the DWM's and biologists are probably going to be most helpful.

**Active Inclusivity.** Nine (37.5%) of our participants described the need for active inclusivity, which they often described as going beyond representation, highlighting the need for

CPW to ensure inclusivity of all Coloradans and perspectives by incorporating mechanisms that address different barriers to participation in the process. These discussions typically related to the broader engagement efforts beyond the SAG and had two primary foci: (1) design elements that foster or hinder inclusivity, such as considering the location or timing of opportunities for the public to engage, the kind of opportunities for the public to engage, and the language being used and (2) systemic barriers to address in order to allow for the inclusion of those individuals and groups typically underrepresented in such CNRM SE processes and management decisions.

> Interviewee 4 (design elements that foster or hinder inclusivity): The general public is very comfortable with doing online comment… Farming and ranching communities, probably some sportsmen, those folks that are on the ground working, they're not necessarily comfortable with that. There needs to be more accessibility for folks that are on the ground. When they have time to comment, if they could actually speak to somebody instead of being routed to this comment form.

> Interviewee 12 (design elements that foster or hinder inclusivity): Folks who are going to typically be the ones that are, let's say, contrary to the situation, are going to be older folks, very conservative, and they probably don't enjoy zoom meetings. And they may not want to engage in too much travel. So CPW, DNR, Keystone policy group- meet these folks where they are.

> Interviewees 16 (systemic barriers to address): Specific outreach to the Latino community… Not saying that other groups shouldn't get outreach as well, but I know there's a lot of folks in Latino community where if it's a space that's very white, they may not feel like: 1) comfortable going and sharing and 2) like, is their voice really going to matter in this process?... I think that's something that agencies are going to unfortunately have to deal with just due to the history of things, how things have been status quo. So, I would say more outreach to the Latino community would be necessary for this because their voice, from what I can gather… is largely underrepresented in this discussion… But being cognizant of who they're tasking to do the outreach. I know some of the folks that helped organize some of those open houses, and they're really talented organizers, but they're also white and most likely not going to reach certain parts of the community… there's a bunch of great organizations out there or partners that they can partner with on this … but still very much community leaders… So just being aware of that messaging and who they task to do that outreach.

### *Social Outcomes*

**Trust in Agency.** Ten of our participants described their degree of trust in CPW and how the SE process may influence their, or other Coloradans', trust in the agency. These discussions focused on (1) elements that impact trust in the agency, such as how decisions were made, the SAG composition, and the ultimate wolf management plan and (2) pre-existing levels of trust in CPW and how this may impact perceptions of the SE process and wolf management plan.

> Interviewee 15 (elements that impact trust): Well, at this point, they've [western slope community members] been told they're not going to be heard. This is our backyards and for the state agencies, which we have really good working relationships with on other issues, to in our minds, arbitrarily chose not to include those voices that represent the citizens up and down the western slope, it came as a surprise.

> Interviewee 20 (pre-existing levels of trust): I think it would be great if CPW actually had a good relationship with the community. Which a lot of times I feel like they have a really good relationship with certain parts of the community, if you're an angler or a rancher, but if you don't fit that profile… CPW doesn't have strong relationships. So, I think it's up to CPW to kind of broaden their engagement and their relationship with communities and then once they have that relationship, it would be a lot easier to say, hey, we're going to do an education event on wolves.

> Interviewee 21 (pre-existing levels of trust): I'm also coming at this from a different perspective where I've been working with CPW here in Colorado for about 35 years… So, I have a great amount of trust and strong relationships with them already. I'm not coming from a place where I've had a bad encounter, or I don't trust them.

**Increased Support for the Final Management Plan.** Eight participants discussed how the SE process may influence acceptance of or increased support for the restoration and management plan. Participants described (1) aspects that may increase support, such as finding common ground across diverse perspectives and (2) aspects that may decrease support, such as the SAG not having the opportunity to build their own recommendations.

> Interviewee 24 (aspects to increase support): I think [the goal] is going to have to be to find some middle ground with those people that were for and against the amendment to make this acceptable by, I would say both sides but there's probably more than just two, but we'll call it two sides for now- the 'for' and 'against' wolf reintroduction, and if it's done appropriately, maybe [CPW] can achieve that.

> Interviewee 4 (aspects to decrease support): What I saw at that meeting, is the SAG being funneled into a position of rubber-stamping recommendations that came from the TWG and from an audience member observing that, it looked very poor… and when you're trying to get buy in from a process, you better open it up to start with… instead of pretending we're taking input and then shoving a plan out at the end, because there's not going to be support for the plan if this continues to unfold this way.

## Discussion

Our objective of this study was to explore the expectations that highly engaged external stakeholders have for an SE process for planning wolf reintroduction in Colorado. Participants described the importance of four of Young et al.'s (2013) PC, including representativeness, influence, independence (i.e., unbiased), and transparency. Through our analysis we inductively identified two additional stakeholder-derived criteria: (1) intentional two-way communication and (2) active inclusivity. Further, participants emphasized three of Young et al.'s (2013) SO of reducing social conflict, incorporating stakeholder values, and enhancing learning (specifically social learning), while also describing two additional SO of increasing trust in CPW and increasing support of the management plan. These stakeholder-derived SO, though missing from Young et al.'s (2013) SE evaluation framework, are well described in other literature on benefits of SE (Riley et al., 2018; Vaske et al., 2018) and were used in defining research objectives of our broader research program. Our findings build upon a growing body of scholarship to develop consistent metrics of success, which can be used across CNRM issues to evaluate SE processes (Reed, 2008; Santos & Chess, 2003; Talley et al. 2016; Young et al., 2013). Further, findings support Santos and Chess's (2003) claim that stakeholder-derived evaluation metrics (i.e., expected criteria and outcomes) may differ from those described in the literature and thus are important to identify for tailored design and evaluation purposes for a particular SE process.

By design, our participants were highly engaged in the issue of wolf reintroduction, but were external to the formal SAG process. Past research exploring stakeholder perspectives about SE processes has typically focused only on perspectives of those stakeholders formally involved in the process (Garard & Kowarsch, 2017; Santos & Chess, 2003). Yet, highly engaged external stakeholders can influence both the CNRM issue and public acceptance of management decision-making (Niemiec et al., 2020a; 2022). Moreover, achieving CNRM initiatives often requires widespread community support and compliance, thus it is important that highly engaged external stakeholders have confidence in the SE process and its outputs. As such, it may be necessary to identify SE process expectations of these external stakeholders in order to achieve the suggested benefits of SE processes (i.e., social outcomes of reduced conflict, support for management plans, enhanced trust, etc.) throughout these groups.

Our findings suggest that, when designing SE to be representative, practitioners should contemplate who to consider a stakeholder, thus who is going to be represented, and expressly share this with the public when selecting process participants. This finding is related to our findings on the PC of transparency, where several of our participants expressed frustrations regarding the perceived lack of transparency about how SAG members were selected and, relatedly. Similarly, there was a lack of clarity around who or which stakeholders should "count" in SE processes. Some shared the belief that the public deserves representation as a stakeholder given there was a public vote and that reintroduction will occur on public lands. Others believed that those who are most likely to be negatively affected by wolf reintroduction such as west slope residents and ranchers, should have more representation in the process and outcome. Identifying who is considered a stakeholder is given much attention in the literature and there are a multitude of stakeholder analysis methods that can assist practitioners in pursuing representativeness (see

Colvin et al., 2016 and Sharpe et al., 2021 for detailed reviews on techniques and selection criteria). Generally, 'stakeholders' are defined as actors who affect or are affected by decisions and represent a specific collective interest; while 'publics' are seen as those who represent the public good and do not affect, and are not directly affected by, decisions but who still interact with the given issue (Colvin et al., 2016; Reed et al., 2018). However, given that wildlife in North America is considered a public trust resource, meaning the government acts as a trustee to manage wildlife for the public (Organ et al. 2012), some scholars argue that wildlife agencies should incorporate all beneficiaries' (i.e., all citizens') perspectives and interests into decision-making (Decker et al., 2016). A key take-a-way from the literature is that it is critical for managers to explicitly articulate the selection criteria being used to choose process participants during the recruitment stage (Sharpe et al., 2021; Talley et al., 2016).

Nearly half of our participants discussed the need for the process to provide SAG members, stakeholders, and the public opportunities for "meaningful input" into the final restoration and management plan (i.e., the criterion of influence). This finding is reflected in the CNRM literature which suggests that ensuring participants believe they genuinely influenced (or had the opportunity to influence) decision-making is important for achieving stakeholder satisfaction and other social outcomes, including increased trust and reduced conflict (Madden & McQuinn, 2014; Talley et al. 2016; Reed, 2008). Santos and Chess (2003) conducted interviews with stakeholder advisory group members in two case studies and found that, in both cases across all stakeholder groups, process participants viewed legitimately impacting decision-making as a key metric of success. Despite our participants' emphasis on influence, no individual provided a thorough description of what they believed "meaningful input" meant outside of having the opportunity to share their perspectives with those involved. Definitions of

"meaningful input" into decision-making are equally vague in the SE literature (Reed, 2008; Santos & Chess, 2003; Talley et al. 2016; Young et al., 2013). However, frameworks like Luyet et al.'s (2012) five levels of public participation can provide insight into degrees of influence wherein there is limited opportunity to influence processes and outcomes in the first two levels but the degree of influence increases in the final three levels: collaboration, co-decision, and empowerment. Though participants did not expand on what meaningful input *is*, some participants did describe what they believe it is *not*. For example, one participant explained what they interpreted as the SAG "rubber-stamping" recommendations put forth by the TWG which shaped their perspective that the criterion of influence was not being met. Identifying how stakeholders and managers define "meaningful input" is an important future research direction on SE processes.

Our stakeholder-derived procedural criteria, which include the need for the agency to integrate mechanisms for two-way communication with Coloradans and to remove barriers to participation to increase inclusivity, provide insight into how practitioners can ensure external stakeholders feel represented in the process and believe they had the opportunity for meaningful input. It is possible that these stakeholder-derived criteria emerged in our study, but were not part of Young et al.'s (2013) SE framework, because we intentionally engaged with external stakeholders. Several participants emphasized the importance of interactions with "boots on the ground" CPW staff and district wildlife managers as critical for this two-way communication, highlighting how these CPW personnel are already entrenched in communities throughout Colorado and often have good working relationships with constituents. Conversely, several participants described how negative interactions or poor pre-existing relationships with CPW personnel can reduce trust in the process and the degree to which diverse groups will engage

with the process. These findings suggest the importance of formalized communication within the agency with 'boots on the ground' staff to learn about pressing community concerns and questions and to ensure all CPW personnel are prepared for SE on controversial wildlife issues. Future research should explore the extent to which these criteria emerge, both among external stakeholders and process participants, in a variety of CNRM contexts.

The negative experiences with CPW personnel that some participants described also highlights the importance of additionally implementing the stakeholder-derived criterion of active inclusivity. Participants described active inclusivity as giving attention and removing systemic barriers to participation and representation, such as poor-preexisting relationships with certain stakeholder groups. Some participants described certain stakeholder groups, such as recreationists and animal welfare interests, as underrepresented on the SAG compared to hunting and ranching constituents. The latter were described by participants as receiving more attention from the agency due, in part, to the typical funding structures of state agencies (Johnson et al., 1993; Nie, 2004; Larson et al. 202) and representation on the Colorado Parks and Wildlife Commission. Several participants also described systemic barriers to BIPOC community participation and provided suggestions for enhancing their involvement, such as working with BIPOC community leaders to conduct engagement. It is well described in the literature that CNRM is typically dominated by white, affluent males and there is ample evidence of excluding BIPOC communities from important environmental initiatives (Jones & Solomon, 2019; Martin, et al., 2016). Removing such barriers and ensuring representation of marginalized groups is vital to pursuing environmental justice (Martin, et al., 2016; Paloniemi et al., 2015). This call for CPW to actively include broader constituency is not a concern in Colorado alone but one that conservation organizations face across the U.S. (AFWA, 2019; Nie, 2004). If wildlife

management agencies are going to continue to garner public support and meet the needs and interests of diverse constituencies, it is critical that they strengthen efforts to engage broader audiences (AFWA, 2019; Decker et al., 2016). Thus, important areas of research might explore factors that influence boundary expansion to broaden agency engagement with atypical constituents and processes for pursing environmental justice and decolonizing conservation in the west (Jacobsen et al., 2022).

When discussing social outcomes included in Young et al.'s (2013) SE framework, participants shared the expectations that the SE process will foster social learning across the disparate perspectives Coloradans have about wolves and their management and reduce the conflict about wolf reintroduction. In particular, many participants viewed it as CPW's responsibility to manage the conflict about wolf reintroduction and enhancing social learning may be one way to accomplish this. SE processes bring people together to create a shared understanding of the issue, explore differing objectives and management options, and make decisions about important societal issues; hence, learning about each other's perspectives is necessary for such collaborative work (Pahl-Wostl & Hare 2004; Schusler et al., 2003; Tippett et al., 2005). Thus, social learning in this context may be necessary to achieve conflict reduction because elements of social learning, including intergroup contact, perspective taking, and empathy building, are also important for conflict reconciliation (Cehajic-Clancy et al., 2016; Daniels & Walker, 2006; Madden & McQuinn, 2014; Schusler et al., 2003; Tippett et al., 2005). For example, when describing social learning one of our participants, who attended a focus group, noted how participating in the SE process enhanced her own empathy with those who have a different view about wolf reintroduction than she did, and increasing empathy is integral to reducing conflict (Cehajic-Clancy et al., 2016). There is a wealth of research showing that

carefully designed SE processes can achieve conflict resolution (Madden and McQuinn, 2014; Zimmerman et al., 2020), but that the negative emotions that fuel conflict must be managed through interventions that target the perceptions about the outgroup, ingroup, and nature of the conflict (Bar-Tal, 2000; Cehajic-Clancy et al., 2016; Gonzalez et al., *In Prep*; Lute & Gore, 2014).

In addition to the social outcomes in Young et al.'s (2013) SE framework, our participants discussed the social outcomes of trust in CPW and the potential of the SE process to enhance support for the final management plan. The potential for SE processes to increase trust in management agencies is well documented in the literature (Davis et al., 2018; Madden & McQuinn, 2014; Riley et al. 2018; Vaske et al., 2018). For example, Riley et al., (2018) surveyed over 2,000 Michigan hunters and found that perceptions of procedural fairness, which they defined as the processes and procedures used by the agency to make decisions, were more important in predicting trust than perceptions of the agency's technical competence. Several of our participants also shared how preexisting levels of trust in the agency may influence individuals' willingness to participate in SE and collaborative processes. This appeared to be especially relevant to those stakeholders who perceived themselves as part of typically underrepresented groups. Thus, to enhance trust, state agencies should target these typically underrepresented groups and ensure their representation and inclusion. Support for and cooperation with management decisions and policies is closely linked to trust, where trust in an agency is viewed as a predictor of support (Riley et al., 2018; Vaske et al., 2018). A wealth of research suggests SE and collaborative processes in CNRM result in increased support for and compliance with management decisions (Davis et al., 2018; Madden & McQuinn, 2014; Riley et al. 2018). Understanding influencers to (non)compliant behaviors is critical to achieving CNRM

initiatives and continued exploration of how SE processes may increase support and compliance with environmental policies is an important future research direction.

