THESIS

WILD HORSES IN NORTHWESTERN COLORADO:

CULTURAL VALUES OF WILD HORSES AND ATTITUDES TOWARDS WILD HORSE

MANAGEMENT METHODS

Submitted by

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ABSTRACT

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Since its creation, the Wild and Free Roaming Horse and Burro Act of 1971 has been a source of conflict and controversy on American rangelands. Studies in other regions and countries have found that divergent values about wild horses held by different groups influence similar conflicts. However, the role of values and their influence on attitudes towards wild horse management methods has not been studied in relation to conflicts over wild horse management in the western United States. We interviewed Bureau of Land Management (BLM) employees, BLM permittees, and wild horse advocates in northwestern Colorado to identify and describe values each group associates with wild horses and explore how these values are related to attitudes towards different wild horse management methods. With rising wild horse populations, paralleled by increasing conflict and media attention, this study contributes to understanding the role of values and attitudes in wild horse management controversies in the western United States.

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research can help. Dr. Larry Howery, thank you for always making sure that I have a seat at the table. It is always an honor to sit in the same table as you. Dr. Aaron Lien, thank you for always being an outstanding example of a student, instructor, and advisor; and thank you for giving me an opportunity to try to follow your footsteps. Dr. Mitchel McClaran, Dr. Larry Howery, and Dr. Aaron Lien, the idea of working with you again has been a continuous motivation for me to complete my thesis and my master's degree. I am looking forward to working with you all on my dissertation.

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nuggets when I got frustrated about wild horses. Last, but not least, I would like to thank the Varela family. Tía Maria Armida, tío Ticayo, tía Nando, and Ferny, thank you for opening doors for me and for being with me every step of the way. I simply would not be here without any of you.

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STATEMENT OF POSITIONALITY

A hallmark of good qualitative research is the researcher's ability to reflect on their own social identities, values, beliefs, and experiences, as well as their views on the nature of reality and ways of knowing, and to articulate how these elements influence their relationships to their research topic and participants. This is the purpose of this statement of positionality. My personal and academic backgrounds have had a strong influence in my positionality in this research; the one that has the most influence on it is my upbringing. I grew up in a small mining town in northern Mexico called Cananea, Sonora. When I was growing up, my mom was a schoolteacher, and my dad was a rancher. My late grandfather and my dad owned and managed the family ranch, which has been in our family for multiple generations. Growing up, I was very close to my dad and witnessed how he dedicated his life to our ranch and everything in it. Almost every morning, he got up before the break of dawn to travel one hour to the ranch to start working when the sun came up. Multiple times I saw him answer calls in the middle of the night to then see him run out the door because there was a fire in the ranch, and he had to try to contain it while the firefighters could get there in the morning. On countless occasions, I saw my father do everything in his power to save a sick animal's life. I saw the deep sorrow that filled his face when he realized that the summer rains would not be enough for his land to recover. I saw the joy in his face and heard it in his chuckle when he saw that the ranch had "greened up" or when he saw a newborn calf, foal, or any other wild animal for the first time. I saw his calloused and sometimes bloodied hands continue to do the hard work that the land and the animals in it demanded, day after day. For these and many other reasons, because of my father and many other ranchers that I have met, I have a deep admiration and respect for ranchers. I also tend

assume, that even though they are often stubborn in their ways, ranchers do what they believe is best for the land and everything in it.

There are no wild horses in Mexico, so I first learned about wild horses during the research process for a high school project. The first information that I found on wild horses was from wild horse advocacy websites. From these websites, I gathered that wild horses were native, endangered, and that the BLM slaughtered wild horses to make space for BLM permittee livestock. Later, I learned that a lot of the information on these websites was not accurate.

I moved from Mexico to the U.S. to attend college. I completed an associate's degree in Fine Arts at Pima Community College. Then I transferred to The University of Arizona (UA). In 2015 I was a few courses away from completing a B.S. degree in Communication Studies, when motivated by my interest in wild horses and ranching, I decided to pursue and acquire a B.S. degree in Natural Resources with an emphasis on Rangeland Ecology, Management, and Restoration instead. Soon after, I became a field technician and crew leader on a project led by Archer Lab at UA. The project investigated long-term ecosystem effects and trade-offs of woody plant encroachment on grazed rangelands. This project was quantitative; for a long time, this experience in research led me to believe that all scientific data had to be measurable in numbers.

In spring 2015 I was accepted to the Undergraduate Research Opportunities Consortium's (UROC) PREP/STAR Program at the UA. As a UROC-PREP/STAR scholar, I designed and led a small-scale research project on wild horses and burros. Continuing with my quantitative research path, for my research project I estimated wild horse and burro population growth rates and then used linear regression analysis to determine relationships between the population growth rates and two possible influencing factors: animal density and precipitation. I presented the results of my project "Wild Horses and Burros: Population Growth Rates and

Influencing Factors" at the UROC-PREP/STAR Summer Colloquium and as a research poster at the 21st Annual UROC Research Conference. I began reading scientific articles that found an unmistakable wild horse overpopulation problem, rising population growth rates, and damage caused to rangelands. In this time, it became difficult for me to understand how wild horse advocacy groups were against the BLM reducing wild horse populations on U.S. rangelands.

In 2017 I attended a Wild Horse Symposium at the Society for Range Management Annual Meeting in Utah. At the symposium I heard a BLM manager, a BLM permittee, and a wild horse advocate talk about their experiences with wild horse management. As a rancher's daughter, I found it easy to sympathize with the BLM permittee. The BLM permittee talked about an elderly rancher that he knew who had to downsize her herd because of wild horse population. Eventually, the woman had to sell her entire herd because she could not continue working with such small numbers and still make a living. A BLM employee spoke about wild horses starving and mares miscarrying because of wild horse overpopulation. She showed people in the room pictures of horses that had died of starvation. This meeting made me realize how real and serious the wild horse overpopulation issue was. It also made me think that there had to be solutions to the problem, especially in management. The wild horse advocate in the room heard the same things that I did, saw the same photographs, and held their ground that all that was happening was still more humane than management that removed wild horses from the range. On my family's ranch, I learned very young that suffering can be worse than death. I was able to recognize this person's passion and their appreciation for wild horses since I shared it too, but I did not understand this person's perspective or attitudes beyond this.

In 2017, I began pursuing a master's degree in Rangeland Ecosystem Science at Colorado State University (CSU) under the mentorship of Dr. María Fernández-Giménez. Since I began

my studies at CSU, I have been part of the CSU Rangeland Social-Ecological Systems Research Lab. At CSU, I have worked mostly with qualitative research. After initially proposing a research project related to a different topic and realizing that I did not have sufficient background in the appropriate theories, I focused my thesis project on the topic that I had been exploring for almost eight years before then: wild horses. Through a literature review I expanded my scientific knowledge on U.S. wild horses, The Wild and Free Roaming Horse and Burro Act of 1971, and the BLM. While I was conducting this study, I had the opportunity to speak on the record and off the record with BLM Employees and BLM Permittees about their experiences with wild horses. I learned and saw firsthand how much wild horse overpopulation is costing BLM permittees, and how even then, they still appreciate the wild horses. I listened to BLM employees as they expressed their frustrations with how little they can do and how they often feel like their hands are tied when it comes to making appropriate management decisions. I was also able to speak with wild horse advocates. A wild horse advocate invited me to the HMA and showed me how much being able to be at the HMA and observe the wild horses meant to them. During my data collection I learned that wild horse advocates are not always working against the BLM and ranchers. Wild horse advocates in northwestern Colorado go above and beyond in their free time to work with the BLM in things such as fertility control treatment administration, helping in roundups, keeping a record of horses, helping make wild horse adoptions successful, and even acting as intermediary between the BLM and the public. Because of my time spent with wild horse stakeholders of northwestern Colorado HMAs, I now have a much better idea of how complex this issue truly is. These interviews and the data obtained from them are the reason that I now understand the importance of qualitative studies. It would have been impossible for me to obtain the data that I did from a survey. I also had the opportunity to visit HMAs and see

firsthand the damage that wild horse overpopulation causes on rangelands. I heard stories about the starvation, thirst, and herd behavioral changes that wild horses are suffering because of overpopulation. During the interviews, I tried to remain impartial about wild horse management methods and values. Wild horse management is a topic that I have been following for years, so I have my own feelings and opinions regarding the situation. Additionally, my background makes it easier for me to relate and sympathize more with BLM Permittees. When I was conducting the interviews, I made a conscious effort to make sure that these did not affect the interviews. The participants gave me their time and trusted me with their answers, so as a researcher I felt a responsibility to identify, show, and interpret their answers as clearly as I could. I hope that I was able to accomplish this. On a methodological note, during the interviews I asked each participant what their preferred term was to refer to the horses and referred to them using their preferred term throughout. I did this because the meaning of the horses' "feralness" or "wildness" is often attached to term used to refer to them, and I did not want to impose a term or definition. Finally, before coding, I clearly defined each code and tried to be as objective as possible in applying the codes so that if someone else were to code the transcripts and they had not met the participants, their results would be similar to mine.

In 2020 I began working with the Natural Resources Conservation Services (NRCS) as the state grazing land specialist in the Hawaiian Islands. During my time working with NRCS, I was able to experience a position that is in some ways very similar to that of BLM Employees. I worked on grazing lands where feral ungulate overpopulation coupled with months of drought resulted in the destruction of thousands of acres of land. It was heartbreaking to speak with ranchers who had lost everything: the landscape that they had always known and cared for, forage, livestock, pets, and even soil. As a federal employee, I was able to understand the

struggle of wanting to solve an extremely complicated problem, but only be able to do what my job allowed me to do; of feeling as if I had all of the answers one minute, and then being forced to take three steps back and realize that the members of the community are the ones who have to live with the consequences of the decisions made. However, was also able to see the splendor of a community that saw the problem, sought to understand the causes, and began working together as a team, forming even the most unlikely alliances, to save their land. Science and data are the necessary tools or the missing pieces to the puzzle, but only the members of a community can put the pieces together.

Currently, I am back at UA as a first year PhD student in Ecology, Management, and Restoration of Rangelands under the mentorship of Dr. Aaron Lien. I am taking a break from wild horses and am now focusing on invasive plant species management.

With the wild horse issue as with everything else, I recognize that there are many perspectives to any phenomenon and that it is best captured when examined through every perspective; for this reason, I consider pragmatism best captures my theoretical perspective as a young researcher. However, I hold that there is a reality and that although it cannot be fully understood or described, it can be "captured by broad critical examination" (Moon, Blackman, 2014, p. 1169); therefore, critical realism best describes my ontology. As a result of my experience in both ecological and social sciences, my thoughts on meaning are that an object does not hold meaning independently, nor that meaning is entirely dependent on a subject; thus, I abide by constructionism (Moon, Blackman, 2014). My quantitative study training sometimes leads me to search for a meaning independent of the subject, but I always come back to understand that there is no such thing. As it has happened before, I am aware that with growth and my experiences, my perspective and my positionality will continue to evolve.