Despite emphasis in the literature of increasing trust in management agencies as a potential outcome of SE, Young et al.'s (2013) SE framework did not include this as an outcome, rather it included increased trust in other stakeholders which our participants did not discuss. Some literature suggests that agencies are one type of stakeholder in CNRM initiatives, and it could be that these authors grouped relevant agency personnel as stakeholders in this way. Deciding whether or not to include relevant agencies as stakeholders in SE processes is a consideration for practitioners. Benefits of doing so might include encouraging social learning and conflict reduction amongst agency personnel and other participants and reducing the perception by stakeholders that the processes is biased toward a predetermined outcome. However, some of our findings, such as suggestions that it is CPW's responsibility to reduce social conflict, to be transparent, and to pursue active inclusivity, imply that stakeholders place different expectations on the state agency than on other stakeholders and thus agency participation as 'just another stakeholder' may not be feasible.

Several PC and SO in Young et al.'s (2013) SE evaluation framework were not discussed, or were minimally discussed, by our participants. In some cases, it may be that these were not applicable to our study. For example, the outcome of technical quality may not have come up because our interview questions were specific to the SAG and public involvement process and not about the TWG whom developed the technical recommendations for the wolf management plan. However, for some criteria and outcomes, the lack of discussion may be due to how closely related some of these constructs are. For example, only one participant shared the belief that the SE process may help increase trust among stakeholder participants. This should not imply that

trust in other stakeholders is an unimportant outcome. Rather, we would argue that this construct is more closely linked to other social outcomes, such as reducing social conflict and enhancing social learning, which many participants discussed. There is a wealth of research suggesting that conflict reconciliation is predicated upon trust and relationship-building (Bar-Tal, 2000; Cehajic-Clancy et al., 2016) and that social learning can enhance trust (Pahl-Wostl & Hare 2004; Schueler et al., 2003). Research exploring the complex relationships among these social outcomes could help practitioners better achieve such outcomes through SE.

There are several opportunities for future research to further interpret and build upon our findings. First, the present study constitutes one piece of the first phase of a longitudinal analysis. We conducted these interviews at the start of a two-year SE process; thus, our findings highlight expectations about and perceptions of the process before it ended. It is likely that perceptions of which criteria were implemented successfully, and which outcomes were achieved, will be different at commencement of the process. Secondly, we focused on stakeholders highly engaged in the issue of wolf reintroduction who informally participated in various aspects of the state agency's broader public engagement efforts, but who were not formally part of the SE process as an advisory group member. Our ongoing work will seek to explore SAG members' expectations, and we hypothesize that highly engaged internal stakeholders will prioritize different criteria and outcomes. Comparing perceptions of and expectations for SE processes between those directly involved in and those external to the process could provide important insight into how agencies can effectively focus their efforts to achieve desired social outcomes across stakeholders with varying levels of involvement. Finally, given the vast array of procedural criteria that can be used to design SE efforts, an interesting future research direction could be to experimentally design

SE processes with various procedural criteria and empirically test which social outcomes are achieved.

# CHAPTER III: CHARACTERIZING SOCIAL CONFLICT OVER WOLF REINTRODUCTION IN COLORADO: A THEORETICAL MODEL OF INTERGROUP CONFLICT

## Introduction

Human-wildlife conflicts are considered one of the most widespread intractable conflicts observed globally (Dickman, 2010; Nie, 2004; Redpath et al., 2015). Although direct negative impacts to human endeavors, such as depredation, crop raiding, and wildlife damage, are often cited as the catalyst for human-wildlife conflict (Redpath et al. 2015; Sillero-Zubiri & Laurenson, 2001), increasingly research shows that social disputes, such as value clashes (Manfredo et al., 2017); power relations (Redpath et al., 2013), or identity-based conflicts (Madden & McQuinn, 2014), are more influential in driving conflict with wildlife than the negative impacts to human endeavors (Dickman, 2010; Young et al., 2015). Redpath et al., (2015) conducted a systematic review of publications framed as human-wildlife conflicts since 2010 and identified that, out of 100 papers, 97 publications actually focused on conflicts between people about wildlife, rather than conflicts between people and wildlife. Research suggests that conflicts about wildlife are often symbolic of threats to deeper human needs such as security, respect, identity, and freedom (Amel, 2017; Madden & McQuinn, 2014) and are exacerbated by broader discordance over race, health, politics, livelihoods, and economic disparities (D'Estree et al., 2002).

Large carnivore restoration is an especially polarizing and contentious wildlife management issue (Bruskotter et al., 2013, 2017; Lute et al., 2020; Salvatori et al., 2020; van Eden et al., 2017). Intergroup conflict, which is conflict between different groups, over how to manage carnivores can impede management objectives and long-lasting success (Dickman,

2010), prevent future collaboration and cooperation among stakeholders (Madden & McQuinn, 2014; Nie, 2001), and lead to prolonged and costly environmental litigation (Orr et al., 2008). Moreover, when groups perceive wildlife managers to privilege certain stakeholders over others, or make decisions that are contradictory to their values or perceived as harmful to their wellbeing, trust in wildlife management agencies may decline and groups may seek alternative pathways to be heard (Jacobson et al., 2017; Madden & McQuinn, 2014; Nie, 2004). In the past, conflict over carnivore management has resulted in ballot initiatives to halt mountain lion hunting in California, Oregon, and Washington (Nie, 2004) and to reintroduce wolves (Niemiec et al., 2020a) and reform black bear hunting practices in Colorado (Loker & Decker, 1995).

Intergroup conflict about CRM can result in lethal control and at times retaliatory killings of carnivores (van Eden et al., 2020; Woodroffe & Ginsberg,1998). This persecution, paired with habitat loss and fragmentation, urban sprawl, and reduced prey populations (Bruskotter et al., 2017; Crooks et al., 2011), has led to widespread declines in carnivore populations (Bruskotter et al., 2017; Dickman et al., 2013; Ripple et al., 2014; van Eden et al., 2018). Thus, pursuing human-carnivore coexistence necessitates managing such intergroup conflict (Venumière Lefebvre et al., 2022). Despite this need, Venumière-Lefebvre et al. (2022) identified, in a systematic review of 366 papers on human-carnivore coexistence, only 30.9% of articles explored the intergroup conflict aspect of coexistence.

Within the CNRM literature, there has been a growth in the use of SE processes to address intergroup conflicts. Such processes typically emphasize negotiation about the substance of the conflict to reach a settlement or agreement (Zimmerman et al., 2020). One such example is the Environmental Conflict Resolution (ECR) framework which typically plays out in the adversarial arena where a third-party mediator intervenes with a negotiation and agreement

seeking process (Orr et al., 2008). Frameworks like ECR approach conflict as transaction, where actors negotiate for the primary purpose of having as much of their needs, concerns, and values represented in the solution as possible, even to the detriment of the others. However, these types of negotiation processes do not address the value and identity-based components that are at the root of intractable conflicts (Emerson et al., 2009; Madden and McQuinn, 2014; Zimmerman et al., 2020). Additionally, moving into a negotiation or settlement process before reconciliation occurs and before trust is built may even further damage intergroup relations and exacerbate the conflict (Zimmerman et al., 2020). The pervasiveness of processes that focus on negotiation and settlements may be one reason why complete long-lasting wildlife conflict resolution is rare (Dickman, 2010; Zimmerman et al., 2020).

Intergroup conflicts about carnivores necessitate interventions that address the value and identity-based drivers of the conflict and repair intergroup relations before agreements can be reached (Madden & McQuinn, 2014; Zimmerman et al., 2020). For example, Hurst et al., (2019) suggest using moral foundation theory (i.e., sharing ingroup's moral values with outgroup members) and self-affirmation theory (i.e., affirming the ingroups' self-integrity) as interventions at the beginning stages of a broader SE process to mitigate conservation conflicts fueled by identity threats. Processes meant to address deeper identity-based conflicts should allow for open dialogue and deliberation in order to foster the perspective-taking, empathy-building, and relationships needed to repair intergroup relations (Beirele, 2002; Reed, 2008; Young et al., 2013). These processes are often collaborative in nature and focus on social learning and group exploration of the symbolic, identity-based factors driving the conflict (Madden & McQuinn, 2014). Despite calls for these more intensive reconciliatory processes to address intergroup conflicts about carnivores (Lute & Gore, 2014; Madden & McQuinn, 2014; Zimmerman et al.,

2020), there is a gap in the conservation and natural resource management literature detailing how to identify the drivers of identity-based conflicts and how to develop reconciliation interventions to target those drivers.

**Statement of Purpose**

We apply our theoretical model of intergroup conflict that we adapted from theories in the conflict and peace-building literature to the case study of gray wolf reintroduction in Colorado. This application serves two purposes. The first is to characterize the psychological drivers of this specific intergroup conflict. In the short-term, this research may assist wildlife managers throughout Colorado to develop conflict reducing processes that target the identified drivers. The second purpose is to bring theory on the social-psychological drivers of conflicts from other fields into the CNRM literature. Studies of religious and political conflicts have identified a wide range of social-psychological factors that can drive or help de-escalate conflict; however, these have rarely been examined to understand wildlife or CNRM (Bar-Tal, 2007; Cehajic-Clancy et al., 2016). Examining the extent to which these drivers apply in this new context could help identify novel interventions to address these drivers to reduce conflict.

Our specific research questions are as follows:

1. To what extent do various categories of social psychological drivers adapted from conflict and peace building literature in other fields apply to stakeholders' understanding of the conflict about proposed wolf reintroduction in Colorado?
2. To what extent do the prevalence of different types of perspectives vary across stakeholders who have different positions within the conflict?
3. What specific perceptions within different categories of drivers are most or least prevalent when stakeholders are describing the conservation conflict?

**Conflict about Gray Wolf Restoration and Management**

Wolves once inhabited most of North America, but as a result of government sponsored predator control programs, paired with diminishing habitat and pray populations, wolves were exterminated from most of their historic range in the lower 48 U.S. states (Bruskotter, 2013; Mech, 2017). After becoming a protected species under the Endangered Species Act (ESA) of 1973, wolves began repopulating the West through natural migration and reintroductions in Western states in the late 20th and early 21st centuries (Bruskotter, 2013; Mech, 2017). After initial ESA listing, wolves across U.S. states have been delisted and relisted both at the federal and state levels and public policy has seen a 'pendulum swing' between overprotection and overharvest (Bruskotter, 2013). The public debate about wolves, and the associated changes in management policy, illustrates the polarized views the U.S. populace has toward wolves. Research suggests that wolves have become a symbol of social divides, such as urban versus rural values, and a surrogate of broader societal-level political and moral conflicts, such as perspectives toward states' rights versus federalism and conservative versus liberal values (Niemiec et al., 2020a; 2022; Slagle et al., 2019). Wolf advocates often support their position with arguments of restoring ecological balance and environmental health, suggesting that wolf recovery and protection is a moral imperative, and that people should right past wrongs and make amends with the wilderness (Crooks et al., 2022; Kellert et al., 1996; Niemiec et al., 2020a; 2022). Conversely, those opposed to wolf restoration see wolves as a threat to rural livelihoods and identity, livestock, game species, and people and pets and as a tool of an overreaching government (Kellert et al., 1996; Niemiec et al., 2020a; 2022).

Colorado is an exemplary case of this public policy debate about wolf restoration and management. Wolves were extirpated from Colorado by the 1940's and nearly 80 years later

environmental organizations advocating for wolf recovery obtained enough signatures to introduce a ballot initiative (Proposition 114) that would reintroduce wolves into the state. In November 2020 Proposition 114 passed with about 51% of the votes in support of reintroduction (Colorado Election Results, 2020), marking the first time in the U.S. that the decision to reintroduction an endangered species was decided by voters via a ballot initiative. CPW is now mandated to reintroduce wolves into the state beginning no later than December 31st, 2023. This process, from gathering signatures through the passing of the initiative and development of the wolf restoration and management plan, has been steeped with controversy (Niemeic et al., 2022). During signature gathering, in anticipation of the vote, we began research in 2019 before reintroduction was officially on the ballot in order to obtain baseline data on stakeholder perspectives toward reintroducing wolves into Colorado via a 2020 ballot initiative. Additionally, our team organized a stakeholder workshop in February 2020 with the aim of laying the groundwork to minimize stakeholder conflict if the ballot initiative passed. The research conducted in this study was meant to help inform the development of this workshop and to understand the perspectives of stakeholders central to this conflict.

**Theoretical Model of Intergroup Conflict**

To characterize the intractable intergroup conflict about wolf restoration and management, we depended on social-psychological theories of reconciliation developed from peace-building efforts in religious and political intractable conflicts. On the social conflict spectrum, intractable conflicts are the most intense, can be violent, and are long-lasting, typically beyond one generation. Further, they are seen as zero-sum in nature, irresolvable, and as central to the identity of at least one group involved (Bar-Tal, 2007). Reconciliation is described as a psychological process that necessitates actors partake in cognitive activities to reframe their

beliefs related to their own group's goals and perspectives, beliefs of the other group's goals and perspectives, and beliefs about the conflictive environment (Bar-Tal, 2000). As detailed in the literature, there are four primary categories of perceptions most relevant in an intergroup conflict that should be targeted through reconciliation interventions (Figure 3; Bar-Tal, 2000; 2007; Bohm et al., 2018; Cehajic-Clancy et al., 2016). First, there are perceptions of the *ingroup*, which is a collective of like-minded individuals with whom you share membership. Second, there are perceptions of the *outgroup,* or groups comprised of those with differing attitudes, values, beliefs, and norms from your own. Third, are the perceptions about the *nature of the conflict*, which relate to beliefs about how and why the conflict started, and if and how it can end. Lastly, there are perceptions of *intergroup relations,* which include the history, the current state, and the future of the relationship between those entrenched in conflict. Here, when using the term 'perceptions', we follow Bennet et al.'s (2016) definition perceptions "refer to the way an individual observes, understands, interprets, and evaluates a referent object, action, experience, individual, policy, or outcome" (p. 585). Therefore, when using 'perceptions' we mean to encompass the variety of specific values, beliefs, attitudes, norms, and views that act as psychological drivers of conflict.

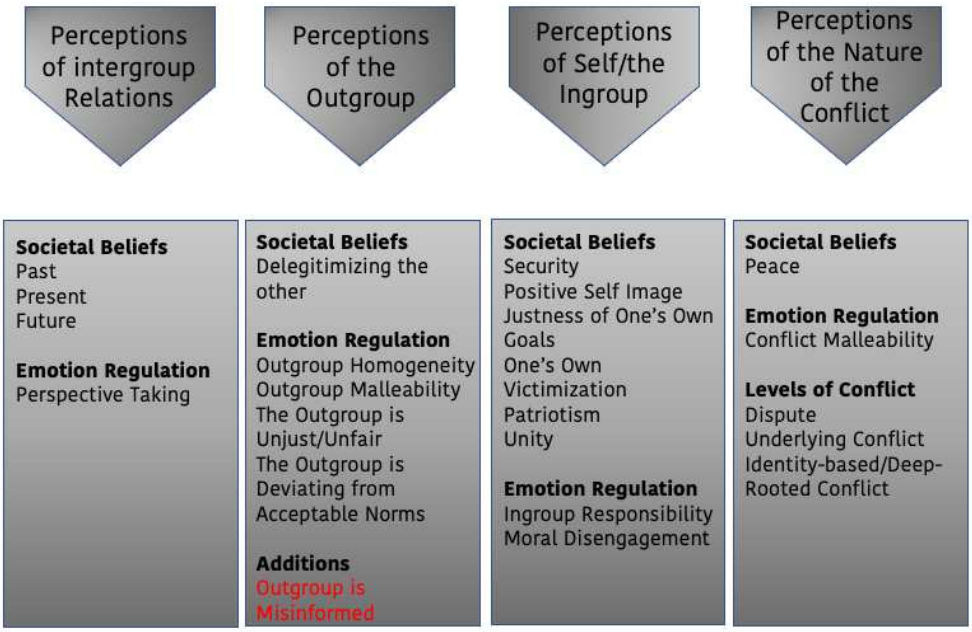


Figure 3**.** The specific perceptions we coded for in this analysis, grouped into the four primary categories of perceptions. The specific perceptions deductively derived from the two theories we adapted our model from are in black and the one perception we inductively identified from our first cycle coding is in red.