DEDICATION

Para mis padres,

quienes me ensenaron de sueños y como alcanzarlos.

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CHAPTER 1 - INTRODUCTION

Wild horses remain an icon of the American West in the United States. The Wild and Free Roaming Horse and Burro Act of 1971 declares that wild horses and burros "are living symbols of the historic and pioneer spirit of the West," and states that "they enrich the lives of the American people" (U.S. Congress, 1971). The Act was the result of decades of effort dedicated by Velma Johnston, also known as "Wild Horse Annie," to protect American wild horses from mistreatment and demise (Cruise & Griffiths, 2010; Kania, 2012; National Research Council, 2013). Since its creation, the Wild and Free Roaming Horse and Burro Act of 1971 has been a center of conflict and controversy on American rangelands (Bastian, et al., 1999; Beever, 2003; Brydon & Vining, 2016; Elizondo, et al., 2016; Collins & Kasbohm, 2017; Hall, et al., 2018). Previous studies in other regions and countries have found that similar conflicts are influenced by disparities among cultural values held by different groups (Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015; Bhattacharyya et al., 2011; Rikoon J., 2006; Rikoon & Albee, 1998). However, the role of cultural values and their influence on attitudes towards wild horse management methods has not been studied in relation to conflicts over wild horse management in the western U.S. Therefore, the objectives of this study are first to identify and describe the cultural values that three main stakeholder or cultural groups associate with wild horses: BLM Permittees, BLM Employees and Wild Horse Advocates. Second, the study will explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict. Third and finally, this study aims to elicit and describe the attitudes of each stakeholder group towards current wild horse

population management methods to better understand the roots of conflict among different stakeholder groups with respect to wild horse population management.

In this chapter I describe the history of wild horses in the U.S. from their arrival to the enactment of the Wild and Free Roaming Horse and Burro Act of 1971. Then, I explain current wild horse status and management and review environmental impacts that wild horses and wild horse overpopulation are known to cause. Next, I introduce the topic of social sciences as related to wild horse management and then I discuss the theoretical and methodological framework on which this study relies. The chapter concludes with a "road map" to the rest of the thesis.

History of Wild Horses in the U.S. West

The first wild equids, *Eohippus,* roamed America until their extinction at the end of the Pleistocene, approximately 10,000 to 14,000 years ago (Grayson, 1993; Young & Sparks, 2002; Beever, 2003; Garrott & Oli, 2013). Equids were not present in America again until the introduction of domestic horses (*Equus caballus*) with the arrival of the Spanish conquistadors at the end of the 16th century (Young & Sparks, 2002; Beever, 2003; Beever & Brussard, 2004; Boyd et al., 2017). Horses released accidentally or purposely soon repopulated American rangelands (Young & Sparks, 2002; Boyd et al., 2017) facilitated by lack of predators, availability of resources, and ease of mobility throughout the west (Beever, 2003). Consequently, wild horse populations reached an all-time high during the 19th century at an estimated number of over 2 million horses (Beever, 2003). Numbers began decreasing due to "mustanging" during the 19th century (Young & Sparks, 2002) and then plummeted with the enactment of the Taylor Grazing Act of 1934, which allowed removal of horses from public rangelands (Beever, 2003). Velma Johnston began advocating for the protection of wild horses after experiencing inhumane

and brutal mustanging that relied on measures such as the use of motorized vehicles and poisoning of water sources (Kania, 2012). Years of effort led to the passage of "The Wild Horse Annie Act" in 1956, which banned use of these brutal methods to gather wild horses (National Research Council, 2013).The Wild Horse Annie Act of 1956 led to further efforts to protect wild horses, which resulted in The Wild and Free Roaming Horse and Burro Act of 1971 (Cruise & Griffiths, 2010; Kania, 2012; National Research Council, 2013). The 1971 Act states that "wild free-roaming horses and burros shall be protected from capture, branding, harassment, and death" (National Research Council, 2013). In this way the Bureau of Land Management (BLM) was charged with "protection, management, and control of wild free-roaming horses and burros on public lands" (U.S. Congress, 1971; National Research Council, 2013).

Wild Horse Management on BLM Lands in the U.S. West

BLM lands are managed for multiple uses, such as recreation, mining, forestry, livestock grazing, and wildlife-related activities (National Research Council, 2013). Herd Management Areas (HMAs) are areas designated mainly for wild horses and burros and were to be "devoted principally but not exclusively to [wild horse] welfare in keeping with the multiple-use concept for management of public lands" (National Research Council, 2013). For each HMA, the BLM sets an Appropriate Management Level (AML), which is the number of wild horses that can properly thrive in an area without threatening other land uses. Because all other land uses must be considered, the AML tends to be lower than the land's carrying capacity (National Research Council, 2013). If the number of horses exceeds AMLs, the legislation allows the BLM to remove excess animals (National Research Council, 2013). The main methods used by BLM to manage wild horse populations are gathers and removals for adoption (Ashley & Holcombe,

2001). Horses are removed in a specific order based on likelihood of adoption: horses 0-5 years old are removed first, then horses over 10 years old are removed, and finally horses 6 to 9 years old are removed (Bartholow, 2007). Horses not adopted are kept indefinitely in permanent federal holding facilities in order to reduce the number of animals on public land (Bartholow, 2007). The Wild and Free-Roaming Horse and Burro Act states that animals for which there is no adoption demand are to be 'destroyed in the most humane and cost-efficient manner possible'" (National Research Council, 2013, p. 14).

However, managing wild horses has not been a simple task. The total maximum AML for the United States is 26,690 animals. The total maximum AML for the United States is 26,770 animals. As of March 1, 2020, there were 79,568 wild horses and 15,546 wild burros on BLM lands (Bureau of Land Management, 2018). Wild horse and burro populations are exceeding AML by 68,344 animals (Bureau of Land Management, 2018). Furthermore, populations have been estimated to increase at a rate of 15-20% per year (Garrott & Oli, 2013). Additionally, adoption rates are decreasing even as population numbers continue to increase (de Seve & Griffin, 2013). BLM managers have resorted to fertility control in the form of the Porcine Zona Pellucida (PZP) vaccine (National Research Council, 2013). PZP is generally seen as humane due to its short-term duration and reversibility (Beever, 2003; Bartholow, 2007). However, it is not effective in controlling wild horse populations due to its short duration and the need to vaccinate every mare, which is infeasible. Even if every mare were treated it would take several years for wild horse populations to begin declining (Fonner & Bohara, 2017).

The BLM is often criticized by Wild Horse Advocates for the way it has handled wild horse management (National Research Council, 2013). The growing attention and involvement of different interest groups has further complicated wild horse management (Elizondo et al.,

2016). Recent studies have identified two main interest groups involved: livestock producers and wild horse advocacy groups (Elizondo et al., 2016). Some livestock producers hold grazing permits in HMAs shared with wild horses and worry about decreasing availability of vegetation for their livestock (Elizondo et al., 2016). Wild horse advocacy groups debate BLM's wild horse population estimates, which often results in delays or cancellation of gathers (Huffaker et al., 1990; Bastian et al., 1999; Elizondo et al., 2016). Previous studies have found that wild horse advocacy groups strongly oppose gathers and removals, but consider fertility control more humane (Beever, 2003). No formal studies have evaluated manager, stakeholder, or public attitudes towards different kinds of wild horse management methods in the U.S.

Environmental Impacts of Wild Horses on Western Rangelands

Proper wild horse management becomes more urgent when the extensive damage wild horses cause to rangeland ecosystems is considered. Wild horse overpopulation and overgrazing showed higher vulnerability to invasive plant species (Beever et al. 2008), such as cheatgrass (*Bromus tectorum*) (Knapp, 1996). Trampling by wild horses in overpopulated areas increases soil compaction (Beever & Herrick, 2006), decreases soil aggregate stability (Davies et al., 2014), increases water runoff (Beever et al., 2008), and decreases ant mounds (Beever, 2003; Beever & Herrick, 2006). Wild horse overpopulation also negatively impacts populations of native wildlife species such as reptiles (Beever & Brussard, 2004) and the threatened Greater Sage-Grouse (*Centrocercus urophasianus*) (Beever & Aldridge, 2011; Davies, Collins, Boyd, 2014). Overpopulation of wild horses results in competition with native ungulates for resources. Competition for water is especially prevalent between wild horses and Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) (Coates & Schemnitz, 1994), bighorn sheep (*Ovis*

canadensis) (Ostermann-Kelm et al., 2008), elk (*Cervus elaphus*) (Perry et al., 2015), and pronghorn (*Antilocapra americana*) (Gooch et al., 2017; Hall et al., 2016; Hall et al., 2018). In addition to rangeland degradation, wild horse overpopulation leads to wild horses suffering from disease, starvation, and dehydration (National Research Council, 2013).

Conflict and Wild Horse Management

According to Daniels and Walker, "conflict consists of incompatibility resolving issues, parties, processes, and outcomes" (Daniels & Walker, 2001). Wehr (1979) identifies incompatibilities as fact-based, values-based, interests-based, jurisdiction-based, person-based, history-based, or culture-based. Wild horse management conflict nationwide is complex because each state and HMA throughout the country is different and is composed of different stakeholders. The research that would be necessary to analyze a conflict of this level is outside the scope of my study. For complex conflicts, such as wild horse management in the United States, it is important to consider that resolutions are not always possible, therefore we must look for ways to manage the conflict in order to make progress instead (Daniels & Walker, 2001). Seven of the eight incompatibilities identified by Wehr (1979) can be seen in the conflict between wild horse management stakeholder groups in northwestern Colorado. I observed evidence of these seven conflict types during non-formal interactions with the participants and in the interview data. Table 1.1 illustrates and defines each of the seven incompatibilities, how each incompatibility expresses itself between wild horse management stakeholder groups in northwestern Colorado, and then provides examples of these incompatibilities.

Table 1.1 Incompatibilities among three wild horse management stakeholder groups in northwestern Colorado, illustrating multiple aspects of conflict.

Incompatibility Type	Incompatibility among Groups
Fact-based: when groups do not agree about what the "facts" or "truth" about the issue are.	BLM Permittees and BLM Employees disagree with Wild Horse Advocates about the origins of wild horses.
Values-based: when groups do not agree on what should determine how a decision is made.	Value differences exist among all three stakeholder groups (see Chapter 2).
Interests-based: when groups cannot agree on who gets what resources.	BLM Permittees and BLM Employees have different interests than Wild Horse Advocates, especially with regard to prioritizing forage for livestock vs habitat for wild horses.
Jurisdiction-based: when groups disagree on who should be making the decisions.	All groups are incompatible. Some BLM Permittees believe ranchers would manage wild horses best, while Wild Horse Advocates think nature should "manage" them.
Person-based: when there are interpersonal compatibility issues.	Incompatibility was present between BLM Permittees and Wild Horse Advocates, who sometimes express negative views of individuals from the other group. Some wild horse advocates expressed negative views of individuals from the BLM Permittee group
Culture-based: when there are disagreements caused by different components of culture, such as identity.	Culture-based incompatibility is present between all three groups (see Chapter 2). Stakeholders within each group hold a similar "set of beliefs and assumptions", often heavily influenced by their group's role and identity as stakeholders in wild horse management.

Social Science Research on Wild Horse Management

Many studies have investigated the wild horse population dynamics and the ecological impacts of wild horses, but the social or human dimensions of wild horse management are less studied. Existing research focuses primarily on the economics of wild horse management, with a few studies that focus on cultural and socio-political dimensions. Economic studies have estimated the opportunity costs of having wild horses on public lands instead of wildlife and livestock, showing significant losses (Bastian et al., 1999). Elizondo et al. (2016) also showed that the supply of wild horses for adoption exceeds the demand. Other economic studies have focused specifically on the economic advantages of using fertility control as a means of population management. These studies have estimated the costs and benefits of using long-term contraceptives (de Seve & Griffin, 2013) and have determined that contraceptives are more

effective at controlling populations when combined with other strategies such as gathers and selective removals (Bartholow, 2007; Fonner & Bohara, 2017).

Although multiple authors (Symanski,1994; Rikoon, 2006; Nimmo, Miller, 2007; National Research Council, 2013) agree that the conflict surrounding wild horses is deeply rooted in political and social issues, research in these areas is scarce. Research on political issues has analyzed citizen participation and expert analysis in Canada using wild horses as an example (Brydon & Vining, 2016). Linklater et al. (2002) use the wild horse debate in New Zealand to argue that biological research is driven by political crises. Other social science research has focused more specifically on the socio-cultural aspects of wild horses, although none of this work is from the U.S. West (Rikoon, Albee, 1998; Rikoon, 2006; Bhattacharyya et al., 2011; Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015). Battacharyya et al. (2011, 2014, 2015) conducted a series of studies on this topic in the Chilcotin region in Canada, focusing mainly on the First Nations and government agencies. The first of these studies focuses on language and terminology (Bhattacharyya et al., 2011). Examining definitions and cultural meanings of "wild" and "feral," Bhattacharyya et al. (2011) argue that "feral" connotes illegitimacy, associating the species with being a pest. Although the wild horse discourse is often framed around this dichotomous debate regarding the use of the words "wild" and "feral", Bhattacharyya et al. argue that the discourse in the Chilcotin region is an expression of different cultural value perspectives. Bhattacharyya et al. (2011) follow Barnes (1986) in defining culture as "a set of beliefs and assumptions developed by a given group in its effort to cope with the problems of external adaptation and internal integration" (Barnes, 1986; Bhattacharyya et al., 2011, p. 617). Values can be defined as a noun or as a verb. As a noun, values are "a stable, meaning-producing super-ordinate cognitive structure," (Manfredo, 2008, p. 142). As a verb,

they are "people's assignment of meaning, goodness, or worth" (Manfredo, 2008, p. 142) onto an object. Values influence attitudes (Manfredo, 2008). Attitudes are the evaluation of an object and can involve an affective component (emotions towards an object), a cognitive component (beliefs about an object), or a conative component (behaviors related to an object) (Manfredo, 2008). According to Bhattacharyya et al. (2011).

The second study in the series focused on the value that wild horses have for the Tsilhqot'in communities in the Chicoltin region (Bhattacharyya & Larson, 2014). Tsilhqot'in argue that wild horses are as valuable for their livelihoods and culture as any native vegetation or wildlife and perceive wild horse management as part of landscape management (Bhattacharyya & Larson, 2014). This study described how different groups value wild horses and how those differences in values influence management approaches (Bhattacharyya & Larson, 2014). Bhattacharyya and Larson (2014) found that social, political, and cultural values attributed to a species determine if the species will be revered, ignored, or vilified. These two studies in the Chilcotin region relied on data collected using participant observation, semi-structured interviews, and informal discussions with Aboriginal and non-Aboriginal residents, employees of the Ministry of Forests and Range and the Ministry of the Environment, and non-governmental organizations (NGOs) (Bhattacharyya et al., 2011; Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015).

In the last study, Bhattacharyya and Murphy (2015) reviewed literature and unpublished data, assessed vegetation of the Chilcotin area, and explored "local ecological and cultural knowledge and perceptions" on wild horses (Bhattacharyya & Murphy, 2015, p.433). They concluded that wild horse issues are not only ecological, but also social, cultural, and political, adding that managers should not assume studies from other regions to apply to the region in their

charge (Battacharyya & Murphy, 2015). The wild horses of Chilcotin differ from those in the U.S. because their territorial range is not known, and they are mixed with branded and domesticated horses. In contrast, U.S. wild horses are confined to BLM HMAs, are unbranded, and not domesticated (Bhattacharyya et al., 2011; National Research Council, 2013).

Rikoon (1998, 2006) conducted a similar set of studies in the southeastern U.S., in Missouri's southern Ozarks. This research focused on the Missouri Wild Horse League (MWHL) and the National Park Service (NPS), a federal agency not bound by the Wild Horse and Burro Act (National Research Council, 2013). The first study proposes that environments, landscapes, and the features that compose them are dynamic social constructs that change constantly as values placed on them are also always changing (Rikoon & Albee, 1998). Rikoon and Albee (1998) thus argue for the importance of cultural researchers to document the beliefs, values, and knowledge that give meaning to landscapes and environments. Conflict is common where there are competing cultural constructs, which often relate to social power struggles (Rikoon & Albee, 1998). In the case of Missouri's southern Ozarks, the NPS wanted to remove a band of 25 wild horses because they were not native species, while MWHL considered wild horses as part of the landscape and elements of cultural value (Rikoon & Albee, 1998). Rikoon and Albee (1998) analyzed these two competing constructs and recommended involving local people in park management to meet ecological and cultural needs.

Reevaluating the same case almost 10 years later, Rikoon (2006) found that groups such as MWHL were not only fighting specific social constructs, but also the ascendance of the NPS, whose cultural beliefs and values conflicted with theirs. These groups fear the growing power of agencies like the NPS, which use their environmental protection mission to exert power over resources and social environments, overriding local community priorities like resource access.

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Nimmo and Miller (2007) reviewed ecological and human dimension studies of wild horse management in Australia. Like American wild horses, Australian wild horses hold a dichotomous status as pests and national icons (Nimmo & Miller, 2007). In Australia, wild horse management methods include ground-shooting, gathering and trapping, helicopter shooting, immobilization, and fertility control (Nimmo & Miller, 2007). Shooting from helicopters is viewed as the most practical and humane management method for wild horse population control (Nimmo & Miller, 2007; Hampton et al., 2016; Hampton et al., 2017). Although they might be a good option ecologically and economically, wild horse management methods vary in social acceptability (Nimmo & Miller, 2007). Although focused on Australia, Nimmo and Miller's (2007) review introduces four case studies that illustrate how controversial wild horse management can be (Nimmo & Miller, 2007), including one U.S. case. The U.S. case described an individual arguing that the BLM was removing wild horses to benefit local ranchers (Nimmo & Miller, 2007). Nimmo and Miller (2007) conclude by suggesting more research and stating that sound ecological science and sound social science together can aid wild horse managers in making the most ecologically and socio-politically correct decision possible.

Aligned with this call for more social research, Nimmo et al. (2007) surveyed Victoria residents to learn more about public preferences regarding different management methods. They found that 79% of respondents did not view wild horses as a pest, and that those who did perceive wild horses as a pest were more likely to approve of lethal management methods (Nimmo et al., 2007). Among lethal methods, immobilization and mustering and trapping were the most acceptable, followed by ground shooting; helicopter shooting was the least acceptable to survey respondents (Nimmo et al., 2007). The survey results also suggested that location-

specific research and raising public awareness of damage caused by wild horses could reduce political controversy (Nimmo et al., 2007).

This review shows that socio-cultural research on wild horses exists, but that findings are highly context specific, and the existing research is limited to Canada, the U.S. Ozarks, and Oceania (Australia and New Zealand). Wild horse management by the BLM in the western United States has yet to be studied through a socio-cultural lens. In the U.S. West, the main groups involved in wild horse management controversies are BLM managers, BLM permittees, and wild horse advocacy groups. No research has explored the values that these groups attach to wild horses or the attitudes they hold towards different wild horse management methods.

Social Acceptability of Natural Resource Management Methods

Wild horses have been studied by researchers from various disciplines including ecologists, economists, political scientists, folklorists, and anthropologists. Human Dimensions of Wildlife, an emerging natural resource social science field, integrates social science with human-wildlife relationships to improve wildlife management and conservation efforts by providing managers with information about public values (Manfredo, 2008). This field, and the field of Human Dimensions of Natural Resources more broadly, have applied theories from social psychology to study human attitudes, values and behaviors, and specifically, to investigate the social acceptability of different natural resource management practices. Brunson (1996) defines "social acceptability" as an attitudinal orientation towards specific natural resource conditions or practices and may lead to behavior (Brunson, 1996). If a condition or practice is acceptable, behavior to change this will not be initiated, but if a condition or practice is unacceptable then behavior to change or stop it may be elicited (Brunson, 1996). This idea is

grounded in Fishbein and Ajzen's (1975) 'Theory of Reasoned Action'. .Stern et al. (1995) introduced a theory known as the value–attitude–behavior (VAB) hierarchy (Manfredo et al., 1999; Manfredo, 2008). to explain environmental concern and theorize that the factors of the hierarchy follow in the order of Figure 1.1.

      Applying the VAB theoretical framework and associated methods, studies of public attitudes towards wildlife and other natural resource issues assess the social acceptability of specific management methods in natural resources. Attitude studies are prevalent because information on attitudes may be used to predict human behavior. Additionally, understanding attitudes facilitates understanding and describing a group's thoughts on specific objects or issues (Manfredo, 2008). Finally, people are self-aware of their own attitudes and therefore able to express and report them, which may not be the case with values (Manfredo, 2008).