To identify specific perceptions that drive conflict, within the four primary categories of perceptions, we adapted a theoretical model of intergroup conflict based on two theories that detail successful social-psychological interventions for conflict reconciliation. The first theory is Bar-Tal's (2007) *sociopsychological infrastructure of intractable conflicts* which proposes that those societies entrenched in national, multi-generational conflicts construct a collective psychological infrastructure that represents a conflict narrative. This conflict narrative allows individuals within society to understand the conflict and their place in it and to cope with the realities of the conflict. Further, the conflict narrative represents a shared repertoire of perceptions, motivations, and emotions, organized into three elements: collective memory, ethos of conflict, and collective emotional orientations (figure 4).

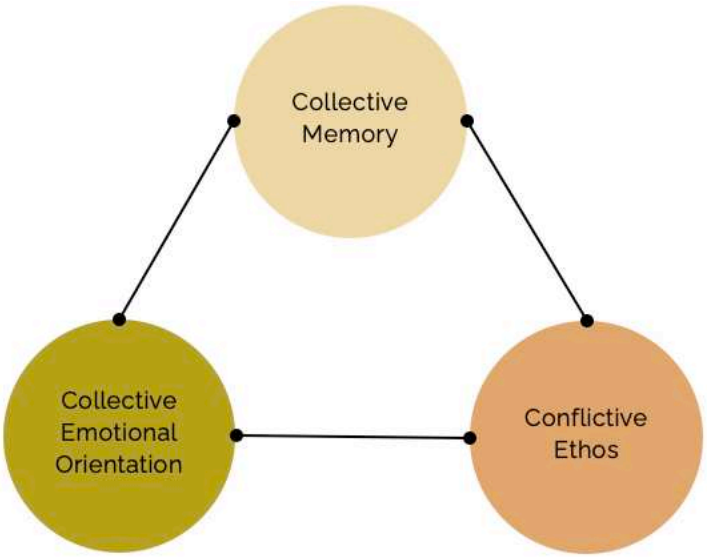


Figure 4**.** Bar-Tal's (2000; 2007) sociopsychological infrastructure of intractable conflicts. This infrastructure represents a group's conflict narrative, organized into three elements: collective memory, ethos of conflict, and collective emotional orientations.

A collective memory develops over time and is a narrative about the past that creates a selective and biased version of the history of the conflict from that group's perspective. The ethos of conflict is the narrative at a given present state that of the dominant societal beliefs and shapes the orientation and goals of that group. The collective memory and conflictive ethos are comprised of eight themes of societal beliefs that frame these elements of the conflict narrative: justness of one's own goals, security, positive self-image, one's own victimization, delegitimization of the opponent, patriotism, unity, and peace. Specific perceptions (e.g., how do groups justify their goals and actions? How do groups frame what peace looks like? How do groups build their positive self-image?) within these eight themes shape the reality of those experiencing conflict and greatly impact individual-level decisions and behaviors as well as courses of action taken at the group or societal level. Lastly, the collective emotional orientation element suggests that emotions can drive conflict and that individuals can share emotions with others in their group and experience emotions on behalf of others. Therefore, repairing

intergroup relations necessitates deconstructing each groups' conflict narrative and identifying and altering the specific perceptions (i.e., the themes of societal beliefs, see figure 3) that fuel the conflict.

The second theory we utilized in the construction of our model builds upon the third element of the conflict narrative, collective emotional orientations, and is called the *emotion regulation perspective* (Cehajic-Clancy et al., 2016). This theory posits that emotions are powerful drivers of behaviors, and they are shaped by, and shape how we experience, our environment and others. Emotion regulation is a psychological mechanism for pursuing reconciliation and is achieved through targeting specific perceptions to influence individuals' emotional experiences and expressions (i.e., which emotions they have and when they have them). Cehajic-Clancy et al. (2016) posit that reconciliation can be achieved by targeting the perceptions that fuel hatred, anger, guilt, hope, and empathy, the emotions most pertinent in intractable conflicts. They discuss various types of specific perceptions related to the ingroup, outgroup, and nature of the conflict that lead to the above emotional responses. By targeting those perceptions in an intervention, positive intergroup emotions can increase while negative intergroup emotions can decrease. For example, individuals typically perceive members of outgroups as homogenous, or as all having the same goals, opinions, and attributes. In a conflict context this view often results in the perception that all members of the outgroup are inherently bad and unmalleable which can perpetuate and exacerbate feelings of anger and hatred both of which are barriers to reconciliation. Therefore, these authors argue, to decrease feelings of hatred for outgroup members the intervention should target perceptions of outgroup homogeneity by increasing perceptions of outgroup malleability and moral variability.

The first category of perceptions in our theoretical framework includes *perceptions of the self and the ingroup*. Within this category we've included six themes of societal beliefs from Bar-Tal's (2007) *sociopsychological infrastructure of intractable conflicts*. Here we explore how individuals frame their, and their ingroup's, actions and motivations through the themes of justness of their goals, security, positive self-image, their victimization, patriotism, and unity. From Cehajic-Clancy et al.'s, (2016) *emotion regulation perspective*, we have included the perceptions of ingroup responsibility and moral disengagement to explore if and how individuals see themselves as actors in creating and perpetuating the conflict. The second category, *perceptions of the outgroup*, includes the societal belief of delegitimizing the other, from *sociopsychological infrastructure of intractable conflicts,* and four perceptions from the *emotion regulation perspective*. These include outgroup homogeneity (i.e., are members of the outgroup perceived as all the same), outgroup malleability (i.e., are members of the outgroup perceived as capable of changing), the outgroup is unjust and unfair, and the outgroup is deviating from acceptable norms. These themes of outgroup perceptions allow for the characterization of how individuals frame the "other" in their conflict narratives. Our third category includes *perceptions of intergroup relations* and, from the *sociopsychological infrastructure of intractable conflicts*, includes perceptions of past, present, and future intergroup relations, and from the *emotion regulation perspective,* includes if and how individuals engage in perspective-taking.

In our final category, perceptions of the nature of the conflict, we included one theme of beliefs each from each of the two theories (Bar-Tal, 2007; Cehajic-Clancy et al., 2016). First, we include what a state of peace looks like from each group's perspective and second, we included whether or not individuals believe the conflict situation can change (i.e., is the conflict malleable). It is important to note that *perceptions of the nature of the conflict* also include

perceptions related to the 'substance' of the conflict, which are those perceptions of the actual issues being disputed by both parties (Madden & McQuinn, 2014). However, perceptions of the specific issues surrounding wolf conservation and management are not within the purview of this paper. As such, here we focus specifically on inter and intra-group perspectives as our unique contribution to the extensive body of literature that describes the substance of intergroup conflict about wolves (e.g., see Nie, 2002; Niemiec, 2020a; 2022; Van Eeden et al., 2017; Zimmerman et al., 2020). We describe the substance dimensions of the intergroup conflict surrounding wolf conservation and management in Colorado, using the same data, elsewhere (Gonzalez et al., In Prep).

## Methods

### Stakeholder Workshop

To develop insight into how to reduce stakeholder conflict over proposed wolf reintroduction into Colorado, our research team at Colorado State University's Center for Human-Carnivore Coexistence organized a two-day stakeholder workshop, facilitated by the Center for Conservation Peacebuilding (CPeace). The aim of the workshop was to begin laying the groundwork to minimize stakeholder conflict and facilitate coexistence should wolves be reintroduced to Colorado. The specific objectives of the workshop were to: facilitate an open dialogue about diverse perspectives with the hopes of beginning to develop mutual trust and respect, understand how stakeholders would like to be involved in decision-making if wolf reintroduction were to occur, and identify needs and priorities for future action related to wolf reintroduction and management. In advance of the workshop, we conducted interviews with the workshop invitees to understand stakeholder's perceptions, concerns, and priorities.

**Participant Recruitment and Categorization**

We used purposive sampling (Etikan et al., 2015) to recruit stakeholders that represent the key interests in the debate over wolf reintroduction in Colorado and we also included scientists or opinion leaders with specific knowledge about wolf restoration and management. Our goal was to interview the 35 stakeholders we invited to the workshop, whom we recruited from October 2019 to January 2020. In total, we conducted 22 interviews; seven of which were conducted in person, 14 over the phone, and one was provided via written responses for a response rate of 62.9%. However, one interview recording was damaged and the written respondent chose not answer questions about social conflict. Thus, 20 interviews are included in this analysis. All interviewees were at least18 years old and lived and worked in Colorado at the time of the interviews, except for two who were federal biologists from other states. All procedures were approved by Colorado State University's Institutional Review Board (protocol #19-8942H).

**Interview Guide Development**

The interview guide was developed in collaboration with CPeace's executive director and primary facilitator, Francine Madden. As such we organized the interview questions around the framework used by CPeace, the Conservation Conflict Transformation framework, which gives equal attention to the three primary dimensions of conflict, including: the process, such as how communication occurs, how decisions are reached, who makes decisions, who is included, and who has authority; the substance, which refers to the actual elements and components of the conflict itself; and relationships, such as the quality of the relationships and the level of trust and respect that exists between the individuals or groups in conflict (Madden & McQuinn, 2014).

The topics covered by our interview questions included participants' general perspectives of proposed wolf reintroduction, the use of ballot initiatives for wildlife management, perceptions of human carnivore coexistence, and thoughts regarding the nature of the stakeholder conflict. The interview questions related to social conflict were designed to identify drivers of conflict as related to perceptions of the nature of conflict context, the ingroup, the outgroup, and intergroup relations. The items analyzed in this paper include variations of the following three questions: *Can you tell me what you think about the idea of wolf reintroduction that is being discussed here in Colorado? Can you tell me about the conflict about wolves and wolf reintroduction here in Colorado? Who do you think is involved in this conflict? Do you know someone or a certain group with an opposite point of view on this issue that you would feel comfortable talking to about wolf management and recovery?* The variation in use of these questions was due to the conversational flow of semi-structured interviews and, depending upon the breadth and detail of participants' initial response, a number of follow-up questions were asked. We designed the follow-up questions to allow for thorough characterization of the intergroup conflict context here in Colorado. See table six for the possible follow-up questions for the three primary questions.

Table 6**.** Primary interview questions related to characterizing the social conflict of wolves in Colorado along with potential follow-up questions for each.

| **Primary Question and Possible Follow-up Questions** |
|---|
| *Can you tell me what you think about the idea of wolf reintroduction that is being discussed now in Colorado?*<br>• Do you think this conversation has been fair and inclusive? |
| *Tell me about the conflict over wolves and wolf reintroduction here in Colorado. Who all is involved in this conflict?* |

- Have you talked to anyone within your community (or agency) that sees this issue of wolf reintroduction differently than you've discussed so far?
- You mentioned "them" [folks from an outgroup]- who is "them" in your mind?
- What are your views on the groups who [support/oppose] this [choose opposite to interviewees point of view]?
- What do you think is motivating their [opposition or support]?
- Do you think they would listen to or respect your point view on this issue?
- Do you think they would be willing to talk with you or compromise on this issue?
- In the past, have they changed their mind/position on an issue as a result of learning from your group?

*Do you know someone or a certain group with an opposite point of view on this issue that you would feel comfortable talking to about wolf management and recovery?*

- When issues come up related to wildlife management, would you ever consider reaching out to "them" [person/group with an opposite point of view] to work together to solve problems?
- Have you ever reached out to "them" [person with opposite point of view] to solve wildlife management problems?
- Can you imagine circumstances where you might reach out to someone from groups on the opposite side of a wildlife management issue?
- How receptive do you think people from those other groups are to wanting to solve problems with you?

**Analysis**

***Participant Categorization***

We categorized our interviewees into one of nine broader stakeholder groups (table 7) which included: one western slope rancher; three Colorado state employees from either Colorado Parks and Wildlife or Colorado Department of Agriculture; two academics who were either faculty or worked for an academic center at a university; three federal wildlife biologists; four environmental NGO representatives; one CPW commissioner; three sportspersons or outfitters; one animal welfare NGO; and two Tribal Nation representatives. We additionally classified participants into one of three subgroups related to their positions in the conflict about proposed wolf reintroduction. This includes those that clearly shared the position of supporting wolf reintroduction, those that clearly shared the position of opposing wolf reintroduction, and those that represented a middle-ground or 3rd-party perspective.

We used two approaches to classify participants into one of these three subgroups. First, we used their response to "*What do you know about the proposed ballot initiative for reintroducing wolves into Colorado? Do you support or oppose such an initiative?*" to identify their self-reported stance on wolf reintroduction. Second, we assessed valence (i.e., the positive or negative appraisal that underpins affect; Shuman et al., 2013) of statements related to wolves, their reintroduction, their management, and their potential impacts to people, other animals, and Colorado. We assessed valence in four categories: positive, negative, mixed, and neither (Kent et al., 2016). If approximately 70% or more of their relevant statements had a positive valence and tone, we included them in the subgroup of those that support reintroduction and, conversely, if 70% or more of their relevant statements had a negative valence and tone, we included them in the subgroup of those that oppose reintroduction. Lastly, for those who either discussed relative statements with positive and negative valence at roughly equal rates, or for those who shared a very neutral perspective avoiding a strongly positive or negative tone altogether, we grouped them into the middle-ground perspective subgroup.

Table 7**.** Each interviewee, their position in the conflict, and their stakeholder group.

| **Position** | **Interviewee** | **Stakeholder Group** |
|---|---|---|
| Middle-Ground Perspective | | |
| | Interviewee 1 | Colorado State Employee |
| | Interviewee 2 | Academic |
| | Interviewee 3 | Federal Biologist |
| | Interviewee 4 | Academic |
| | Interviewee 5 | Colorado State Employee |
| | Interviewee 6 | Environmental NGO |
| | Interviewee 7 | Sportsman/Outfitter |
| | Interviewee 8 | Sportsman/Outfitter |
| | Interviewee 9 | Tribal Government |
| | Interviewee 10 | Federal Wildlife Manager |
| Those Who Support Reintroduction | | |
| | Interviewee 11 | Environmental NGO |
| | Interviewee 12 | Animal Welfare NGO |
| | Interviewee 13 | Environmental NGO |

| | | |
|---|---|---|
| | Interviewee 14 | Tribal Government |
| | Interviewee 15 | Environmental NGO |
| | Interviewee 16 | Federal Biologist |
| Those Who Oppose Reintroduction | | |
| | Interviewee 17 | Colorado State Employee |
| | Interviewee 18 | Western Slope Rancher |
| | Interviewee 19 | CPW Commission |
| | Interviewee 20 | Sportsman/Outfitter |

### *Thematic Content Analysis*

To analyze responses to these interview questions, we used a combined deductive and inductive thematic content analysis approach. Thematic content analysis is a method commonly used to analyze qualitative data and includes identifying meaningful topics, ideas, and patterns (Braun and Clarke, 2006; Saldaña, 2016). A deductive approach involves analyzing the data using predetermined themes as identified from existing theory or frameworks while an inductive approach is driven by the data. We used the organizational structure of categories and themes in this analysis where categories represented overarching concepts and themes exist within categories and are specific types of content that are conceptually different from each other but are related to other themes within the same category (Braun and Clarke, 2006). Our deductive approach included using the categories of perceptions and themes of specific perceptions, pulled from Bar-Tal (2000; 2007) and Cehajic-Clancy et al. (2016), in our adapted theoretical model. This included 19 themes of specific perceptions across the four categories of perceptions with four themes in *perceptions of intergroup relations*, five of themes in *perceptions of the outgroup,* eight themes in *perceptions of the ingroup and self*, and two of themes in *perceptions of the nature of the conflict* (see figure 3 in the theoretical framework section).

**Procedure.** The analysis consisted of three phases and all interviews were coded by two coders. In the first phase two coders reviewed a random sample of eight interviews to explore the

applicability of the deductively developed codebook, create context specific definitions, and allow for the inductive identification of new themes of specific perceptions. In this phase we identified one new theme, the outgroup is misinformed, within the category of *perceptions of the outgroup*. The second phase consisted of expert review by a scholar deeply familiar with stakeholder perspectives about proposed wolf reintroduction in Colorado. This included the expert reviewing the codebook complete with context specific definitions and three of the interviews coded in phase one. After expert review, final modifications were made to codebook definitions, however no themes were added or removed. The third phase included final coding of all interview transcripts, including a re-analysis of the interviews reviewed in the first phase. Final phase coding included two steps performed for each interview. Frist, both coders independently coded each interview and, second, the coders came together to review coding and reach agreement. All interviews were analyzed in the NVivo software program.

## Results

### Perceptions Across the Full Sample

Across the 20 interviews, we coded specific perceptions within the four categories of perceptions 275 times (Table 8). Across the 20 participants, *perceptions of the outgroup* was the most frequently coded category of perceptions (mentioned by 19 participants; accounting for 37.1% of coded perceptions). The second most frequently coded category was *perceptions of intergroup relations* (discussed by 19 participants; accounting for 32% of coded perceptions), followed by *perceptions of the ingroup and self* (mentioned by 14 participants; accounting for 25.1% of coded perceptions), and lastly, *perceptions of the nature of the conflict* (described by 10 participants; accounting for 5.8% of coded perceptions).

Table 8**.** A comparison of the frequency of categories and themes across the full sample and the three positionality sub-groups out of the 275 total specific perceptions coded.

| **Category of Perceptions and Specific Perceptions coded for** | **Full Sample (*n*=275)** | **Middle Ground Subgroup (*n*=90)** | **Supportive Subgroup (*n*=107)** | **Opposition Subgroup (*n*=78)** |
|---|---|---|---|---|
| *Perceptions of the Outgroup* | *102 (37%)* | *29 (32%)* | *41 (38%)* | *32 (41%)* |
| Unjust and Unfair | 26 | 6 | 9 | 11 |
| Outgroup Homogeneity | 19 | 6 | 7 | 6 |
| Outgroup Malleability | 20 | 9 | 9 | 2 |
| Misinformed | 15 | 4 | 8 | 3 |
| Delegitimizing the Other | 19 | 4 | 7 | 8 |
| Deviating Norms | 3 | 0 | 1 | 2 |
| *Perceptions of Intergroup Relations (IGR)* | *88 (32%)* | *47 (52%)* | *23 (22%)* | *18 (23%)* |
| Perspective-Taking | 31 | 19 | 8 | 4 |
| Past IGR | 25 | 11 | 7 | 7 |
| Future IGR | 18 | 8 | 6 | 4 |
| Present IGR | 14 | 9 | 2 | 3 |
| *Perceptions of the Ingroup and Self* | *69 (25%)* | *7 (8%)* | *37 (35%)* | *25 (32%)* |
| One's Own Victimization | 18 | 4 | 6 | 8 |
| Positive Self Image | 17 | 0 | 12 | 5 |
| Justness of One's Own Goals | 15 | 0 | 10 | 5 |
| Moral Disengagement | 3 | 2 | 0 | 1 |
| Security | 3 | 1 | 0 | 2 |
| Unity | 5 | 0 | 3 | 2 |
| Patriotism | 3 | 0 | 1 | 2 |
| Ingroup Responsibility | 5 | 0 | 5 | 0 |
| *Perceptions of the Nature of the Conflict* | *16 (6%)* | *7 (8%)* | *6 (6%)* | 3 (4%) |
| Peace | 12 | 6 | 4 | 2 |
| Conflict Malleability | 4 | 1 | 2 | 1 |

Table 9**.** A comparison of the percentages of participants who discussed each category of perceptions and specific perceptions across the full sample and the three positionality sub-groups.

| **Category of Perceptions and Specific Perceptions coded for** | **Full Sample (*n*=20)** | **Middle Ground Subgroup (*n*=10)** | **Supportive Subgroup (*n*=6)** | **Opposition Subgroup (*n=4*)** |
|---|---|---|---|---|
| *Perceptions of the Outgroup* | *95%* | *90%* | *100%* | *100%* |
| Unjust and Unfair | 60% | 50% | 67% | 75% |
| Outgroup Homogeneity | 60% | 50% | 50% | 100% |
| Outgroup Malleability | 55% | 50% | 83% | 25% |

| | | | | |
|---|---|---|---|---|
| Misinformed | 45% | 20% | 67% | 75% |
| Delegitimizing the Other | 40% | 20% | 33% | 100% |
| Deviating Norms | 15% | 0 | 16.7% | 50% |
| *Perceptions of Intergroup Relations (IGR)* | *95%* | *90%* | *100%* | *100%* |
| Perspective-Taking | 75% | 90% | 67% | 50% |
| Past IGR | 75% | 70% | 67% | 100% |
| Future IGR | 60% | 70% | 67% | 50% |
| Present IGR | 40% | 40% | 16.7% | 75% |
| *Perceptions of the Ingroup and Self* | *70%* | *50%* | *83%* | *100%* |
| One's Own Victimization | 50% | 30% | 50% | 100% |
| Positive Self Image | 40% | 0 | 83% | 75% |
| Justness of One's Own Goals | 35% | 0 | 67% | 75% |
| Moral Disengagement | 15% | 20% | 0 | 25% |
| Security | 15% | 10% | 0 | 50% |
| Unity | 15% | 0 | 16.7% | 50% |
| Patriotism | 10% | 0 | 16.7% | 25% |
| Ingroup Responsibility | 5% | 0 | 16.7% | 0 |
| *Perceptions of the Nature of the Conflict* | 50% | *40%* | *83%* | |
| Peace | 40% | 30% | 67% | 25% |
| Conflict Malleability | 20% | 10% | 33% | 25% |

***Perceptions of the Outgroup***

Nineteen of the 20 participants shared a specific perception within this category at least once (table 9). Twelve participants shared beliefs that the outgroup is acting in an unjust and unfair way, for example suggesting the outgroup's goals and actions are selfish and not justified. Additionally, twelve participants shared thoughts regarding outgroup homogeneity, suggesting outgroup members share the same negative traits and goals, specifically those that conflict with their own. Similarly, 11 participants discussed outgroup malleability. There was a mix of perspectives on whether or not outgroup members were capable of changing or willing to change their beliefs, goals, and behaviors related to proposed wolf reintroduction. Perceptions that the outgroup is not malleable is damaging in conflict situations while the perspective that the outgroup can change is one that helps reduce conflict. Specific perceptions that were discussed

by fewer than half of the sample included: (1) beliefs that the outgroup is misinformed and therefore using incorrect information to frame their beliefs and actions, which is our inductively identified specific perception (*n*=9); beliefs that delegitimized outgroup members and their goals and actions such as accusations that they are lying to achieve their goals, that they are uneducated, and selfish (*n*=8); and, (3) beliefs that outgroup members are deviating from acceptable norms related to their conduct such as using a ballot initiatives to make decisions about wildlife (i.e., ballot box biology) (*n*=3).

***Perceptions of Intergroup Relations***

Nineteen of the 20 participants shared a specific perception within this category at least once (table 9). Perspective-taking, which is an activity critical to for repairing intergroup relations, was most common (*n*=15) and included: (1) engagement in perspective-taking where participants contemplated the outgroup's perspectives, the motivations behind their actions, or the rationale behind their positionality; and (2) objective discussion about the benefits of perspective-taking as a tool to help repair intergroup relations. Additionally, fifteen participants discussed how the groups in conflict interacted prior to the ballot initiative to reintroduce wolves (i.e., past intergroup relations) and twelve participants deliberated on what future intergroup relationships between might look like. Discussions of future intergroup relations covered (1) beliefs about potential impacts to relationships as a result of the ballot initiative to reintroduce wolves and (2) contemplation of what might help repair future intergroup relations. The latter of which has the potential to help reduce conflict. Eight participants described intergroup relations at the time of the interviews (i.e., present intergroup relations) by either describing their own personal experiences interacting with outgroup members, with a mix of good and bad

interactions, or by sharing their beliefs about the quality of relationships amongst those groups in conflict.

***Perceptions of the Ingroup and Self***

Fourteen of the 20 participants shared a specific perception within this category at least once (table 9). One's own victimization was the most common specific perception discussed ($n$=10), where participants described themselves as victims of the outgroup's goals and actions, such as not being allowed to participate in decision-making about wildlife, which some described as a reason for pursuing a ballot initiative, or having to deal with negative impacts of wolves including depredations on livestock. Eight participants described a positive self-image, such as being the most educated on the issue or being morally superior to outgroup members. Seven participants discussed the justness of their and their group's goals, such as doing what is best for Colorado's ecosystems or protecting the safety of people and livestock. This belief of justness was used to rationalize their actions in relation to the conflict despite any potential consequences to others. Perceptions related to security, unity, and moral disengagement were described by three participants each. Those who discussed security focused on protecting livelihoods, humans, and pets. When describing unity, participants discussed moving past any intragroup differences, or potential conflicts among like-minded organizations, and coming together to achieve their broader goals related to proposed reintroduction. Moral disengagement included discussions where participants disengaged from the conflict and associated responsibility, typically lacking self-criticism while placing full blame on outgroup members. Two participants described perceptions related to patriotism, which in this context related to the belief that they are doing what is best for Colorado. Finally, only one individual described any responsibility in

contributing to, and needing to help resolve, the conflict (i.e., ingroup responsibility) which is an important reconciliatory perception.

***Perceptions of the Nature of the Conflict***

Ten out of the 20 participants shared a perception within this category at least once (table 9). Eight participants discussed their perceptions of peace by describing what would help resolve the conflict. Some, for example, suggested the conflict would only end for them if wolves were not reintroduced while several others shared peace could only be achieved through compromise and collaboration amongst groups with opposing views. Lastly, four participants shared thoughts on conflict malleability, discussing whether and how the conflict can change or end. Those who believed the conflict is malleable suggested it can only end through compromise and collaboration (i.e., the only way peace can be achieved).

**Comparison Across Subgroups**

The middle-ground subgroup is the largest subgroup with ten participants, yet this subgroup had the fewest specific perceptions coded ($n$= 90) with an average of 10 specific perspectives coded per person. Those in support of reintroduction included six participants who had an average of 17 specific perceptions coded per person ($n$= 107). Lastly, there were four participants in the subgroup of those who oppose reintroduction with an average of 19 specific perceptions coded per person ($n$= 78). Thus, those participants with a clear positionality toward proposed wolf reintroduction, either in support of or opposition to, described specific perceptions that fuel conflict at a higher rate than those who expressed middle-ground perspectives and/or viewed themselves as 3$^{rd}$-parties to the conflict. Further, the most common categories of perceptions by subgroup deviated from the full sample.

***Perceptions of the Middle-Ground Subgroup***

For the middle-ground subgroup*, perceptions of intergroup relations* included 52.2% of all their specific perceptions coded. This is followed by *perceptions of the outgroup* at 32.2% of all specific perspectives coded (table 8). By far, the middle-ground participants engaged in the most perspective-taking and discussion of past and future intergroup relations. When describing specific perceptions within *perceptions of the outgroup* participants in this subgroup discussed other stakeholders by pontificating on why they were engaged in the conflict, and what their perceptions of each other might be. For examples of this groups' perspective-taking, which is a critical activity for pursing reconciliation, interviewee 3, a federal wildlife biologist, described what they perceived to be the primary drivers of conflict from the point of view of two main groups:

> …the rural community is very utilitarian and the other is not and I think there is a lot of belief from the environmental and animal rights community that wolves have an inherent right to be on the landscape and I don't think rural communities necessarily share that perspective… and then there's this notion of government intrusion and so I feel like… agricultural communities especially feel like they're getting something forced down their throats.

Interviewee 6 from an environmental NGO, further pontificated on why agricultural producers may be engaged in the conflict:

> The concern is the uncertainty, that's the problem. That's what no one ever gets is that people can always figure out a way to deal with impacts, but what people can't deal with is constant fear and uncertainty. That is where, so many producers live… not knowing one year to the next, what's going to be happening. It's a world where it continually becomes more difficult to do their jobs and the world around them has changed and they haven't.

Moreover, interviewee 8, a sportsperson, took the perspective of environmentalist and animal welfare groups in Colorado to explain why they may have pursued a ballot initiative approach:

> There's been a 30 year or so effort… about how we could or should do this [reintroduce wolves] and one of the contentions of the groups that are pushing this [the ballot

> initiative] is, you know, "we've been trying to do this for a long time, more people and more intrusion into wild places that are left in Colorado. It's now or never and we don't really want a ballot initiative either but it's really the only thing we have left to do."

***Perceptions of those in Support and those in Opposition***

Participants in the support and opposition subgroups described specific perceptions within the four categories of perceptions at similar rates with similar patterns in specific perceptions shared, illustrating that the conflict narratives of these groups mirror each other's (tables 8 and 9). For both subgroups, *perceptions of the outgroup* was the most commonly discussed category with 38.3% of the support subgroup's and 41.0% of the opposition subgroup's specific perceptions coded in this category. When describing outgroup members both subgroups shared similar perceptions of each other. For example, the outgroup acting in unjust and unfair ways was the most common specific perception described by both subgroups. Interviewee 20, an outfitter from the opposition subgroup, shared the belief that reintroduction would be unfair to landowners and consumptive stakeholders:

> I believe that it is their goal to diminish and decrease any sort of consumptive use in whatever form or fashion that they possibly can. If you put wolves on the landscape you create a problem, if you put anything on the landscape that has over reaching government regulations it prohibits or restricts land owners or land leasers or the oil and gas industry, the recreation industry, the off road vehicle industry, the hunting industry, because you have an endangered and threatened species on the landscape.