Position within social structure

⬇

Values

⬇

General beliefs

⬇

Specific beliefs and attitudes

⬇

Behavioral commitments and intentions
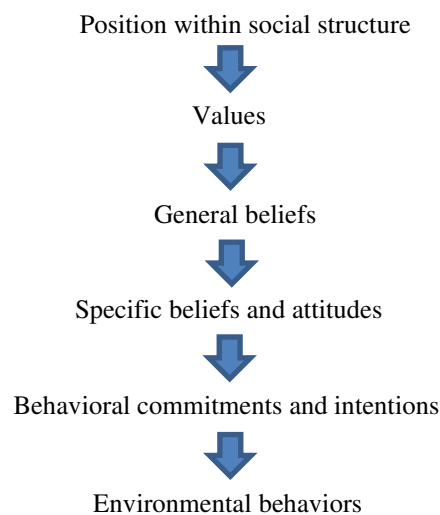
⬇

Environmental behaviors

Figure 3.1. value–attitude–behavior (VAB) hierarchy
(Manfredo, 2008, p.151)

      The VAB framework has been applied to the study of attitudes towards "problem species" and social acceptability of different natural resource management methods across a range of wildlife such as coyotes (*Canis latrans*) (Sponarski et al., 2015), wolves (*Canis lupus*

(Bruskotter et al., 2009; Jacobs et al., 2014), and moose (*Alces alces*) (Browne-Nuñez, Vaske, 2006), as well as feral species such as feral pigs (*Sus scrofta*) (Zivin et al., 2000; Harper et al., 2016; Caplenor et al., 2017) and feral cats (*Felis catus*) (Lloyd, Miller, 2010). All these studies have used different survey methods to collect data. Although wild horses in the U.S. West hold different legal status and meaning from both wildlife and other feral animals, several of these survey studies yielded findings that may have relevance for wild horse management. In a study on the public acceptability of wolf control methods, Bruskotter et al. (2009) found that acceptability of different methods varied among different social groups (e.g. hunters, farmers, wildlife advocates), and that attitudes towards methods were related to beliefs about wolf impacts. Similarly, Sporanski et al (2015) found that attitudes towards coyotes and coyote control methods varied among different groups (local residents, part staff, and visitors) and was influenced by personal experiences. They found that acceptability of lethal control increased with perceived increases in threat levels from coyotes. Finally, in a study related to feral hogs, Caplenor et al. (2017) found high stakeholder concern for negative ecological and economic impacts of feral hogs, overall negative attitudes towards feral hogs, and high acceptability of both lethal and non-lethal control methods. Collectively these studies suggest that different social groups hold different views and attitudes towards management of specific wildlife species, and that attitudes towards management methods were often tied to perceived threats or negative impacts of the species.

In summary, attitudinal and social acceptability studies using the VAB Framework have addressed a broad spectrum of issues concerning natural resource management. However, most such studies use survey methods as their only or main mode of data collection method. A more qualitative methodology could allow researchers to obtain information beyond closed-ended

survey questions provided in questionnaires. Furthermore, when the phenomenon at hand has not been studied, such as public attitudes towards wild horses in the U.S. West, qualitative open-ended inquiry is an essential prerequisite to development of robust quantitative instruments such as surveys. In addition, few if any attitude and acceptability studies have examined cultural values and the role that they play in relation to attitudes towards and social acceptability of management methods.

Theoretical and Methodological Framework

Existing studies on wild horse management suggest that wild horse controversies are often rooted in differences among groups' cultural values, attitudes, and resulting social acceptability of management methods (Rikoon, Albee, 1998; Rikoon, 2006; Nimmo & Miller, 2007; Bhattacharyya et al., 2011; Bhattacharyya, Larson, 2014; Bhattacharyya, Murphy, 2015), with few exceptions (e.g. Nimmo & Miller 2007). However, the field of Human Dimensions of Natural Resources has yet to address wild horse management in the U.S. West. Therefore, I focused on identifying and describing the distinct cultural values attributed to wild horses by the three of the major stakeholder groups in conflict over wild horse management in the western United States: BLM Permittees, BLM Employees, and Wild Horse Advocates. I then elicit and analyze their attitudes towards specific wild horse population management methods.

This study combines two main theories and associated methodologies. First, it draws on the Values Attitudes Behavior Hierarchy as a framework for conceptualizing the relationships between a person's values and their attitudes, and specifically the social acceptability of specific management methods. Second, it draws on the concept of the cultural landscape model advanced by Stephenson (2008). In this study, I define value following Manfredo (2008) as "people's

assignment of meaning, goodness or worth," to an object, in this case wild horses. I also follow

Avrami et al (2000) and Stephenson (2008, p. 129) in understanding values to be "a social

construction arising from the cultural contexts of a time and place". Therefore, cultural values

are values shared by a group or community that share a culture (Stephenson, 2008). Stephenson

suggests that people in landscape policy, administration, and development control tend to base

their decisions on the value given to a landscape as determined by the assessment method or

discipline used, while values that do not fit into these typologies are usually not considered

(Stephenson, 2008) and that, "the roots of the conflict lie – in the failure to recognise and

reconcile the multiple values associated with specific places" (Stephenson, 2006, p. 35). In

response, Stephenson developed a Cultural Values Model in relation to Landscapes (Stephenson,

2006; Stephenson, 2008).

Stephenson developed their Cultural Values Model based on semi-structured interviews

focusing on the question 'what is important to you about this landscape?' (Stephenson, 2008,

p.129). First, data were analyzed to determine "value" statements for individual interviewees,

and then they were analyzed for "value" statements shared or supported by other interviewees

(Stephenson, 2008). The Cultural Values Model was developed to "provide a framework to

understand the potential range of values that might be contained in a given landscape"

(Stephenson, 2008, pg.136). I took a similar approach to identify and describe the cultural values

attributed to wild horses by BLM Permittees, BLM Employees, and Wild Horse Advocates.

Conclusion and Organization of the Thesis

To date, no human dimensions studies have focused on wild horse management on BLM

lands in the U.S. West. Rising wild horse populations (Garrot and Oli, 2013) that threaten both

rangeland ecosystems and wild horse welfare, together with increasing controversy, conflict, and media attention (Elizondo et al., 2016) underscore the urgency of understanding the roots of this conflict and finding constructive ways to move forward with management. To address this challenge, and gaps in the existing literature, this thesis addresses the following three objectives: 1) identify and describe the cultural values that BLM Permittees, BLM Employees and Wild Horse Advocates associate with wild horses; 2) explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict; and 3) elicit and describe the attitudes of each stakeholder group towards current wild horse population management methods in order to better understand the roots of conflict among different stakeholder groups with respect to wild horse population management.

A human dimensions study on wild horses managed by the BLM contributes to understanding wild horse management controversies and to identifying potential solutions. The results of this study provide BLM managers and other decision-makers with insights on the cultural values, attitudes, and social acceptability of specific management methods held by three of the main groups involved in wild horse management. This would provide BLM managers with information as to where commonalities among groups might offer approaches for conflict management and where differences among groups could result in further conflict. It will also help reveal if conflicts stem from differences in attitudes or if they are grounded in differing cultural values, which could make them harder to overcome (Daniels & Walker, 2001).

This thesis is organized as follows. In Chapter Two I identify and describe the cultural values that the three main stakeholder or cultural groups associate with wild horses and explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict. In Chapter Three I elicit and describe the

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attitudes of BLM Permittees, BLM Employees, and Wild Horse Advocates towards current wild

horse population management methods. Finally, in Chapter Four, I conclude this thesis by

summarizing the main findings and their implications for future management, policy, and

research. All recruitment materials and interview guides are included in Appendices 1 to 3.

Chapters Two and Three are written as stand-alone articles, each with its associated literature

review, methods, results, and discussion. Thus, there is some overlap between these chapters,

especially in the introduction and methods sections.

CHAPTER 2 - CULTURAL VALUES AND THEIR POTENTIAL ROLE IN WILD HORSE

CONFLICT

In 1971, President Nixon signed the Wild and Free Roaming Horse and Burro Act. The Act declared that wild horses and burros were "living symbols of the historic and pioneer spirit of the West," and stated that "they enrich the lives of the American people" (U.S. Congress, 1971). Since its creation, wild horse management has been a cause of conflict and controversy on U.S. public rangelands (Bastian et al., 1999; Beever E. , 2003; Brydon & Vining, 2016; Garrott & Oli, 2013; Elizondo et al., 2016; Hall et al., 2018; Collins & Kasbohm, 2017). Previous studies suggest that conflicts of this sort could be motivated by divergences in values including cultural values (Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015; Bhattacharyya et al., 2011; Rikoon 2006; Rikoon & Albee 1998). Stephenson (2008) found that stakeholders in landscape policy, administration, and development control tend to base their management decisions on the value attributed to a landscape as determined by the assessment method or discipline used. Values that do not fit into these typologies are usually not considered and Stephenson posits that conflict is rooted in the lack of understanding of the multiple values associated with a specific landscape (Stephenson, 2006). In response, Stephenson developed a cultural values model for landscapes (Stephenson, 2006; Stephenson, 2008). In the case of wild horses, management decisions also rarely consider the multiple values that wild horses hold for different stakeholder or interest groups. In this study, I used an approach similar to Stephenson's to 1) identify and describe the cultural values that the three main stakeholder or cultural groups associate with wild horses, and 2) explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict.

Background

The first wild equids, *Eohippus,* roamed America until their extinction at the end of the Pleistocene, approximately 10,000 to 14,000 years ago (Grayson, 1993; Young & Sparks, 2002; Beever, 2003; Garrott & Oli, 2013). Equids were not present in America again until the introduction of domestic horses (*Equus caballus*) with the arrival of the Spanish conquistadors at the end of the 16th century (Young & Sparks, 2002; Beever, 2003; Beever & Brussard, 2004; Boyd et al., 2017). Horses released accidentally or purposely soon repopulated American rangelands (Young & Sparks, 2002; Boyd et al., 2017) facilitated by lack of predators, availability of resources, and ease of mobility throughout the west (Beever, 2003). Consequently, wild horse populations reached an all-time high during the 19th century at an estimated number of over 2 million horses (Beever, 2003). Numbers began decreasing due to "mustanging" during the 19th century (Young & Sparks, 2002) and then plummeted with the enactment of the Taylor Grazing Act of 1934, which allowed removal of horses from public rangelands (Beever, 2003). Velma Johnston began advocating for the protection of wild horses after witnessing inhumane and brutal mustanging that relied on measures such as the use of motorized vehicles and poisoning of water sources (Kania, 2012). Years of effort led to the passage of "The Wild Horse Annie Act" in 1956, which banned use of motorized vehicles and poisoning of water sources to gather wild horses (National Research Council, 2013).The Wild Horse Annie Act of 1956 led to further efforts to protect wild horses, which resulted in The Wild and Free Roaming Horse and Burro Act of 1971 (Cruise & Griffiths, 2010; Kania, 2012; National Research Council, 2013). The 1971 Act states that "wild free-roaming horses and burros shall be protected from capture, branding, harassment, and death" (National Research Council, 2013). In this way the Bureau of Land Management (BLM) was charged with "protection, management, and control of wild free-

roaming horses and burros on public lands" (U.S. Congress, 1971; National Research Council, 2013)

Since the passage of the Wild and Free Roaming Horse and Burro Act, wild horse management has become even more complicated due to growing attention and involvement of different interest groups (Elizondo et al., 2016). Elizondo et al. (2016) identified two main interest groups involved: livestock producers and wild horse advocacy groups (Elizondo et al., 2016). According to Elizondo et al. (2016), livestock producers who hold grazing permits in HMAs shared with wild horses are concerned about decreasing availability of vegetation for their livestock and wild horse advocates debate BLM's wild horse population estimates, and delay or prevent wild horse gathers with the intent to protect populations of wild horses. As the primary land managers and decision makers, BLM employees are often caught in the middle of these two stakeholder groups. However,, this conflict and the reasons behind it are more complex in practice (Huffaker et al., 1990; Bastian et al., 1999; Elizondo et al., 2016). Past studies did not consider the roles of BLM Employees in this conflict. Also, few studies in the United States have investigated the conflict among these three main stakeholder groups.