Interviewee 11, from an environmental NGO that supports reintroduction, used a personal experience they had with an outgroup member to illustrate how those who oppose reintroduction have acted unfair:

> I spoke very politely about the importance of wolves to Colorado [at a CPW commission meeting]…I had [name redacted for anonymity] talk to me in the hall afterwards and just so unprofessional and inappropriate almost raising his voice at me and getting angry about my organization and our opinions on the importance of wolves and I can guarantee you I was nothing but polite in my conversation to the commission.

For the support subgroup, beliefs that the outgroup is unfair and unjust is followed in frequency by discussions of outgroup malleability, the outgroup being misinformed, and outgroup homogeneity. For the opposition subgroup, this was followed by beliefs that delegitimize outgroup members and discussion of outgroup homogeneity. Of those in the support subgroup that shared beliefs regarding outgroup malleability, interviewee 16 a federal wildlife biologist, did not believe outgroup members would change, which is a perspective that perpetuates conflict:

> You grow up thinking with a particular world view and that world view will include wolves in it or it won't and it's that black and white, those world views don't change much.

Conversely, interviewee 11 from an environmental NGO also in the support subgroup, shared their personal experience seeing members of the outgroup change perspectives, which aids reconciliation:

> We've put on workshops in western Colorado where we bring ranchers from areas where wolves do exist and where they are living with wolves successfully… to talk to ranchers down here in Colorado. It's been met with incredible success… people who were extreme opponents to just the topic of wolves and in over the course of a day really changing, not liking it [wolf reintroduction] but very interested in learning more about "how can we reduce losses from all predators including the ones that are already here."

In a final example of outgroup perceptions, when describing outgroup members as homogenous interviewee 17, a Colorado state employee in the opposition subgroup, shared the belief that those who support reintroduction are all individuals that would not interact with or be impacted by wolves, are all urbanites, and do not have livelihoods or engage in activities that this interviewee relates to:

> …they're not going to be impacted one way or the other. They don't hunt, they're not going to have to pay for it, they don't raise livestock or anything, and they might not even leave their own city.

*Perceptions of the ingroup* is the second most frequent category with 34.6% of the support subgroup's and 32.1% of the opposition subgroup's specific perceptions coded in this category. Again, members from both subgroups discussed specific perceptions within this category at similar rates in similar ways, sharing the same conflict narrative. For the support subgroup the most frequently discussed specific perceptions included positive self-image, justness of their goals, and the belief of being victims of outgroup members. For the opposition subgroup, participants most frequently discussed their victimization by outgroup members followed by positive self-image and justness of their goals.

In an example of justifying one's goals, interviewee 14, a tribal government representative from the support subgroup, defended bringing wolves back to Colorado based on culture:

> We as tribal governments and tribal people, we miss those animals… we have stories about them, we have stories that go way back that they were a part of our lives, they have the role that they play in our tradition our culture.

Similarly, interviewee 17, a Colorado state employee, justified their opposition by discussing the negative experiences those in other states have had, "we've seen it happen in a couple other states and there's nothing but horror stories coming out of those states", and how those with knowledge about and experience with CNRM are opposed:

> Every agency person and natural resource person I know in the years since wolves were first officially sighted in Colorado think that it's a bad idea to force any kind of reintroduction.

For those who viewed themselves and their group as the victims in the conflict, interviewee 18, a western slope rancher that opposes reintroduction, described the agricultural community as a minority group that will have the unfair burden of living with and being impacted by wolves:

> We need to get on the same page if we're ever gonna have anything concrete done because those of us in agriculture are a minority and we need other people to understand what our goals and our perspectives and needs and our contributions are.

Within *perceptions of the self and ingroup* only one participant in the support subgroup, interviewee 15 from an environmental NGO that works closely with producers, expressed the belief of their ingroup's responsibility in contributing and needing to help resolve the conflict. This is an important perception for repairing intergroup relations.

> The main concerns is with the messaging behind it [the proposed ballot initiative], as far as how it's messaged to the public. I believe that has created more social friction in the way its handled than it has helped.

> As wolves have entered each state there was a lot of initial celebration, they've been protected, populations grow, they get into quote-unquote trouble, they do what wolves do, and then starts the conflict and we see this repeated pattern over and over again and yet I don't believe we've come any closer to changing that [cycle]. I personally think part of that is because [we've] been looking at it as just wolf conservation versus taking a more comprehensive approach where you're looking at wolves, people, livestock… on an equal playing field. I mean obviously I'm a wolf lover, there's no denying that, but I've learned that it does wolves no favors when you don't consider the social dynamics.

Finally, both subgroups often paired perceptions about the outgroup and ingroup in similar ways. For example, both subgroups viewed themselves as the most informed because their perspectives were based upon scientific data and facts (positive self-image) while at the same time, describing outgroup members as being misinformed and, in some cases, as intentionally lying and spreading misinformation to sway the public. Similarly, members of both subgroups viewed themselves as being victims of outgroup members, whose goals were unjust and unfair, while viewing themselves as doing the right thing for Colorado and having just goals. For an example of pairing outgroup and ingroup perceptions, interviewee 13 from an environmental NGO shared the positive self-image of being the most informed and the perspective that the outgroup is misinformed "they bring up antidotal information from the

northern Rockies and I present facts, I present the evidence". Similarly, interviewee 20, an outfitter in the opposition subgroup, shared:

> …people that… are open minded enough, you can throw a little bit of an education and information component into it and give them some legitimate facts and statistics, but at the same time you know when you have your mind made up so handily [like] with supporters, it's hard to get those people to even budge in any way, shape, or form.

## Discussion

Our findings illuminate the most salient sociopsychological drivers of intergroup conflict about wolf reintroduction in Colorado, which can be targeted through interventions in a reconciliation process. Reducing intergroup conflict about wolves is critical for achieving coexistence and for protecting wolves and human livelihoods (Marino et al., 2021; Venumière Lefebvre et al., 2022; Zimmerman et al., 2020). Additionally, other benefits include saving time and costs associated with management initiatives and reducing associated lawsuits and legislation (Madden & McQuinn, 2014; Marino et al., 2021). When describing the conflict, participants shared specific perceptions within all four of our modified theoretical categories. Those who presented a middle-ground perspective or viewed themselves as 3rd-parties to the conflict most frequently discussed perceptions within the category of intergroup relations. Those stakeholders who strongly supported reintroduction and those who strongly opposed reintroduction most commonly described perceptions of the outgroup and the ingroup.

Given that our adapted model helps identify the specific perceptions about intergroup relations that fuel conflict, we posit it could contribute to other environmental conflict frameworks, such as exploring the *relationship* dimension of Madden & McQuinn's (2014) Conservation Conflict Transformation framework. These authors propose three dimensions to consider when planning conflict reduction interventions: 1) process - how are decisions made? who is included?; substance - what is the topic being disputed?; and relationships - what is the

quality of relationships? what is the level of trust and respect?. Adding to these existing frameworks may be beneficial because research suggests that reconciliation interventions should be implemented to repair relationships before involving stakeholders in negotiation, deliberation, and decision-making (Zimmerman et al., 2020). Yet, in the past, research and stakeholder processes about conflict over wolves has focused on negotiating over the substance of the conflict, such as management approaches, design of compensation programs, and whether hunting wolves should be allowed, thereby excluding the relationship and process components (Madden & McQuinn, 2014; Zimmerman et al., 2020). More recently, researchers have implemented collaborative and deliberative stakeholder processes that do include exploring the diverse values surrounding wolf restoration and that involve stakeholders in decision-making (Lundmark & Matti, 2015; Lute & Gore, 2014; Marino et al., 2021; Vucetich et al., 2021). For example, Marino et al., (2021) ran several participatory stakeholder workshops in Italy to address substance disputes over wolves in Italy and found these workshops resulted in consensus over management issues such as the potential benefit of proactive conflict reduction approaches (e.g., fladry, livestock guardian dogs, etc.) and a suitable compensation program. Though these processes are all important frameworks and endeavors, these process designs do not explicitly analyze and target the socio-psychological drivers of conflict, which is necessary to achieve reconciliation (Bar-Tal, 2000, 2007; Hameiri et al., 2014).

Half of our sample identified as a 3rd-party to the conflict or presented a middle-ground perspective despite the fact that they aligned with various stakeholder groups such as sportspersons, environmental NGOs, and academics. These participants primarily shared perceptions in the category of intergroup relations. They showed a high capacity for perspective-taking, thoughtfully sharing their understanding of the conflict from the perspective of those

groups they believed were involved and considering the history of intergroup relations that lead to conflict or the potential impact of this conflict on future intergroup relations. The propensity of this subgroup for perspective-taking, which is the act of exploring a situation or concept from another's point of view, has important implications. Perspective-taking is a foundational intervention utilized in reconciliation processes because it fosters empathy and reduces animosity toward outgroup members, which is a vital first step in repairing intergroup relations (Cehajic-Clancy et al., 2016; Galinsky, 2015; Hameiri et al, 2014). For example, Brown and Cehajic (2008) found, in the aftermath of the 1992-1995 violent conflict in Bosnia and Herzegovina, that Serbian adolescents who engaged in perspective-taking were more likely to support that their ingroup offer reparations, such as providing apologies and compensation, to Bosnian Muslim victims. To our knowledge, there is no research identifying how these "middle-ground" stakeholders, who are part of the conflict situation but do not hold the extreme conflict narrative, contribute to intergroup reconciliation. Yet, these individuals could serve as important resources to conflict mediators by advocating for and modeling perspective-taking and empathy-building. Future research should explore how to identify these middle-ground stakeholders, how they can diffuse reconciliatory behaviors through their ingroup, and their potential for peer-to-peer mediation.

Of the remaining half of our sample, six participants were demonstrably in support of reintroduction and four were in opposition. The primary specific perceptions shared by these two subgroups strongly mirrored each other and fell into perceptions of the outgroup and perceptions of the ingroup and self. These participants most commonly described the outgroup as unjust and unfair, misinformed, homogenous, and unmalleable. Conversely, when describing themselves and their ingroup, participants shared a positive self-image and viewed themselves as victims of

the outgroup's goals and actions while viewing their own goals and actions as just. Our findings illustrate that both groups have constructed conflict narratives that are damaging to intergroup relations and that fuel conflict-supporting emotions. For example, the perspective that all outgroup members are inherently unchangeable and are all the same, especially compared to outgroup members who may have committed egregious, paired with feeling like a victim of unjust outgroup actions, leads to feelings of hatred and anger toward outgroup members (Cehajic-Clancy et al., 2016). Such negative emotions are barriers to reconciliation and encourage conflict-contributing actions and reactions.

The conflict narrative, and the outgroup and ingroup framing, described by our participants is typical for social identity conflicts like wolf restoration and management (Bohm et al., 2020; Lute & Gore, 2014). Social identity theory posits conflict occurs because actors perceive their values, beliefs, actions, and identity as threatened and devalued by those of a different identity group (Bohm et al., 2020; Hurst et al. 2019). Conflict research further suggests this outgroup and ingroup framing is, in part, a result of compounding cognitive biases (Porat et al., 2015). First, people are inherently egocentric and see themselves in a positive light and their actions as having a positive intent even in the event of negative outcomes (Bar-Tal 2000, 2007; Galinsky, 2015). For example, many of our participants in support of reintroduction believe they are doing what is morally right to atone for past injustices to wolves and what best for the environment, even with the possibility of negative consequences to other stakeholders, such as ranchers. Further, naïve realism is a cognitive bias where individuals perceive themselves and their ingroups' views to be objective and unbiased while simultaneously perceiving the outgroup's views as biased, self-interested, and irrational (Hameiri et al, 2014). For example, some of our participants that opposed reintroduction believed their goals are rational because they are protecting people and

livelihoods, but believed reintroduction is irrational and self-serving because there is a potential for wolves and humans to be harmed. Finally, relevant to social identity conflicts in particular, positive distinctiveness is a bias wherein a positive self-image is created via a favorable comparison relative to outgroup members (Bohm et al., 2020). This bias was demonstrated by both subgroups describing themselves and their group as most informed and as knowing the "right" facts about wolves compared to outgroup members who were described as ignorant or as purposely spreading misinformation.

The category of perceptions of the nature of the conflict was the most minimally coded of the four categories. This is likely because we did not include any analysis of the substance of the dispute in this paper. See Gonzalez et al. (*In prep*) for results of this analysis. Regardless, the remaining specific perceptions of peace and conflict malleability were minimally discussed which is an important finding because believing that the conflict can improve and that peace between conflicting groups can be achieved is critical for reconciliation (Bar-Tal, 2000, 2007; Cehajic-Clancy et al., 2016). Another key perception missing from participant discussions was the belief of ingroup responsibility in contributing to and ending the conflict. All but one participant seemingly placed full blame of the conflict situation on the outgroup. It is common for individuals to cognitively defend themselves against the uncomfortable emotion of guilt by avoiding self-criticism and rejecting responsibility of any actions that may have caused harm (Cehajic-Clancy et al., 2016). Yet, guilt is a critical motivator for reducing conflict, repairing intergroup relations, and for offering reparations for any damages done to outgroup members. These findings suggest that to pursue reconciliation over proposed wolf reintroduction in Colorado processes should encourage participants to explore what peace between groups would look like and to be reflective of and consider how their actions have contributed to the conflict.

The conflict and peace-building literature describes innumerous reconciliation interventions designed to target specific perceptions that drive conflict as well as the biases that influence individual's perceptions (Bohm et al., 2020; Galinsky, 2015). Based on our findings, we highlight a few interventions that may reduce conflict in the context of proposed wolf reintroduction in Colorado. First, emotion regulation is a reconciliation process where individuals learn to control which emotions they have and how they experience and express them in order to reduce the negative emotions that fuel conflict and enhance the positive emotions that foster reconciliation (Cehajic-Clancy et al., 2016). This process itself can be an intervention when facilitators train participants to objectively reappraise their emotions and change their reactions to the emotion-inducing stimuli. Additionally, facilitators can indirectly encourage emotion regulation through complementary interventions that target and change the perceptions that fuel emotions. For example, to reduce feelings of hatred and anger caused by perceptions of outgroup homogeneity, one might use individuation, paired with intergroup contact which would bring together individuals of opposing groups and illustrate how outgroup members are unique individuals with their own desires, needs, interests, and objectives (Bohm et al., 2020; Galinsky, 2015).

Joint-fact finding is a collaborative intervention that is best employed within broader stakeholder engagement processes. This approach may be particularly beneficial in Colorado given our participants' disagreement about facts related to wolf management and about the language used in the ballot initiative which suggests that wolf restoration should be guided by the best available science. Joint-fact finding is an activity-based intervention wherein stakeholders work collaboratively to identify information and sources they trust which should be used when drawing conclusions or making decisions (Daniels & Walker 2001; McCreary et al.,

2001). Hansen et al. (2022) detailed a collaborative joint fact-finding process, the Wolf Dialogue Project (WDP), which was employed in Denmark to bring citizens together to develop recommendations for a wolf management plan and to reduce the conflict surrounding the immigration of wolves from Germany. By offering a common goal that the WDP members could work toward (i.e., identifying trusted sources and information) trust and relationships were built.

Research suggests that asking participants to work together toward a superordinate goal, or a common goal that necessitates cooperation and combining of resources, is a highly effective reconciliatory intervention (Cehajic-Clancy et al., 2016; Galinsky, 2015). Working towards a common goal provides the opportunity for creation of a superordinate group that is comprised of conflicting individuals who have formed a new group identity. Lute and Gore (2014) identified identity drivers about wolves in Michigan USA through focus groups and found that opposing individuals held many of the same stewardship goals and values. Thus, these authors suggested that establishing a common group identity around stewardship values, rather than focusing on perspectives about wolves, may help reduce conflict. In Colorado many groups are coming together to work on identifying and implementing non-lethal tools, such as fladry, livestock guardian dogs, scare devices, carcass removal, and range riders, to proactively minimize wolf predation on livestock and ensure fewer livestock and wolves are killed. This may be an ideal superordinate goal for conflicting groups because it supports both groups' goals without asking them to compromise their values. Future work in Colorado should prioritize interventions geared toward reducing identity-based conflicts. Additionally, research might explore the process by which individuals self-categorize into superordinate groups and how social outcomes of such collaborative groups, such as reduced conflict and increased trust, disseminate beyond these groups.

## Conclusion

Our findings suggest that our adapted theoretical model may help researchers and practitioners in identifying and analyzing the perceptions that drive environmental conflicts. In the context of proposed wolf reintroduction in Colorado, the application of our model helped create a baseline characterization of the intergroup conflict about wolf restoration and management, thereby suggesting potential interventions to reduce the conflict. Now that Proposition 114 has passed and CPW has released their restoration and management plan, our team continues to engage in research on intergroup conflict, via surveys, interviews, and outreach and will re-test this model and identify if new perceptions have emerged. Given our small sample size - only ten participants strongly identified as either in support or opposition to reintroduction - our findings are not fully generalizable to other stakeholders who are in conflict about wolf restoration and management. Nonetheless, our findings are strongly reflected in the conflict and peace-building literature on intergroup perceptions. Future research on the intergroup conflict about wolves could employ this model to identify if our findings hold true across a new sample. Additionally, only one of our participants identified as a rancher. Given this is one of the primary stakeholder groups involved in the conflict, and a group who may experience negative consequences associated with reintroduction, continued engagement with this group in our ongoing and future work.

# CONCLUSION

Research suggests human behavior is embedded within a dynamic multi-scalar system (Lischka et al., 2018; Manfredo et al., 2014). Within this system, the external levels, which include groups, institutions, and society, drive behavior as do individuals' cognitive processes (i.e., values, attitudes, emotions) and other attributes (socio-demographics; Lischka et al., 2018; Manfredo et al., 2014). In this dissertation, I conducted research on how perceptions about the group level of the social system influences individuals' perceptions of and behaviors related to gray wolf reintroduction in Colorado. Each chapter explored different aspects of the group level as possible influencers of perceptions and behaviors related to wolf reintroduction: intragroup perceptions, inter- and outgroup perceptions, and perceptions of what would make a collaborative intergroup contact process successful. Overall, my dissertation is meant to expand our collective understanding of the multi-scalar influencers to human behavior that affect carnivore restoration and management.

In my first chapter I explored the influence of perceived social norms, which is an intragroup perspective, on planned individual and collective civic actions related to proposed wolf reintroduction in Colorado. Specifically, I examined the relative influence of perceived descriptive (i.e., what important others are doing) and injunctive norms (i.e., what others think you should do), compared to individual-level attitudes, beliefs, and other characteristics (e.g., sociodemographics), on planned voting behavior and collective civic actions. I found that both perceived descriptive and injunctive norms influenced individuals' planned voting behavior. Additionally, perceived descriptive norms predicted plans to engage in collective actions against wolf reintroduction, however social norms did not predict planned collective action in support of

reintroduction. Our findings regarding the influence of norms on voting behaviors suggests that those seeking to promote voting in favor of conservation initiatives, such as environmental NGOs, may want to highlight the large number of others who are supportive of those initiatives, and are planning to vote in favor of it, within outreach and messaging campaigns. Further, our findings that perceived descriptive norms were predictive of planned collective actions in opposition, but not in support, suggest that descriptive norms may be influential, but more research is needed. Additionally, future research might explore more in-depth social influence interventions, such as encouraging motivated individuals to diffuse normative information throughout their social networks, to better understand how to foster collective actions (Abrahamse & Steg, 2013).

In my second chapter I explored the expectations stakeholders had for a SE process that brought diverse individuals together to develop recommendations for Colorado's wolf restoration and management plan. My key contribution includes elevating the expectations of highly engaged stakeholders who care deeply about this issue, but who were not formally part of the process as a stakeholder advisory group member. Few studies explore such individuals' goals and objectives for SE, yet these stakeholders have the ability to influence the outcome of SE and conservation issues in a variety of ways (Niemic et al., 2020; Niemic et al., 2022). Second, we explored the degree to which our participants discussed the various criteria and outcomes from Young et al.'s (2013) existing research-based SE evaluation framework to better understand the context dependency of our participant's expectations compared to findings from prior research. We found substantial overlap in the PC and SO our participants described, suggesting external validity in our findings as well as highlighting context specific expectations. Our participants described two novel PC of intentional two-way communication and active inclusivity.

Additionally, they added two SO of increased trust in agency and acceptance of management decisions to Young et al.'s (2013) framework. Our findings provide valuable insight to practitioners and agency personnel for designing SE processes to achieve SO, particularly for contentious issues that are steeped in stakeholder vitriol. For example, stakeholders expected the processes to be representative and inclusive of diverse stakeholders, including those external to a small advisory group, by integrating mechanisms for two-way communication within and outside of the process. Additionally, they expected the process to allow stakeholders to influence decisions through opportunities that allow for meaningful input and ensure stakeholders' needs, concerns, values, and recommendations are incorporated into final decision-making efforts. Future work could experimentally test various criteria within a SE process to identify which social outcomes are achieved.

In my third chapter I explored perceptions related to stakeholder conflict about CNRM. Using social-psychological theories from the conflict and peace-building literature, I adapted a theoretical model of intergroup conflict to explore human-wildlife conflicts. The model includes four primary categories of perceptions including those related to one's own group, groups one is in conflict with, the relationship between groups, and the nature of the conflict. We found that all interviewees discussed perceptions that can fuel conflict between groups. However, interviewees who identified as 3rd parties to the conflict primarily discussed the relationships between those in conflict excluding themselves and engaged in thoughtful perspective-taking, an activity that can help reduce conflict. Conversely, both those in support of reintroduction and opposed to reintroduction described negative perceptions about the other group and positive perceptions about their own group. For example, when discussing stakeholders outside of their group, those in support or opposition often described each other as acting in unjust and unfair ways, as being

incapable of or unwilling to change, and as misinformed. When describing positive perceptions of themselves, both those in support and those in opposition viewed their own goals as just and themselves as victims of outgroup members' actions. Based on findings, I suggested various reconciliation interventions that may be useful in reducing the conflict about wolf reintroduction in Colorado. Future work could experimentally test reconciliation interventions, such as intergroup contact theory, development of superordinate goals, and emotion regulation, to identify their effectiveness in reducing conflict about wildlife management and wolves.

I used a transdisciplinary approach (TD) to conduct my doctoral research. TD crosses the academic silo by incorporating researchers, methods, and inquiry from several disciplines as well as non-academic partners, whether practitioners or members of the relevant community, into research that can inform environmental policy and practice (Kim et al., 2022). As we face increasingly complex and urgent environmental challenges, this fundamental shift in problem-solving is needed (Bernstein, 2015). To address crises, such as rapid biodiversity loss, climate change, and conflicts over diminishing resources (e.g., access to water), the research-implementation gap must close (Kim et al., 2022). Providing equal attention to scientific findings, practitioner needs, and community values when problem-solving, can help reduce this gap and achieve solutions that are readily implementable and accepted (or supported) by affected communities (Kim et al., 2022). As a core component of my TD approach, my doctoral committee members included both social and ecological scientists and two practitioners. One practitioner is a consultant to government agencies, industry sectors, environmental NGOs, and private landowners to help them achieve desired conservation outcomes through strategic collaboration, facilitation, and innovative processes. The second practitioner is an employee from CPW, the agency tasked with developing the plan to reintroduce wolves and ultimately, carrying

out the reintroduction of wolves in the state. Additionally, I engaged and collaborated with the stakeholders central to the debate about wolf reintroduction to understand and help address their needs.

I have two primary reflections, which highlight the benefits and challenges of a TD approach. First, I highlight the benefits of this approach, which elevated my work and helped me grow as a scientist. Having such a diverse committee helped ensure my work was both socially and ecologically relevant. Working with my practitioner members assisted me in understanding how to design research, and make suggestions, that can feasibly be adopted to affect policy and practice. Further, through my stakeholder research and engagement, I learned the needs and concerns of those affected parties that must be incorporated into decision-making. Second, I would suggest researchers consider and prepare themselves for the complexities of pursuing a TD approach. TD research takes patience, commitment, a willingness to learn from others, and a true collaborative mindset. Identifying potential partners necessitates systematic analysis and representation of those affected by or interested in a given issue. Building TD teams takes time, sometimes years, and a genuine commitment to trust and relationship building. Once teams are built, a mutual respect for each individual's approach and skillset must be ensured by acknowledging that all members of the team are equal. Finally, follow through on the commitment to find real-world tangible solutions must be prioritized, particularly when affected community members are incorporated into teams. Despite such challenges, the potential benefit of identifying actionable solutions though transdisciplinarity make the approach worthwhile. Given my commitment to TD work over the years, I believe my doctoral research will inform wolf restoration and management in Colorado.

# REFERENCES


Abrahamse, W. & L. Steg (2013). Social influence approaches to encourage resource conservation: A meta-analysis. *Global Environmental Change, 23*(6), 1773-85. DOI: 10.1016/j.gloenvcha.2013.07.029

Adler R.P. and J. Goggin. (2005). What do we mean by "civic engagement". Journal of Transformative Education, 3(3): 236-253. DOI: 10.1177/1541344605276792

Ajzen, I. and M. Fishbein. (1980). Understanding attitudes and predicting social behavior, Englewood Cliffs, New Jersey: Prentice-Hall.

Amel, E. C., Manning, Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: fostering collective effort toward ecosystem conservation. *Science, 356*(6335), 275-279. DOI: 10.1126/science.aal1931

American Community Survey (ACS) 5-year (2013–2017). 2017. Citizen voting age population special tabulation (ACS 2017-5 year estimate) [data file]. Available at https://www.socialexplorer.com/a9676d974c/explore.

Association of Fish and Wildlife Agencies and The Wildlife Management Institute. (2019). Fish and wildlife relevancy roadmap: Enhanced conservation through broader engagement (v1.0). M. Dunfee, A. Forstchen, E. Haubold, M. Humpert, J. Newmark, J. Sumners, and C. Smith. 2019 (eds). AFWA. Wash. D.C. 128 Pages.

Bamberg, S. & Moser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behavior. *Journal of Environmental Psychology, 27*(1), 14-25. DOI: 10.1016/j.jenvp.2006.12.002

Bar-Tal, D. (2000). From intractable conflict through conflict resolution to reconciliation: Psychological analysis. *Political Psychology, 21*(2), 351-365. DOI: 10.1111/0162-895X.00192

Bar-Tal, D. (2007). Sociopsychological foundations of intractable conflicts. *American Behavioral Scientists, 50*(11), 1430-1453. DOI: 10.1177/0002764207302462

Beall, J. M., W. R. Casola, M. N. Peterson, L. R. Larson, W. A. Carr, E. Seekamp, K. T. and S. B. Jackson. (2021). Cultural cognition and ideological framing influence communication about zoonotic disease in the era of COVID-19. Frontiers Science and Environmental Communication. doi.org/10.3389/fcomm.2021.645692

Beirle, T. C. (2002). The quality of stakeholder-based decisions. *Risk Analysis: An International Journal*, *22*(4), 739-749.

Bennett, N. J. (2016). Using perceptions as evidence to improve conservation and environmental management. *Conservation Biology, (30)*3, 582-592. DOI: 10.1111/cobi.12681

Berl, R. E. W., Sekar, S., Markevich, A., Camara, C., & Niemiec, R. M. (fourthcoming). Assessing the impacts of normative and efficacy-based messaging on the social diffusion of conservation science. Conservation Science and Practice.

Bernstein, J. H. (2015). Transdisciplinarity: A review of its origins, development, and current issues. *Journal of Research Practice, 11*(1).

Beschta, R. L. & Ripple, R. J. (2009). Large predators and trophic cascades in terrestrial ecosystems of the western United States. *Biological Conservation, 142*, 2401–14. DOI: 10.1016/j.biocon.2009.06.015

Blais, A., Galais, C., & Coulombe, M. (2019). The effect of social pressure from family and friends on turnout. *Journal of Social and Personal Relationships, 36*(9). DOI: 10.1177/0265407518802463

Bobbio, L. (2019). Designing effective public participation. *Policy and Society, 38*(1), 41-57. DOI: 10.1080/14494035.2018.1511193

Bohm, R., Rusch, H., & Baron, J. (2018). The psychology of intergroup conflict: A review of theories and measures. *Journal of Economic Behavior and Organization,* 1-50.

Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D. I., Marlow, C., Setttle, J. E., & Fowler, J. H. (2012). A 61-million-person experiment in social influence and political mobilization. *Nature, 489,* 295-298

Brandtzaeg, P. B. (2015). Facebook is no "Great equalizer": A big data approach to gender differences in civic engagement across countries. *Social Science Computer Review, 35*(1), 103-125. DOI: 0.1177/0894439315605806

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology 3*(2), 77–101. DOI 10.1191/1478088706qp063oa.

Bright, A. D. & Manfredo, M. J. (1996). A conceptual model of attitudes toward natural resource issues: a case study of wolf reintroduction. *Human Dimensions of Wildlife*, *1*(1), 1-21.

Brown, R., & Cehajic, S. (2008). Dealing with the past and facing the future: Mediators of the effects of collective guilt and shame in Bosnia and Herzegovina. *European Journal of Social Psychology, 38*(4), 669–684.

Bruskotter, J. T. (2013). The predator pendulum revisited: social conflict over wolves and their management in the Western United States. *Wildlife Society Bulletin, 37*(3), 674–679.

Bruskotter, J.T., Vaske, J. J, & Schmidt, R. H. (2009). Social and cognitive correlates of Utah residents' acceptance of the lethal control of wolves. *Human Dimensions of Wildlife, 14*(2), 119–132. DOI 10.1080/10871200802712571.

Bruskotter, J. T., Vucetich, J. H., Manfredo, M. J., Karns, G. R., Wolf, C., Ard, K., Carter, N. H., Lopez-Bao, J. V., Chapron, G., Gehrt, S. D. & Ripple, W. J. (2017). Modernization, Risk, and Conservation of the world's largest carnivores. *BioScience, 67*(7), 646-655.

Burnham, K. P., Anderson, D. R., & Huyvaert, K. P. (2010). AIC model selection and multimodel inference in behavioral ecology: Some background, observations, and comparisons. *Behavioral Ecology and Sociobiology, 65*, 23-35.

Camara, C., Gonzalez, M. & Niemiec, R. (In Prep). Content analysis of media reporting of wolf reintroduction in Colorado.

Čehajić-Clancy S, Goldenberg, A., Gross, J. J. & Halperin, E. (2016). Social-psychological interventions for intergroup reconciliation: An emotion regulation perspective. *Psychological Inquiry 27*(2), 73–88. DOI 10.1080/1047840X.2016.1153945.

Champine, V., M. Jones, S. Lischka, J. Vaske and R. Niemiec. (2022). Understanding individual and diffusion behaviors related to native plant gardening. *Journal of Environmental Psychology, 81*.