Many studies have investigated the ecological impacts of wild horses and wild horse population dynamics; yet the social or human dimensions of wild horse management are less studied. Existing research focuses primarily on the economics of wild horse management, with a few studies that focus on socio-cultural dimensions. However, none of this existing work is based the U.S. West (Rikoon & Albee, 1998; Rikoon, 2006; Bhattacharyya et al., 2011; Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015). Battacharyya et al. (2011) conducted a series of studies with this focus in the Chilcotin region in Canada, where they observed two stakeholder groups: First Nations and government agencies. In their studies,

Bhattacharyya et al. (2011) argued that differences in discourse and disagreement on wild horse management between these two groups is an expression of different cultural value perspectives. They also recognized how the Tsilhqot'in perceived wild horses as valuable for their livelihoods and culture as any native vegetation or wildlife and perceive wild horse management as part of landscape management (Bhattacharyya & Larson, 2014). This study then described how different groups in the Chilcotin region valued wild horses for different reasons and how those differences influenced management approaches (Bhattacharyya & Larson, 2014). Bhattacharyya and Larson (2014) observed that social, political, and cultural values attributed to a species determined if the species would be revered, ignored, or vilified by the groups in question.

Although past studies on wild horse management suggest that wild horse issues are rooted in differences in how wild horses are valued by different social groups (Rikoon & Albee, 1998; Rikoon, 2006; Nimmo & Miller, 2007; Bhattacharyya et al., 2011; Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015), wild horse management has not yet been considered in the field of Human Dimensions of Natural Resources. Human Dimensions of Wildlife is an emerging natural resource social science field that integrates social science with human-wildlife relationships to improve wildlife management and conservation efforts by providing managers with information about public values (Manfredo, 2008). This field, and the field of Human Dimensions of Natural Resources more broadly, has applied theories from social psychology to the study of human attitudes, values and behaviors, and specifically, to the study of the social acceptability of different natural resource management practices.

Culture is "a set of beliefs and assumptions developed by a given group in its effort to cope with the problems of external adaptation and internal integration" (Barnes, 1986; Bhattacharyya et al., 2011, p. 617). Values are "people's assignment of meaning, goodness or

worth" (Manfredo, 2008, p. 142) onto an object. Therefore, cultural values are values shared by a group or community that share a culture (Stephenson, 2008). Stephenson suggests that natural resource decision-makers tend to base their decisions on the value attributed to a landscape as determined by the assessment method or discipline used and that values that do not fit into these typologies are usually not considered (Stephenson, 2008). As a result, "the roots of the conflict lie – in the failure to recognise and reconcile the multiple values associated with specific places" (Stephenson, 2006, p. 35). In response, Stephenson developed a cultural values model for landscapes (Stephenson, 2006; Stephenson, 2008). Stephenson's Cultural values model was developed from 34 semi-structured interviews focusing on the question 'what is important to you about this landscape?' (Stephenson, 2008, p.129). Data were initially analyzed to determine "value" statements for individual interviewees, and then for "value" statements shared or supported by other interviewees (Stephenson, 2008). The Cultural values model was developed to "provide a framework to understand the potential range of values that might be contained in a given landscape" (Stephenson, 2008, pg.136). Here, I take a similar approach and to determine cultural values for wild horses managed by the BLM in western Colorado, USA.

Thus, the purpose of this study was to identify and describe the different cultural values associated with wild horses by BLM Managers, BLM Permittees, and Wild Horse Advocates to better understand conflict surrounding their management. The objectives of this study were to: 1) identify and describe the cultural values that these three main stakeholder groups associate with wild horses, and 2) explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict or its management.

Methods

Study Sites

This study focuses on three Bureau of Land Management (BLM) Wild Horse Management Areas (HMAs) in northwestern Colorado: The Little Book Cliffs Wild Horse Area, managed by the Grand Junction Field Office, the Piceance-East Douglas HMA, managed by the White River BLM Field office, and the Sand Wash Basin HMA, managed by the Little Snake BLM Field Office. Table 2.1 summarizes the characteristics of these three HMAs.

Table 2.1. Characteristics of the three Herd Management Areas (HMAs) in northwestern Colorado associated with this study (Source: (Bureau of Land Management, n.d.).).

HMA	Field Office	Location	Size	Topography and Dominant Vegetation	AML	Wild Horse Population in 2021
Little Book Cliffs Wild Horse Area	Grand Junction Field Office	Northeast of Grand Junction, CO	36,113 acres	Canyons and plateaus with pinyon-juniper.	90-150	146
Piceance-East Douglas Horse Management Area	White River Field Office	Southwest of Meeker, CO and east of State Highway 139.	190,130 acres	Rolling hills of pinyon-juniper and sagebrush steppe	135-235	838
Sand Wash Basin Horse Management Area	Little Snake Field Office	45 miles west of Craig, CO	157,730 acres	Ridges and mesas with sagebrush and bunchgrass, saltbush and pinon-juniper woodlands.	163-363	818

These three sites are managed by BLM Employees. BLM Permittees hold permits that allow them to graze livestock on the land under specific guidelines determined by the BLM and enforced by BLM Employees. It is important to note that some BLM Permittees in this study area voluntarily removed their livestock from the HMAs temporarily during the study and did not graze as much as their permits allowed, in order to allow the land recover from drought and grazing stress. caused by wild horse overpopulation, livestock grazing, and wildlife use. In these

HMAs, Wild Horse Advocates work closely with BLM Employees as volunteers, helping them keep records of horses on the HMAs, horse lineage, PZP administration, HMA tours, and HMA range infrastructure maintenance.

Data Collection

Recruitment. I recruited 13 participants from three different stakeholder groups: BLM Permittees, BLM Employees, and Wild Horse Advocates. The three BLM Permittees interviewed were associated with two HMAs, the seven BLM Employees were associated with all three HMAs, and the three Wild Horse Advocates were associated mainly with two HMAs, but some are invovled in all three HMAs to some capacity. All of the participants in this study had to be associated with at least one of the three HMAs in the study area to be considered for inclusion.

For this study, I defined BLM Employees as federal government employees with direct responsibility to manage wild horses or other resources within HMAs. Participants in the BLM Employees group work or have worked in at least one of the three western Colorado HMAs.

BLM Permittees were livestock producers who hold or have held grazing permits within an HMA or adjacent to an HMA. The latter were considered because they also tend to be involved in wild horse issues. additionally, there are no BLM Permittees holding grazing permits in Little Book Cliffs because it is a Wild Horse Area (HA) as opposed to an HMA, which means that livestock grazing is not allowed, and wild horses are the primary concern of the HA.

I defined Wild Horse Advocates as members of a wild horse advocacy group based in Colorado. There are four main Wild Horse Advocacy groups in northwestern Colorado: Friends of the Mustangs, Piceance Mustangs, Wild Horse Warriors, and Sand Wash Advocacy Team

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(S.W.A.T.). Participants in the Wild Horse Advocates group are or have been members of at least one of these groups.

I identified the BLM managers of each BLM field office using information provided in the BLM website (Bureau of Land Management, n.d.) and personal referrals from key informants such as Colorado State University (CSU) faculty and Extension staff. The BLM managers and key informants directed us to other potential participants. I contacted potential participants directly via telephone call (Appendix 2) or e-mail (Appendix 3) and invited them to participate in the study. All 13 participants were recruited through this process.

Interviews. I used a semi-structured interview protocol to guide interviews (see Appendix 1). Questions were centered on the participant's experience with wild horses, how they value wild horses, and their attitudes towards different wild horse management methods. Stephenson (2008) developed the landscape cultural values model based on 34 semi-structured interviews focusing on the question 'what is important to you about this landscape?' (Stephenson, 2008, p.129). Similarly, to acquire data to develop a cultural values model for wild horses, a section of interview questions focused on the question "Why are wild horses important to you?" Participants decided where the interview would take place. (Full interview protocol is available in Appendix 1.) The interviews took place at participants' offices, participants' homes, HMAs, and restaurants. The study was conducted under the CSU IRB Protocol #19-8518H with free, prior, and informed consent. Consent was obtained orally and before the interview. All interviews were audio-recorded with participants' consent.

Data Analysis

The audio-recorded interviews were professionally transcribed and crosschecked twice with the recordings for accuracy. After being reviewed twice for accuracy, transcriptions were considered ready for coding.

The transcribed interviews were coded using NVivo (NVivo 12). Interviews were first coded for values participants attributed to wild horses. My analysis involved three rounds of coding. Following Stephenson's (2008) work, I coded for statements that showed that expressed importance or significance towards wild horses. Using this approach, I first coded the 13 interviews for value statements. After an initial round of coding for values statements, I categorized the value statements into 8 categories: aesthetic value, educational value, utilitarian value, historical value, genetic value, memory/identity value, social value, and spiritual value. In the second round of coding, I re-analyzed the 13 interviews using these 8 final values codes and ensured that each values statement was assigned to one of these codes.

Finally, as I began to draft my initial findings, I recognized that different stakeholder groups varied not only in which values they expressed towards wild horses, but also the strength with which they held these values. Therefore, I undertook a third round of coding to assign a strength to the degree to which each stakeholder group held each value. First, I noted the number of participants in each stakeholder group that mentioned each value. Then, I determined the overall strength with which each value was held within each stakeholder group by calculating the average proportion of interview time spent talking about each value, across all interviewees in each stakeholder group, including participants who did not discuss that value (Appendix 5). Finally, I divided the strength values into three classes: low (>0-0.9% of interview time), moderate (1.0% - 1.9% of interview time) and high (> 1.9% of interview time).

Trustworthiness

The trustworthiness and qualitative rigor of this study were ensured by abiding to the standards set forth by Lincoln and Guba (1985). Credibility is the "internal validity" of the study. Guba suggests addressing credibility through prolonged engagement, persistent observation, peer debriefing, triangulation, referential adequacy materials, and member checks. The credibility of this study was addressed mainly by using referential adequacy materials and peer debriefing. Referential adequacy materials took the form of field notes, coding memos audio-recordings of the interviews, having the interviews professionally transcribed, and then reviewing the transcripts twice for accuracy. These materials were triangulated with field notes taken before, during, and after each interview.

Transferability shows that the data collected is a representative sample of the general population. To address transferability, I sought stakeholders of all three HMAs in northwestern Colorado and selected three stakeholder groups that are present in most, if not all HMAs: BLM Permittees (or ranchers), BLM Employees, and Wild Horse Advocates. However, this was a small sample and generalizability is only for the possibility of conducting studies of the same nature to understand cultural values of wild horses held by stakeholder groups involved in wild horse management in HMAs.