Chase, L. C., Decker, D. J., & Lauber, B. Public participation in wildlife management: What do stakeholders want?, *Society and Natural Resources, 17*(7), 629-639. DOI: 10.1080/08941920490466611

Cialdini, R. B. (2003). Crafting Normative Messages to Protect the Environment. *Current Directions in Psychological Science, 12*(4), 105–109.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1991). A Focused Theory of Normative Conduct: A Theoretical Refinement and Reevaluation of the Role of Norms in Human Behavior. In *Advances in Experimental Social Psychology*, *24*, 201–234.

Cialdini, R. B. & Trost, M. R. (1998). *Social influence: Social norms, conformity and compliance.* In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (p. 151–192). McGraw-Hill.

Clayton, S., Devine-Wright, P., Stern, P. C., Whitmarsh, L.,Carrico, A., Steg, L., Swim J., & Bonnes, M. (2015). Psychological research and global climate action. *Nature and Climate Change, 5*, 640-646.

Coleman, S. (2004). The effect of social conformity on collective voting behavior. *Political Analysis, 12*, 76-96. DOI: 10.1093/pan/mpg015

Colorado Secretary of State. (2020). Colorado Election Results: 2020 General Election, State Offices & Questions. Retrieved from

https://results.enr.clarityelections.com/CO/105975/web.264614/#/summary?category=C_2Colorado

Colvin, R. M., Witt, G. B., & Lacey, J. (2016). Approaches to identifying stakeholders in environmental management: Insights from practitioners to go beyond the 'usual suspects'. *Land Use Policy, 52,* 266-276. DOI: 10.1016/j.landusepol.2015.12.032

Crooks, K., Burdett, C. L., Theobald, D. M., Rondinni, C. & Boitani, L. (2011). Global patterns of fragmentation and connectivity of mammalian carnivore habitat. *Biological Sciences, 366*(1578), 2642–2651. DOI:10.1098/rstb.2011.0120

Crooks, K. R., Gonzalez, M. N. & Ghasemi, B. (2022). Scientist perspectives toward the status and management of gray wolves in the western United States. *Conservation Science and Practice,* e12728. DOI: 10.1111/csp2.12728

d'Estree, T. P., Dukes, E. F., & Navarrete-Romero, J. (2002). Environmental conflict and its resolution. In Editor R. B. Bechtel & A. Churchman (Ed). *Handbook of environmental psychology* (589-606). New York: John Wiley & Sons, Inc.

Daniels, S. E. & Walker, G. B. (2001). *Working through environmental conflict: The collaborative learning approach.* Praeger Publisher.

Davila, F., Plant, R., & Jacobs, B. (2021) Biodiversity revisited through systems thinking. *Environmental Conservation, 48*, 16–24. DOI: 10.1017/S0376892920000508

Decker, D. J., Raik, D. B., Carpenter, L. H., Organ, J. F., & Schusler, T. M. (2005). Collaboration for community-based wildlife management. *Urban Ecosystems, 8,* 227-236

Decker, D., Smith, C., Forstchen, A., Hare, D., Pomeranz, E., Doyle-Capitman, C., Schuler, K., & Organ, J. (2016). Governance principles for wildlife conservation in the 21st century. *Society for Conservation Biology, 9*(4), 290-295. doi: 10.1111/conl.12211

Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Agard, J., Arneth, A., Balvanera, P., Brauman, K. A., Butchart, S. H. M., Chan, K. M. A., Garibaldi, L. A., Ichii, K., Liu, J., Subramanian, S. M., Midgley, G. F., Miloslavich, P., Molnár, Z., Obura, D., Pfaff, A., Polasky, S., Purvis, A.,

Razzaque, J., Reyers, B., Chowdhury, R. R., Shin, Y-J.,Visseren-Hamakers, I., Willis, K. J., & Zayas, C. N. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science, 366*(6471), eaax3100. DOI: 10.1126/science.aax3100.

Dickman, A. J. (2010). Complexities of conflict: The importance of considering social factors for effectively resolving human-wildlife conflict. *Animal Conservation, 13*, 458-466.

Dickman, A., Marchini, S. & Manfredo, M. (2013). The human dimensions in addressing conflict with large carnivores. In Editor D. W. Macdonald & K. J. Willis (Ed). *Key Topics in Conservation Biology 2* (110-126). John Wiley & Sons, Ltd.

Doran, R. & S. Larsen. (2016). The relative importance of social and personal norms in explaining intentions to choose eco-friendly travel options: The importance of social and personal norms. *International Journal of Tourism Research*, *18*(2), 159–166. DOI:10.1002/jtr.2042.

Emerson, K., Orr, P. J., Keyes, D. L., & McKnight, K. M. (2009). Environmental conflict resolution: Evaluating performance outcomes and contributing factors. *Conflict Resolution Quartey, 27*(1), 27-64. DOI: 10.1002/crq.247

Ericsson, G. & Heberlein, T. A. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation*, *111*, 149–159.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics,5*(1), 1-4. DOI: 10.11648/j.ajtas.20160501.11.

Farrow, K., Grolleau, G., & Ibanez, L. (2017). Social Norms and Pro-Environmental Behavior: A Review of the Evidence. *Ecological Economics*, *140*(C), 1–13.

Fieldhouse, E. & D. Cutts. (2020). Do as I say or do as I do? How social relationships shape the impact of descriptive and injunctive norms of voting. *British Journal of Political Science, 51*(4), 1516-28. DOI:10.1017/S0007123420000058

Fieldhouse, E., Cutts, D., & Bailey, J. (2020). Who cares if you vote? Partisan pressure and social norms of voting. *Political Behavior.* DOI: 10.1007/s11109-020-09661

Fishbein, M. & I. Ajzen. 2010. *Predicting and changing behavior: The reasoned action approach.* Montgomery, IL: Psychology Press.

Franchini, M., Corazzin, M., Bovolenta, S., & Filacorda, S. (2021). The return of large carnivores and extensive farming systems: A review of stakeholders' perception at an EU level. *Animlas, 11*, 1735-51. DOI: 10.3390/ani11061735

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A Social Identity Model of Pro-Environmental Action (SIMPEA). *Psychological Review, 125*(2), 245–269. DOI: 10.1037/rev0000090

Fritts, S. H., R., Stephenson, R. O., Hayes, R. D., & Boitani, L. (2003). Wolves and Humans. In Editors L. D. Mech & L. Boitani (ed). *Wolves: Behavior, ecology, and conservation* (289-316). Chicago & London: University of Chicago Press.

Galinsky, A. D. (2015). Creating and reducing intergroup conflict: The role of perspective-taking in affecting out-group evaluations. In *Toward Phenomenology of Groups and Group Membership* (pp. 85-113). DOI: 10.1016/S1534-0856(02)04005-7

Garad, J. & Kowarsch, M. (2017). Objectives for stakeholder engagement in global environmental assessments. *Sustainability, 9*, e1571. DOI: 10.3390/su9091571

Gee, M.N. & Johnson, S.K. (2022). Why do young people engage in some civic actions and not others? Exploring the roles of individual and collective civic efficacy. Journal of Community and Applied Social Psychology: 1-18. DOI: 10.1002/casp.2661

Gerber, A. S. & T. Rogers. (2009). Descriptive social norms and motivation to vote: Everybody's voting and so should you. *The Journal of Politics, 71*(1), 178-191. DOI: 10.1017/S0022381608090117

Ghasemi, B., Landon, A. C., Miller, C. A., & Williams, B. D. (2021). Trust and Emotions Predict Support for Large Carnivore Recovery in the Absence of Real Threats. Society & Natural Resources, 34(10), 1318-1337.

Gieger, N. & Swim, J. K. (2016). Climate of silence: Pluralistic ignorance as a barrier to climate change discussion. *Journal of Environmental Psychology, 47*, 79-90.

Gigliotti, L. M., Sweikert, L. A., Cornicelli, L., & Fulton, D. C. (2020). Minnesota landowners' trust in their department of natural resources, salient values similarity and wildlife value orientations. *Environment Systems and Decisions, 40*, 577-587. DOI: 10.1007/s10669-020-09766-z

Goldstein, N. J, Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research, 35*, 472-482.

Gonzalez, M. N., Heid, T., & Niemiec, R. M. (In Prep). Stakeholder perceptions of conflict in advance of an intergroup contact intervention.

Hameiri, B., Bar-Tal, D., & Halperin, E. (2014). Challenges for peacemakers: How to overcome socio-psychological barriers. *Policy Insights from the Behavioral and Brain Sciences, 1*(1), 164-171. DOI: 10.1177/2372732214548428

Hansen, H. P., Dethlefsen, C. S., Fox, G. F., & Jeppsesen, A. S. (2022). Mediating human-wolves conflicts through dialogue, joint fact-finding and empowerment. *Frontiers in Environmental Science, 10*. DOI: 10.3389/fenvs.2022.826351

Henderson, H. (2019, August). *Eastern Washington Wolf Pack Eliminated.* Retrieved from https://www.drovers.com/article/eastern-washington-wolf-pack-eliminated

Hurst, K., Stern, M. J., Hull, R. B., & Axsom, D. (2019). Addressing identity-related barriers to collaboration for conservation through the self-affirmation theory and moral foundations theory. *Conservation Biology, 34*(3), 572-580. DOI: 10.1111/cobi.13428

Jacobson, C.A. & D.J. Decker. (2017). Conservation relevancy: What does it mean to us and for us? *82nd North American Wildlife and Natural Resources Conference*, 82, 27-33.

Jimenez, A., LeDeunff, H., Gine, R., Sjodin, J., Cronk, R., Murad, S., Takane, M., & Bartram, J. (2019). The enabling environment for participation in water and sanitation: A conceptual framework. *Water, 11*(308). DOI: 10.3390/w11020308

Johnson, C. N., Balmford, A., Brook, B. W., Buettel, J. C., Galetti, M., Guangchun, L., & Wilmshurst, J. M. (2017). Biodiversity losses and conservation responses in the Anthropocene. *Science, 356*(6335), 270–275. DOI:10.1126/science.aam9317

Jones, M. S. & Solomon, J. (2019). Challenges and supports for women conservation leaders. *Conservation Science and Practice, 1*(6), e36. DOI: 10.1111/csp2.36

Jones M.S. & Niemiec, R. (2020). Social-psychological correlates of personal-sphere and diffusion behavior for wildscape gardening. Journal of Environmental Management, 276. DOI:10.1016/j.jenvman.2020.111271

Kamrowski, R. I., Sutton, S. G., Tobin, R. C., & Hamann, M. (2014). Potential applicability of persuasive communication to light-glow reduction efforts: A case study or marine turtle conservation. *Environmental Management, 54*, 583-595.

Kellert, S. R., Black, M., Rush, C. R., & Bath, A. J. (1996). Human culture and large carnivore conservation in North America. *Conservation Biology, 10*(4), 977-990.

Kent, E. E., Prestin, A., Gaysynsky, A., Galica, K., Rinker, R., Graff, K., & Chou, W-Y. (2015). "Obesity is the new major cause of cancer": Connections between obesity and cancer on Facebook and Twitter. *Jounral of Cancer Education, 31,* 453-459.

Knackmuhs, E., Farmer, J., & Knapp, D. (2019). The relationship between narratives, wildlife value orientations, attitudes, and policy preferences. *Society & Natural Resources, 32*(3): 303-321.

Kim, M. K., Douglas, M. M., Pannell, D., Setterfield, S. A., Hill, R., Laborde, S., Perrott, L., Álvarez-Romero, J. G., Beesley, L., Canham, C., & Brecknell, A. (2022). When to use transdisciplinary approaches for environmental research. *Frontiers in Environmental Science, 10*, e840569. DOI: 10.3389/fenvs.2022.840569

Landon, A. C., Miller, C.A., & Williams, B. D. (2019). Assessing Illinois residents' support for natural recolonization of apex predators. *Environmental management, 63*(2), 260-269.

Lapinski, M. K. & Rimal, R. N. (2005). An explication of social norms. *Communication Theory, 15*(2), 127-147.

Lischka, S. A., Teel, T. L., Johnson, H. E., & Crooks, K. R. (2019). Understanding and managing human tolerance for a large carnivore in a residential system. *Biological Conservation, 238*, 1-9. DOI: 10.1016/j.biocon.2019.07.034

Lischka, S. A., Teel, T. L., Johnson, H. E., Reed, S. E., Breck, S. Don Carlos, A., & Crooks, K. R. (2018). A conceptual model for the integration of social and ecological information to understand human-wildlife interactions. *Biological Conservation, 225*, 80-87.

Loker, C. A. & Decker, D. J. (1995). Colorado black bear hunting referendum; What was behind the vote? *Wildlife Society Bulletin, 23*(3), 370-376.

Lokhorst, A. M., Staats, H., van Dijk, J., van Dijk, E., & de Snoo, G. (2011). What's in it for me? Motivational differences between farmers' subsidized and non-subsidized conservation practices. *Applied Psychology, 60*(3), 337-353. DOI: 10.1111/j.1464-0597.2011.00438.x

Lundmark, C. & Matti, S. (2015). Exploring the prospects for deliberative practices as a conflict-reducing and legitimacy-enhancing tool: The case of Swedish carnivore management. *Wildlife Biology, 21,* 147-156. DOI: 10.2981/wlb.00009

Lute, M. L., Carter, N. H., Lopez-Bao, J. V., & Linell, J. D. C. (2020). Conservation professionals' views on governing for coexistence with large carnivores. *Biological Conservation, 248*, e108668. DOI: 10.1016/j.biocon.2020.168668.

Lute, M. L. & Gore, M. L. (2014). Stewardship as a path to cooperation? Exploring the role of identity in intergroup conflict among Michigan wolf stakeholders. *Human Dimensions of Wildlife*, *19*(3), 267-279.

Luyet, V., Schlaepfer, R., Parlange, M. B., & Buttler, A. (2012). A framework to implement stakeholder participation in environmental projects. *Journal of environmental management*, *111*, 213-219.

Madden, F. & B. McQuinn. (2014). Conservation's blind spot: The case for conflict transformation in wildlife conservation. *Biological Conservation, 178*, 97-106.

Manfredo, M. J. (2008). *Who cares about wildlife: Social science concepts for exploring human-wildlife relationships and conservation issues*. Spring Science+Business, LLC.

Manfredo, M. J., Berl, R. E. W., Teel, T. L., & Bruskotter, J. T. (2021). Bringing social values to wildlife conservation decisions. Frontiers in Ecology and the Environment, 19(6), 355–362. https://doi.org/10.1002/fee.2356

Manfredo, M. J. & A. Dayer. (2004). Concepts for exploring the social aspects of human–wildlife conflict in a global context. *Human Dimensions of Wildlife, 4*, 1-20. DOI: 10.1080/10871200490505765.

Manfredo, M. J., Teel, T. L., Gavin, M. C., & Fulton, D. (2014). Considerations in representing human individuals in socio-ecological models. In Editors M. J. Manfredo, J. J. Vaske, A. Rechkemmer, & E. A. Duke (eds.) *Understanding society and natural resources: Forging new strands of integration across the social sciences* (137-158). SpringerOpen.

Manfredo M. J., Teel, T. L., Sullivan, L., & Dietsch, A. (2017). Values, trust, and cultural backlash in conservation governance: The Case of wildlife management in the United States. *Biological Conservation, 214*, 303-311.