Dependability indicates that a study is replicable. Dependability was addressed by designing an interview schedule that is applicable to all three stakeholder groups and coding these interviews in the same manner. This process was thoroughly described the methods section and in coding memos (Appendix 4). Confirmability is the extent to which objectivity is places on data itself rather than on the researcher. I addressed confirmability by providing general

descriptions of the stakeholder groups or cultural groups, detailed quotes of their statements, and a description of the analysis process.

<div align="center">**Results**</div>

In total, I identified 8 values across the 13 interviews. The section below describes each of the values of wild horses that I identified from the interviews and the stakeholder groups(s) that held the value, illustrated by excerpts from the interview transcripts.

Aesthetic Value

Aesthetic beauty was identified as a value in interviews with BLM Permittees, BLM Employees and Wild Horse Advocates. Participants from all three groups discussed the physical beauty of the horses.

One of the three BLM Permittees interviewed commented briefly on the Aesthetic Value of the horses (0.11% of the interviews). When asked why wild horses were important to them, the BLM Permittee explained simply, *"I think if you look at the local area, historical value to them, the aesthetical value to them, I think there is a value there."* Four out of seven BLM Employees mentioned that they valued horses for their beauty, saying that they enjoyed going out and seeing the horses when they were out working on the HMAs (0.36% of the interviews). All three Wild Horse Advocates commented on the physical beauty of the horses and spoke more than the other stakeholder groups about this value (1.75% of interviews). One of the Wild Horse Advocates described the horses as *"big and magnificent."* All Wild Horse Advocates interviewed photographed the horses as a hobby and one of them talked briefly about a photography club integrated by other Wild Horse Advocates. The beauty of the horses interacting with other horses and their environment was also discussed by Wild Horse Advocates,

> *"Oh man, that is just special. When do you get to do that? It's not the same seeing horses in a pen. Being out there and just going wow. Seeing that band, the other day, I know I do*

<div align="center">29</div>

a ton of work for these horses, but that made it worth it. That made it worth it. They're beautiful and they are healthy."

Educational Value

Wild horses held educational value for some participants. Statements were coded as "educational value" when stakeholders mentioned learning or teaching something in a situation where a horse was part of the process. This value appeared rooted in life experiences. One of three BLM Permittees interviewed talked at length about educational value of wild horses (0.96% of all Permittee interviews). They spoke about their childhood and about learning how to catch and train wild horses with their father and grandfather. *"I caught a lot of them back at the time. Not a lot of them as in hundreds or anything like that. Maybe 20 or something like that; 20, 30 at the most. I don't know for sure."* The BLM Permittee told us about their experience,

> *"I started breaking horses when I was 12, there the first one that I did in earnest and after I was 14. Then in '71 and '72 and '73 there, I stayed in the camps with the cowboys and stuff and learned from them what to do."*

With deep regret, the BLM Permittee talked about how they wished that they could have had the opportunity to teach their own children how to catch and train wild horses as their father and grandfather had taught them. However, catching and training wild horses is no longer permitted by the law.

> *"The fact of the matter is it bothers me that my son is a first generation [in the family] that doesn't know how to catch a wild horse and deal with it once it's caught. He's of course helped when we are getting them in here and into the corral with the saddle horses and that, but he's never been around one when one was roped or anything and then have to lead him 20 miles to home, you know, and stuff like that there. It's as foreign to him as it is to somebody that grew up in the city. And that bothers me. You want to be able to pass on what you know to your children, you know?"*

Although the BLM Permittee did not have the opportunity to teach their own children how to catch and train wild horses, they did teach other children in their community how to train wild horses.

Two of the seven BLM Employees had learning experiences with horses that were

adopted through the BLM's Wild Horse and Burro Adoption Program (0.49% of interviews).

One BLM Employee remembered being given a wild horse to ride when working at a ranch as a

teenager. They recalled the freezemark running down the side of the wild horse's neck, a

distinctive characteristic of wild horses gathered for adoption by the BLM. They also recalled the

horse facilitating their learning experience when working with cattle, *"It was an awesome horse,*

I had some experiences on that, that the horse itself and its instincts probably saved my bacon a

couple of times," they explained, "*Cow turns on you and I was a kid that didn't have a clue and*

that horse saved my bacon." Another BLM Employee remembered training a wild horse with

their grandfather as a teenager, *"We trained it together and then he ended up giving me that*

horse."

One of the BLM Employees also talked about the educational value that wild horses held

in their community,

> *"We partner with 4H programs, we're doing that in Colorado too, so we're doing that out*
> *in Montrose in a couple weeks. We did it last year with 4H programs, the kids come out,*
> *and their supervisor, and they basically adopt these horses. They go and train them, and*
> *then at the end of the summer they come back and do a little horse show and adoption*
> *with them. And those 4H kids, you know, they're young, they're enthusiastic, and they're*
> *learning about wild horses and the issues, and training, and feeding, and pet care, and*
> *all of that stuff, so that's a big deal."*

One of the three Wild Horse Advocates commented on the educational value of wild

horses, accounting for 2% of all Wild Horse Advocate interviews.

> *"Kids would just ride him all day. They'd climb on him from the fence. There would be*
> *three of them on him. One time there was a tarp tied there, and he started to go under it.*
> *Well, the tarp hit the kids right here, so they're kind of pulling, and they're stuck, and it's*
> *like what are you doing over there? [The horse] was just standing there, and the kids*
> *were ... anyway, he was great."*

This Wild Horse Advocate talked in depth about this wild horse's gentle and tolerant nature, expressing that it was a great horse for children and beginning riders. Therefore, they saw a value in this wild horse in teaching unexperienced riders how to ride horses.

Genetic Value

Throughout the interviews, participants constantly referenced the genetic value of wild horses, although sometimes indirectly. Passages were coded as "genetic value" when interviewees commented on the origin of the horses, their ancestry or descendants, their breed, coloring, and overall physical appearance. Therefore, this value is closely related to aesthetic value and historical value. Genetics appeared to be a cause of controversy concerning wild horse management. . BLM Permittees and BLM Employees spoke of genetics in relation to breeding and genetic viability of the wild horse population. However, Wild Horse Advocates saw genetics as a means of proving that the northwest Colorado wild horse herds descend from the first herds introduced to America by the Spanish conquistadores. Thus, Advocates hoped that genetic analysis would support their claims for the historical importance of these herds, as discussed in 'Historical Value'.

Two of the three BLM Permittees mentioned the importance of considering genetics in breeding and in maintaining genetic viability of wild horse herds when making management decisions (1.19% of interviews). One of these Permittees talked about wild horse genetics relating it to lineage of the horses that they owned,

> *"When I got a little bit older, there was a couple, one was out of a wild horse mare and the neighbor's stud. Then another one was out of a half wild horse mare and the next stallion in line that we got and things like that there. All of the horses... Or not all of them, because we got a couple of boughten ones, but most of the horses on the place here are descended from that stuff there."*

Three of seven BLM Employees talked about genetic value (0.87% of interviews). Like Permittees, BLM Employees were concerned about the importance of maintaining genetic viability within the herds and the controversy that surrounds it, as the following excerpt illustrates, *"and that's where [some people] can get very passionate is that you can have a permanent impact to the horse, to the population, to genetic viability and sustainability and all of those things."* Then, they explained how the BLM had resources to maintain viable genetics and sustainable wild horse populations.

Two out of three Wild Horse Advocates spoke about genetic value. They observed genetics to determine the origin of the wild horses in their HMAs. One Wild Horse Advocate talked about how their group had been working with the BLM to carry out DNA studies,

> *"So far, we've gotten 28 DNA samples back and only two of those show any possibility of Quarter Horse in them. So, and there's a lot of other old breeds that I've never even heard of before. Argentina Creole. There's a lot of that out here. So, there's just stuff here that's ... it's not the homesteaders' horses they brought in. These came from other places. We have some draft, and we know that there were people out here that raised horses for the army that turned them loose. And, you know, and so it's a mix."*

Another Wild Horse Advocate talked about genetics concerning the coloring of the wild horses. They mentioned grullos, a white horse, black horses, red horses, a bay, paints, blue roans, and even an appaloosa, which they affectionately referred to as an "appy".

Historical Value

Most of the stakeholders interviewed attributed historical value to wild horses. However, the meaning of this value varied among the three groups. Two out for the three BLM Permittees spoke about historical value, accounting for 1.31% of their interviews. As previously mentioned in "Aesthetic Value", one BLM Permittee grouped together historical and aesthetic values of wild horses. Another BLM Permittee talked about the history of wild horses as it interlaced with

their own life history. They recalled wild horses in the area before the Wild and Free Roaming

Horse and Burro Act of 1971 and talked about how things changed once the act was passed.

> *"There was also, when I was a kid, the Ute Tribe still had a lot of land there, and they had horses loose out there on the BLM that were, in name only, different than wild horses,"* they recalled, *"but anyway. When they all left and moved to the reservation, I was about maybe 10, or maybe a little older but not much older and my dad went over to the headquarters and made a deal with the tribe and bought that entire herd of horses."*

As mentioned later in the "Utilitarian Value" section, one BLM Permittee valued the role

that wild horses played during the Great Depression and ultimately in saving their family ranch.

Four of seven BLM Employees talked about the historical value of wild horses, often

referring to them as 'living history' (0.94% of interviews). When asked why wild horses were

valuable to them, one BLM Employee answered, *"The value of the wild horse is, it's in my*

opinion, is it's living history." One BLM Employee referred to them as *"a living legend of the*

west".

Two of the three Wild Horse Advocates also talked about the Historical Value of wild

horses (1.95% of the interviews). They discussed the re-introduction of horses by the Spanish in

the 1500s. However, Wild Horse Advocates often associated Historical Value with domesticated

horses, especially as they expressed the importance of horses in human history. *"And they have*

gone out and they have fought battles for us. They have pulled us across the country," a Wild

Horse Advocate expressed, *"You know, they… horses are a huge part of our history in how we*

moved across the nation."

Memory/Identity Value

For this value, I considered any mention memories or stories of memories related to wild

horses that expressed value towards the horses. Two BLM Permittees did not express this value.

In the case of the third BLM Permittee, a large portion (10.48%) of their interview was related to

this value. This was not surprising, as wild horses had been constantly present in their everyday life and therefore had come to form a big part of their life. Thus, although only one of the three Permittees discussed memory/identity, it accounted for 3.49% of interview time across all Permittees interviewed.

Six of the seven BLM Employees had memories that gave value to the horses (2.05% of interviews). One BLM Employee talked extensively about this value,

> *"I think it actually kind of goes back to, and that presents part of the challenge for wild horses too, is those early memories. You know, when I was a kid, I rode a wild horse that had been adopted by a guy. I was around horses with my dad and my grandpa growing up."*

Then they added how they thought that other people might value horses for similar reasons,

> *"They like seeing them out there, they like having them out there, most people you talk to, when you bring up a horse, they can come up with some kind of story. You know, 'When I was a kid...' Just like mine. When I was a kid my dad, or my grandpa, or I had, when I was a kid, a horse. It doesn't even have to be wild, just a horse is enough to connect them to what's out there and bring interest and some kind of nostalgia to it."*

This proved correct when another BLM Employee talked about their experience training a wild horse with their grandfather.

Two out of three Wild Horse Advocates had memories that attributed value to horses, but mostly to domesticated horses (0.30% of their interviews). Two Wild Horse Advocates had memories with domesticated horses, which they continuously related to wild horses.

> *"Well, I had access to ranches, my grandparent's ranch, until I was in high school. I used to ditch school and go horseback riding. The field was right outside of high school, and I will go across the field and ride horses. So, horses have always been a part of my life."*

Another Wild Horse Advocate had very different memories with wild horses. This Wild Horse Advocate had adopted wild horses before, and their memories were often of adopting and riding the horses,

"Once I started riding [my mare] and found out what these mustangs could do, oh wow. When I got [another horse], and he got to be about two years old, and it was time to start putting the saddle on him, well, I'd just take him out and turn him loose. Somehow, I got away with that."

The Wild Horse Advocate had also worked very closely with BLM Employees for years, so some memories were pertaining to wild horse management,

"I'd send people different ways to look for horses and that. It's like oh I'll go this way, so I was out that way and the helicopter and [the BLM Employee] and his buddy were out there. I said, 'Hey. See that little hill there. There's supposed to be a truck bed around it.' I said, 'Could you fly around it and kind of look for it?' [another BLM Employee] comes on the radio to the BLM guy and goes, 'I'm paying him a thousand bucks an hour and you want him to look for a truck bed? I don't think so.' Darn. We have a lot of fun."

Social Value

I coded passages as "social" when participants expressed a valued social benefit that happened because of involvement with wild horses. Only one of the three BLM Permittees mentioned something pertaining to Social Value of wild horses. However, this was long before the passing of Wild and Free Roaming Horse and Burro Act of 1971*, "there, I stayed in the camps with the cowboys and stuff and learned from them what to do."* The BLM Permittee did not find this value in wild horses anymore, resulting in 0% of interview time across all three Permittees.

Two out of seven BLM Employees spoke of social value (0.30% of the interviews). One BLM Employee talked about how they perceived that there were some people that valued wild horses because it resulted in increased social connections and interactions,

"One thing, I think there's this social connection. There's this 'I'm part of a group, and my group cares about something and so I'm good and important because I also care about that thing, that something.' You see that in a lot of other things too, so I think there's that aspect that I do care about that'. That's one thing, I think."

Another BLM Employee talked about valuing horses because they noticed that they were valued by the community,

"I think I go off of what the locals that have been around for a long time. I really value their opinion. And what they have to say about the horses. I haven't run into a local yet that hasn't ranched out there for years and years, you know it's a family business, and it just keeps getting passed on from generation to generation. And talking to them, and hearing them talk about, even when they were kids, there was horses."

All three Wild Horse Advocates commented on social aspects, such as forming new friendships, through wild horse activities (1.77% of interviews). For example, a Wild Horse Advocate said,

"Then I joined a photograph club and there [were two women], and they were friends at the time. So, we started going back and forth and they were helping me learn the names [of the wild horses] and all the best places where to see them, and all of those things. Now I have another friend, who we go out in camping and watch the horses move around and come in and water, and stuff."

Two Wild Horse Advocates talked in depth regarding the social dynamics between the members of the different Wild Horse Advocacy groups in the area.

Spiritual Value

Spiritual value was identified when a participant mentioned spirituality specifically. Only two participants, both Wild Horse Advocates, mentioned spirituality (2.19% of interviews). One of them talked in depth about how it is a reason other Wild Horse Advocates value wild horses,

"And you'll hear a lot of people talk about coming to the Basin for healing. They feel like the wild horses spiritually are very healing. And it is, it's a very grounding place to come. So, I think everybody has a different reason for being here, but I do think that a lot of the people that I come out here with, it really is about the healing nature that the wild horses have. It's more a spiritual experience for an awful lot of them. I was out here last year with a friend and we were talking about some of the different personalities, and she said, 'But you need to remember that everybody that's out here is broken, and they are here for a reason. And everybody's coming here to find answers.' And I think that is true, and I think you see that in a lot of the different people. They are looking for something and that's why they are probably drawn here, for a lot of them."

This Wild Horse Advocate talked about how being at the HMA made them feel more grounded, helped them realize how insignificant their issues really were, and gave them a fresh look on life to be able to face those issues.

Utilitarian Value

Utilitarian values were one of the most widely and strongly held values in the three stakeholder groups. All three BLM Permittees mentioned utilitarian value, accounting for 6.89% of interviews. Six of the seven BLM Employees talked about utilitarian value, making up 1.56% of their interviews. Only one Wild Horse Advocate mentioned utilitarian value, but this accounted for 10.45% of the interview (3.48% across all Advocate interviews). Three types of utilitarian values were identified in interviews: economic value, value as resources, and value as riding animals. All of these denote use or utilitarian values:

Economic. Economic value refers to comments made regarding monetary value of wild horses. The circumstances of economic value have changed over time, as the following excerpt from an interview with a BLM Permittee illustrates.

> *"In the 30s, there was lots of wild horses around here and stuff. My grandpa and some of the other guys over west of here in Utah, they had a big horse trap and they'd run in horses there and they'd take them to a big ... not a pasture, but a big round lot that they built, and they'd catch wild horses until they had a hundred in there, about. Then they'd take turns going in there and driving them around that. A guy in front and a guy in back, and they'd break them to drive. They'd drive, then they'd take them and head for [town] and put them on the railroad and ship them." Then when World War II came there, then they didn't even ship them then. They'd catch them there and that and pull their mane and tails, because that's where the value was on them. During the Depression and the beginning of the war, the horse was worth $10 and the mane and tail hair was worth $30, because they were making bomb sites out of the hair. Anyway, so they'd pull the mane and tails and turn them back loose because it was a renewable resource."*

The BLM Permittee attributed this as the reason to why their family had been able to keep their ranch during the Great Depression. A younger BLM Permittee saw a new kind of economic value in the horses, *"It's a huge tourist attraction here in... And so, a lot of people really base our tourism off the wild horses."* However, they also recognized that the horse herds also had to be carefully managed,

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"I think if we had a manageable herd of what it was originally meant to be, they bring people to this community, huge tourism. You know, it's a huge attraction and people really do like them. And I'm all about the community, like this town struggles. It really does."

Only one BLM Employee expressed an economic value of the horses. However, this was unrelated to their position as a BLM Employee, *"My dad was an outfitter, so we used some wild horses. Some, not wild horses, domesticated I would say. So that was part of growing up, part of our livelihood, I guess."*

Although Wild Horse Advocates made mention of tourism, none commented on the economic value of tourism or other economic values related to wild horses.

Resource. During the interviews, some participants expressed value for wild horses as a resource but did not specify what type of resource. One BLM Permittee said, *"I see the horses as a resource."* Two BLM Employees mentioned how wild horses are *"one of multiple resources that we have,"* and *"one of the uses or resources that use public land themselves."*

Riding. Five of thirteen participants had prior experiences riding wild horses. All of the experiences mentioned were positive. Because of this, they valued wild horses for the experience of riding them, and specifically for their hardiness and sure-footedness as riding animals. One BLM Permittee talked about adopting wild horses, "*We've adopted horses. Years, years ago, we adopted a couple horses, and I mean they're good horses*".

As mentioned above in "Education Value", one BLM Employee rode a wild horse when they worked at a ranch as a teenager. They talked about how the horse knew what to do when working with cattle even when they didn't. Another BLM Employee remembered riding wild horses on the job,

"But I also work with a guy who had adopted wild horses. He was our district range lead. Then we did range days, we often times we'd take his wild horses out, trained wild horses, and used them to ride and cover more country. They were awesome, because they

grew up where there was difficult terrain. When we would take them out on difficult terrain, it was nothing."

One BLM Employee had adopted wild horses,

"Right now, I have a BLM, he's the BLM wild horse at my home. He's been there gosh when did we get him, 2006 he was gathered as a two-year-old. So, I don't know how old does that make him now? Anyways he's 15 or 16 years old and he's a rideable horse. He was trained by the prison. He's a good horse."
Only one Wild Horse Advocate talked about riding horses and expressed riding value for

wild horses, *"Well, I only had a couple for a long time and then I got involved with wild horses*

and at one point I was up to nine. Some of them were kind of rescues. A lot of them I rode." The

Wild Horse Advocate had countless stories about their experiences riding wild horses and how

much they enjoyed it.

Discussion

In this study, I argue that the three main stakeholder groups involved in wild horse

management can be viewed as distinct cultural groups in the context of wild horse management.

All three groups shared most of the cultural values, however they diverged in the strength with

which the values were held, creating a unique cultural value set associated with each group. In

this section, I describe why and how BLM Permittees, BLM Employees, and Wild Horse

Advocates can be seen as different cultural groups in the context of wild horse management.

Then I compare similarities and differences in cultural values for wild horses among the three

groups. Finally, I examine how differences in cultural values associated with wild horses could

be motivating conflict between groups, and where commonalities among groups might offer

approaches for conflict management.

Stakeholder Groups as Distinct Cultures that Value Wild Horses Differently

Members of the three stakeholder groups observed, BLM Permittees, BLM Employees, and Wild Horse Advocates, can be viewed as members of similar or different cultures depending on the definition of "culture" used. In this study, I adhered by Bhattacharyya et al.'s definition of "culture" and viewed the groups only within the context of wild horse management. In this context, I found that each group held a distinct set of beliefs and assumptions about wild horses and their management (Barnes, 1986; Bhattacharyya et al., 2011, p. 617). To support my argument that each stakeholder group can be considered a distinct culture, I describe the specific experiences and beliefs shared by each stakeholder group related to wild horses and draw on my values findings to paint a holistic picture of the cultural values each group holds towards wild horses.

The three BLM Permittees interviewed had similar careers as livestock producers. All of them had owned, raised, trained, and bred domesticated horses for work; some had also owned, raised, trained, and bred wild horses for work. Due to their positions as livestock producers, they all viewed wild horse overpopulation as a problem, because wild horses compete with their livestock over forage and damage rangeland health. When it came to management, BLM Permittees believed that the wild horses per se were not a problem, but that current wild horse management was.

BLM Permittees' values reflect their lived experiences with and beliefs about wild horses. BLM Permittees live close to the HMAs and work at the HMAs at least a few days every week. They have interacted and shared land with the wild horses for most of their lives and thus Permittees deeply valued wild horses for their historical, educational, and memory/identity values. Permittees also hold a utilitarian value for horses, more specifically for work, riding, and

formerly as an income source. Because of their jobs and lifestyles, Permittees see horses as a resource, tool, or aid to help them get their work done. Permittees recognized genetic and aesthetic values of wild horses. They mentioned that they enjoyed seeing wild horses on the HMAs. Unlike BLM Employees or Wild Horse Advocates, BLM Permittees did not express spiritual or social values related to wild horses.