Marchini, S. & D. W. Macdonald. (2012). Predicting ranchers' intention to kill jaguars: case studies in Amazonia and Pantanal. *Biological Conservation, 147*, 213-221.

Marino, A., Ciucci, P., Redpath, S. M., Ricci, S., Young, J., & Salvatori, V. (2021). Broadening the toolset for stakeholder engagement to explore consensus over wolf management. *Journal of Environmental Management, 296*, e113125.

Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehmann, I., & Rodriguez, I. (2016). Justice and conservation: The need to incorporate recognition. *Biological Conservation, 197,* 254-261. DOI: 10.1016/j.biocon.2016.03.021

Martin, S. R. & K. McCurdy. (2009). Wilderness food storage in Yosemite: Using the Theory of Planned Behavior to understand backpacker canister use. *Human Dimensions of Wildlife, 14*(3), 206-218. DOI: 10.1080/10871200902858993

Matthes, J. Knoll, J., & von Sikorski, C. (2017). The “spiral of silence” revisited: A meta-analysis on the relationship between perceptions of opinion support and political opinion expression. *Communication Research, 45*(1), 3-33.

McCreary, S. T., Gamman, J. K. & Brooks, B. (2001). Refining and testing joint fact-finding for environmental dispute resolution: Ten years of success. *Mediation Quarterly, 18*(4), 325-427.

Meadow, R., Reading, R. P., Phillips, M., Mehringer, M., & Miller, B. J. (2005). The influence of persuasive arguments on public attitudes toward a proposed wolf restoration in the southern Rockies. *Wildlife Society Bulletin*, *33*(1), 154-163.

Mech, L. D. (2017). Where can wolves live and how can we live with them? Biological Conservation, 210, 310–317.

Myers, T. Washington Policy Center. (2020). *Wolves in Washington state: Managing final steps to recovery and post-recovery.*

Nie, M. A. (2001). The sociopolitical dimensions of wolf management and restoration in the United States. *Human Ecology Review*, *8*(1), 1-12.

Nie, M. A. (2002). Wolf recovery and management as value-based political conflict. *Ethics, Place & Environment*, *5*(1), 65-71.

Nie, M. A. (2004). State wildlife policy and management: The scope and bias of political conflict. *Public Administration Review, 64*(2), 221-233.

Niemiec, R. M., Adroin, N. M., Brewer, F. K., Kung, S. & Lopez, L. (2018). Increased neighbor interaction and fear of social sanctions: Associations with resident action to control the invasive little fire ant. *Society & Natural Resources*. DOI: 10.1080/08941920.2018.1456594

Niemiec**,** R. M., Berl, R. E. W., Gonzalez, M. N., Salerno, J., Teel, T. L., Schultz, C., Collins, M., Camera, C., & Crooks, K. R. (2022). Evidence for Rapid Public Attitude Change Towards a Conservation Initiative: The Case Study of Wolf Restoration in Colorado. *Conservation Science and Practice*. https://conbio.onlinelibrary.wiley.com/doi/10.1111/csp2.12632

Niemiec, R. M., Champine, V., Vaske, J. J. & Mertens, A. (2020). Does the impact of norms vary by type of norm and type of conservation behavior? A Meta-Analyses. *Society and Natural Resources, 33*(8), 1024-40. DOI: 10.1080/08941920.2020.1729912

Niemiec, R. M., Berl, R. E. W., Gonzalez, M. N., Camara, C., Collins, M., Teel, T. L., Salerno, J., Crooks, K. R., Schultz, C., Hoag, D., & Breck, S. (2020). Public perspectives towards and media reporting of a proposed ballot initiative for wolf reintroduction in Colorado. *Peer J, 8*, 9074-91.

Niemiec, R. M., Sekar, S., Gonzalez, M. N., & Mertens, A. (2020). The influence of message framing on public beliefs and behaviors to species reintroduction. *Biological Conservation, 248,* 1-9.

Nigbur, D., Lyons, E., & Uzzell, D. (2010). Attitudes, norms, identity and environmental behaviour: Using an expanded theory of planned behaviour to predict participation in a kerbside Recycling programme. *British Journal of Social Psychology*, *49*(2), 259–84.

Organ, J.F., Geist, V., Mahoney, S. P., Williams, S., Krausman, P. R., Batcheller, G. R., Decker, T. A., Carmichael, R. Nanjappa, P. Regan, R., Medellin, R. A., Cantu, R., McCabe, R. E., Craven, S., Vecellio, G.M., & Decker, D.J. (2012). The North American Model of Wildlife Conservation. The Wildlife Society Technical Review 12-04. The Wildlife Society, Bethesda, Maryland, USA.

Orr, P. J., Emerson, K., & Keyes, D. L. (2008). Envirionmental conflict resolution practice and performance: An evaluation framework. Conflict Resolution Quarterly, 25(3), 283-301. DOI: 10.1002/crq.209

Packer, C., Holt, R. D., Hudson, P. J., Lafferty, K. D., & Dobson, A. P. (2003). Keeping the herds healthy and alert: Implications of predator control for infectious disease. *Ecology Letters, 6,* 797–802 DOI: 10.1046/j.1461-0248.2003.00500.x

Pahl-Wostl, C. & Hare, M. (2004). Processes of social learning in integrated resources management. *Journal of Community & Applied Social Psychology, 14*, 193-206. DOI: 10.1002/casp.774

Paloniemi, R. Apostolopoulou, E. Cent, J., Bormpoudakis, D., Scott, A., Grodzińska-Jurczak, M…. Pantis, M. (2015). Public participation and environmental justice in biodiversity governance in

Finland, Greece, Poland and the UK. *Enviroinmental Policy and Governance, 25,* 330-342. DOI: 10.1002/eet.1672

Pate, J., Manfredo, M. J., Bright, A. D., & Tischbein, G. (1996). Coloradan's attitudes toward reintroducing the gray wolf into Colorado. *Wildlife Society Bulletin,* 24(3), 421-428.

Porat, R., Halperin, E., & Bar-Tal, D. (2015). The effect of sociopsychological barriers on the processing of new information about peace opportunities. *Journal of Conflict Resolution, 59*(1), 93-119. DOI: 10.1177/0022002713499719

Redpath, S. M., Young, J., Evely, A., Adams, W. M., Sutherland, W. J., Whitehouse, A., ... & Gutierrez, R. J. (2013). Understanding and managing conservation conflicts. *Trends in ecology & evolution*, *28*(2), 100-109.

Redpath, S. M., Bhatia, S., & Young, J. (2015). Tilting at wildlife: Reconsidering human-wildlife conflict. *Flora & Fauna International, 49*(2), 222-225. DOI: 10.1017/S0030605314000799

Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation, 141*, 2417-2431.

Reed, M. S., Vella, S., Challies, E., de Vente, J., Frewer, L., Hohenwallner-Ries, D., Huber, T., Nuemann, R. K., Oughton, E. A., Sidoli del Ceno, J. and van Delden, H. (2018). A theory of participation: What makes stakeholder and public engagement in environmental management work? *Restoration Ecology, 26*(1), 7-17.

Riley, S. J., Ford, J. K., Triezenberg, H. A., & Lederle, P. E. (2018). Stakeholder trust in a state wildlife agency. The Journal of Wildlife Management, 82(7), 1528-1535. DOI: 10.1002/jwmg.21501

Rimal, R. N. & Real, K. (2003). Understanding the influence of perceived norms on behaviors. *Communication Theory*, *13*, 184–203.

Ripple, W. J., Estes, J. A., Beschta, R. L., Wilmers, C. C., Ritchie, E. G., Hebblewhite, M., Berger, J., Elmhagen, B. Letnic, M., Nelson, M. P., Schmitz, O. J., Smith, D. W., Wallach, A. D., & Wirsing, A. J. (2014). Status and ecological effects of the world's largest carnivores. *Science, 343*. DOI: 10.1126/science.1241484

Rowe, G. & Frewer, L. J. (2000). Public participation methods: A framework for evaluation. *Science, Technology, & Human Values, 25*, 3–29.

Saldaña, J. (2016). *The coding manual for qualitative researchers.* Sage Publications Ltd.

Salvatori, V., Balian, E., Blanco, J. C., Ciucci, P., Demeter, L., Hartel, T., ... & Young, J. C. (2020). Applying participatory processes to address conflicts over the conservation of large carnivores: understanding conditions for successful management. *Frontiers in Ecology and Evolution*, *8*, 182.

Santos, S. & Chess, C. (2003). Evaluating citizen advisory boards: The importance of theory and participant-based criteria and practical implications. *Risk Analysis, 23*(2), 269-279.

Scheaffer, R. L., Mendenhall, W, & Ott, L. (1996). Elementary survey sampling. Belmont, CA: Duxbury Press.

Schusler, T. M., Decker, D. J., & Pfeffer, M. J. (2003). Social learning for collaborative natural resource management. *Society and Natural Resources, 15*, 309-326. DOI: 10.1080/08941920390178874

Schmitz, O. J., Raymond, P. A., Estes, J. A., Kurz, W. A., Holtgreive, G. W., Ritchie, M. E., Schindler, D. E., Spivak, A. C., Wilson, R. W., Bradford, M. A…(2014). Animating the carbon cycle. *Ecosystems, 17*, 344-359. DOI: 10.1007/s10021-013-9715-7

Sharpe, M. L., Harwell, M. C., & Jackson, C. A. (2021). Integrated stakeholder prioritization criteria for environmental management. *Journal for Environmental Management, 282*(15). 111719. DOI: 10.1016/j.jenvman.2020.111719

Shuman, V., Sander, D., & Scherer, K. R. (2013). Levels of valence. *Frontiers in Psychology, 4*.

Sillero-Zubiri, C. & Laurenson, K. (2001). Interactions between carnivores and local communities: Conflict or co-existence? Pp. 282-312 in J. Gittleman, S. Funk, D.W. Macdonald and R.K. Wayne (Eds.). Proceedings of a Carnivore Conservation Symposia. Zoological Society of London, UK.

Slagle, K. M., Wilson, R. S., Bruskotter, J. T., & Toman, E. (2019). The symbolic wolf: A construal level theory analysis of the perceptions of wolves in the United States. *Society & Natural Resources, 32*(3), 322-337. DOI: 10.1080/08941920.2018.1501525

St John, F. A. V., Edwards-Jones, G., & Jones, J. P. G. (2010). Conservation and human behaviour: Lessons from social psychology. *Wildlife Research, 37,* 658-667. DOI: 10.1071/WR10032

Sterling, E. J., Betley, E., Sigouin, A., Gomez, A., Toomey, A., Cullman, G., Malone, C., Pekor, A., Arengo, F., Blair, M., Filardi, C., Landrigan., K. & Luz Porzecanski, A. (2017). Assessing the evidence for stakeholder engagement in biodiversity conservation. *Biological Conservation, 209*, 159-171. DOI: 10.1016/j.biocon.2017.02.008

Strapko, N., Hempel, L., MacIlroy, K., & Smith, K. (2016). Gender differences in environmental concern: Reevaluating gender socialization. *Society & Natural Resources, 29*(9), 1015-31. DOI: 10.1080/08941920.2016.1138563

Talley, J. L., Schneider, J., & Lindquist, E. (2016). A simplified approach to stakeholder engagement in natural resource management: The five-feature framework. *Ecology and Society, 21*(4). 38. DOI: 10.5751/ES-08830-210438

Tajfel, H. & J. C. Turner. (1979). An integrative theory of intergroup conflict. In W. G. Austin; S. Worchel (eds.). The social psychology of intergroup relations. Monterey, CA: Brooks/Cole. pp. 33–47.

Teel, T. L., Bright, A. D., & Manfredo, M. J. (2003). Regional results from the pilot phase of the research project entitled "Wildlife Values in the West.". Project Rep. (55).

Tippet, J., Searle, B. Pahl-Wostl, C., & Rees, Y. (2005). Social learning in public participation in river basin management- early findings from HarmoniCOP European case studies. *Environmental Science & Policy, 8*(3), 287-299.

van Eeden, L., Crowther, M., Dickman, C., MacDonald, D., Ripple, W., Ritchie, E., & Newsome, T. (2017). Managing conflict between large carnivores and livestock. *Conservation Biology, 32*(1), 26-34.

van Eeden, L., Eklund, A., Miller, J., López-Bao, J., Chapron, G, Cejtin, M. R., Crowther, M. S., Dickman, C. R., Frank, J., Krofel, M… (2018). Carnivore conservation needs evidence-based livestock protection. *PLOS Biology*, *16*(9). DOI: 10.1371/journal.pbio.2005577

van Eeden, L. M., Slagle, K., Crowther, M. S., Dickman, C. R., & Newsome, T. M. (2020). Linking social identity, risk perception, and behavioral psychology to understand predator management by livestock producers. *Restoration Ecology, 28*(4), 902-910. DOI: 10.1111/rec.13154

van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin, 134*(4), 504–535. https://doi.org/10.1037/0033-2909.134.4.504

Vaske, J. J. (2019). *Survey Research and Analysis*. 2. Venture Publishing, Inc.

Vaske, J. J., Miller, C. A., Ashbrook, A. L., & Needham, M. D. (2018). Proximity to chronic wasting disease, perceived risk, and social trust in the managing agency, *Human Dimensions of Wildlife, 23*(2), 115-128. DOI: 10.1080/10871209.2018.1399317

Venumière-Lefebvre, C. C., Breck, S. W., & Crooks, K. R. (2022) A systematic map of human-carnivore coexistence. *Biological Conservation, 268*. DOI: 10.1016/j.biocon.2022.109515

Vucetich, J. A., Bruskotter, J. T., & Macdonald, D. W. (2021). Can deliberative democracy favor a flourishing relationship between humans and carnivores? *Frontiers in Conservation Science, 2*. DOI: 10.3389/fcosc.2021.680925

White, R. M., Fischer, A., Marshall, K., Travis, J. M. J., Webb, T. J., Falco, S., Redpath, M., & der Wal, R. (2009). Developing an integrated conceptual framework to understand biodiversity conflicts. *Land Use Policy, 26*(2), 242-253.

Wilson, M. A. (1997). The wolf in Yellowstone: Science, symbol, or politics? Deconstructing the conflict between environmentalism and wise use. *Society & Natural Resources*, *10*(5), 453-468.

Wittman, K., Vaske, J. J., Manfredo, M. J., & Zinn, H. C. (1998). Standards for lethal response to problem urban wildlife. *Human Dimensions of Wildlife, 3*(4), 29-48. DOI: 10.1080/10871209809359137

Woodroffe, R. & Ginsberg, J. R. (1998). Edge effects and the extinction of populations inside protected areas. *Science, 280*(5372), 2126-2128.

Young, J. K., Ma, Z., Laudarti, A., & Berger, J. (2015). Human-carnivore interactions: Lessons learned from communities in the American west. *Human Dimensions of Wildlife, 00*(1).

Zhang, X., Geng, G., & Sun, P. (2017). Determinants and implications of citizens' environmental complaint in China: Integrating theory of planned behavior and norm activation model. *Journal of Cleaner Production, 166*, 148–56.

Zimmerman, A., McQuinn, B. & Macdonald, D. W. (2020). Levels of conflict over wildlife: Understanding and addressing the right problem. *Conservation Science and Practice,* e259. DOI: 10.1111/csp2.259