BLM Employees interviewed all worked in the same agency, and some in the same offices, and had similar careers and educational backgrounds. They all work directly or indirectly in wild horse management. Because of this, BLM Employees tend to perceive wild horses as one of the natural resources that they are charged with managing. Because they work directly or closely with wild horses, they have to make management decisions that are often problematic, especially because of conflicting ideas between the other two groups: BLM Permittees and Wild Horse Advocates. Regarding management, BLM Employees attempt to find decisions that they consider are best for the environment, but that also take into consideration the interests of these other two groups.

BLM Employees held high historical value for wild horses. They also held moderate educational, and utilitarian (riding) values for wild horses. Although their job is to manage wild horses and other resources in their respective HMAs, part of their job is also to educate the public on the resources that they manage. The history of wild horses is an important part of this education, as it explains what the animal is, its significance, and why the agency has decided to manage them as they do. Many BLM Employees commented on riding wild horses for work, and they praised the utility of wild horses for cutting cattle and for riding, especially in rugged terrain.

Finally, Wild Horse Advocates did not share similar jobs or educational backgrounds with one another. Their jobs and livelihoods did not depend directly on wild horse management, or the resources affected by the horses. Some Wild Horse Advocates had owned, raised, trained, and bred domesticated horses; one Wild Horse Advocate had owned, raised, and trained wild horses. However, Wild Horse Advocates had done this mainly for pleasure in contrast to BLM Permittees, who did it for work. Wild Horse Advocates all shared a similar fascination and interest in horses, but even more so in wild horses. Wild Horse Advocates believed that wild horses were not the same as domesticated horses. They viewed wild horses as entirely distinct from domesticated horses. Because of this perception, Wild Horse Advocates believed that wild horses should be managed differently from domesticated horses or other livestock. Wild Horse Advocates also held a high value for genetics. For them, genetics are a way to keep track of horses on the range and they believe that it could be a way to prove how some of the horses in the area might be descendants of the first horses brought to America by Spanish conquistadores. All of the Wild Horse Advocates also shared a deep appreciation for the social value of wild horses; neither of the other two groups expressed this value in the same manner. Wild Horse Advocates often talked about their relationship with other Wild Horse Advocates in their own group and in other groups. They expressed appreciation for time spent together on the range, off the range, conversing about wild horses, and about personal matters as a result of being brought together by their common interest in observing and advocating for wild horses. Although some Wild Horse Advocates knew each other before becoming involved with wild horses, others met each other by joining a group, by spending time at HMAs, by being involved in wild horse centered events, and by working with the BLM. One Wild Horse Advocate even boasted about having had a good relationship with BLM Employees in the area over the years. One Wild Horse

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Advocates expressed having a high value for riding wild horses. However, they did not mention economic or other utilitarian values. So, although Wild Horse Advocates shared utilitarian value with the other two groups, this only applied to riding value.

Similarities and Differences in Three Stakeholder Groups' Cultural Values

In her study on cultural values, Stephenson stated that "the roots of the conflict lie – in the failure to recognize and reconcile the multiple values associated with specific places" (p. 35) In wild horse management, the series of studies conducted in the Chilcotin region and in Missouri's southern Ozarks loosely supported this statement (Rikoon, Albee, 1998; Rikoon, 2006; Bhattacharyya et al., 2011; Bhattacharyya, Larson, 2014; Bhattacharyya, Murphy, 2015). However, none of the studies in the southern Ozarks identified or observed values specifically. In this study, I found that the three stakeholder groups held similar values. However, they expressed them differently. Further, the value sets held by each group diverged in other ways. Members of the three stakeholder groups spoke about these values from different perspectives, for different reasons, and placed differing importance on similar values. Figure 2.1 illustrates the different value sets of each group, showing the relative strength of value for each group.

BLM Permittees and BLM Employees shared high memory/identity value, low aesthetic and educational values, and no spiritual value. Both groups work closely with or around wild horses. Their livelihoods depend on wild horse management to some degree. Therefore, it is not surprising that both groups share memory/identity value. Similarly, wild horses hold less social value for these groups, perhaps because they interact with wild horses for work rather than pleasure. Even when BLM Permittees and BLM Employees held values with a different strength,

the differences in strength were not too dramatic. BLM Permittees and Wild Horse Advocates shared a strong utilitarian value, especially when it came to riding.
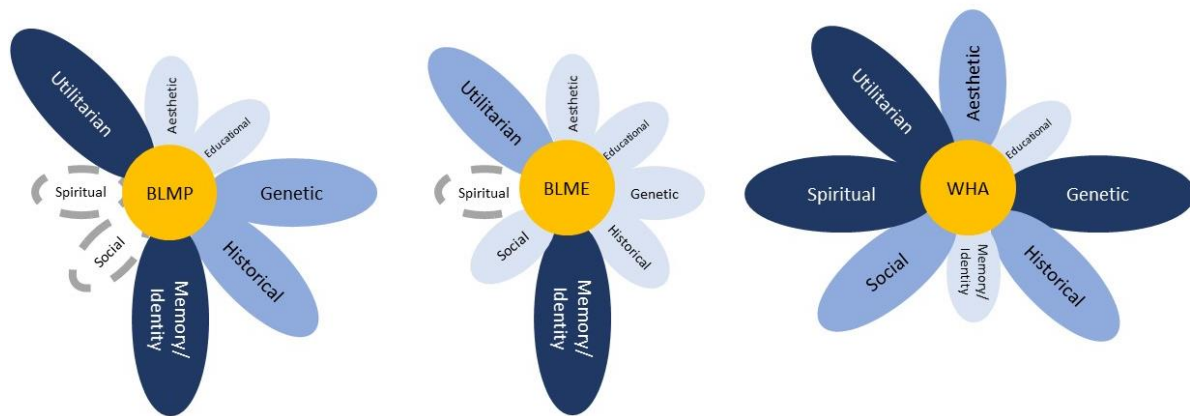
Figure 2. Cultural values of stakeholder groups, depicted using petal diagrams. BLMP = BLM Permittees, BLME = BLM Employees, and WHA = Wild Horse Advocates. The size and darkness of petal color of indicates relative strength of values held by each group, with darker and larger petals denoting more strongly attributed value. Dashed lines around petals indicate that this value was absent from the group's value set. Strength was determined by calculating the average amount of interview time spent discussing each value across all participants in each stakeholder group. Strength values were divided into three classes: low (>0-0.9% of interview time), moderate (1.0% - 1.9% of interview time) and high (> 1.9% of interview time).

Differences in strength of values could be one cause of conflict. BLM Permittees and Wild Horse Advocates differ in the strengths with which they express aesthetic, genetic, memory/identity, social and spiritual values for wild horses.

Having a clearer understanding that differences in cultural values held by different stakeholder groups may be one root of conflict in wild horse management does not offer a magic fix-it-all solution to wild horse management issues. However, understanding distinct cultural values of Permittees and Wild Horse Advocates could offer BLM officials a tool to understand the stakeholders they work with, what they value, and how these values may influence preferred or acceptable management options. Identifying and building on shared values could also help develop common ground for BLM Permittees and Wild Horse Advocates to work together. For example, both BLM Permittees and Wild Horse Advocates attributed a strong utilitarian value

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and a moderate historical value to wild horses. Thus, making management decisions that support this value or justifying decisions with reference to utilitarian or historical values may make decisions acceptable to both groups. However, if BLM relies on historical value in this way, it would be important for the three groups to work with an historian to write a well-documented history of the wild horses in the area. Although both BLM Permittees and Wild Horse Advocates held utilitarian values, they did so for different reasons. For most BLM Permittees, wild horses held all sorts of utilitarian value so long as the horses did not suffer. For Wild Horse Advocates, wild horses mostly held riding value.

Although both groups held moderate historical values for wild horses, participants in each group expressed very different views on the origins of wild horses in the area. Each group, in turn, imbued historical value based on these differing views of the horses' origins combined, in the case of Permittees and BLM Employees, with their own life experiences of this history. By working together to determine where the horses come from, the three groups may find more common ground on management decisions.

This study has several limitations. The sample size is small, especially for BLM Permittees and Wild Horse Advocates. This study is also specific to northwestern Colorado. Thus, it would be inappropriate to generalize beyond my specific participants and this study's HMAs. Nevertheless, my analysis illustrates how a cultural values approach can be applied to the wild horse issue and suggests that it may be useful to extend such qualitative research to other HMAs in other states and regions. In addition, future qualitative research could extend the inquiry to examine cultural values associated with public lands in HMAs as well as wild horses. For example, some participants responded to questions about the value of wild horses with discussion about the value of the HMAs that they frequently visited. This suggests they may

value wild horses as an attribute of the HMAs. In addition, qualitative studies of stakeholder values like this one lay the groundwork for large-sample quantitative surveys that could determine the prevalence of these values across these stakeholder groups more broadly, and statistically evaluate the relationships between such values and stakeholders' attitudes towards different wild horse management options.

In northwestern Colorado, as well as nationwide, wild horse management is a controversial issue. Conflict complicates and sometimes impedes management decisions and actions. In this study, every single participant expressed care about conserving wild horses and attributed value to wild horses. Even BLM Permittees, whose work and livelihoods are heavily affected and who are suffering losses because of wild horse overpopulation, saw value in wild horses. "*The sad part is it's not really the horses that are the problem*" one BLM Permittee explained, "*I mean if the horses would have been managed properly from day one or if they would be, I don't think we'd have the problems we have today. Everyone could enjoy the horses and yet the natural resource would be in much better condition than it is today.*" The problem is not the wild horse, but rather the disagreement over how wild horses should be managed. As people argue about how wild horses should be managed, the animals suffer the effects of overpopulation in the forms of disease, starvation, and dehydration, as well as rangeland degradation (National Research Council, 2013). Understanding cultural values associated with wild horses offers one approach to understanding and potentially addressing the conflict among stakeholders that continues to challenge wild horse management.

CHAPTER 3 - STAKEHOLDER ATTITUDES TOWARDS WILD HORSE

MANAGEMENT METHODS

In the 1950s a woman known as "Wild Horse Annie", advocated for the protection of wild horses after witnessing inhumane and brutal mustanging practices (Kania, 2012). Her efforts were successful, and the Wild and Free Roaming Horse and Burro Act was signed in 1971 (U.S. Congress, 1971). Understanding the consequences that protection without management could have on the wild horses and the land, Wild Horse Annie began advocating for the act to better address management (Kania, 2012). Since then, wild horse management continues to be a cause of conflict and controversy on United States public lands, especially Bureau of Land Management (BLM) lands (Bastian et al., 1999; Beever, 2003; Brydon & Vining, 2016; Garrott & Oli, 2013; Elizondo et al., 2016; Hall, et al., 2018; Collins & Kasbohm, 2017). Some studies suggest that this conflict is a result of differences in attitudes (Nimmo & Miller, 2007; Nimmo et al., 2007; National Research Council, 2013); additionally, none of these studies have been conducted in the United States. In this study, I conducted interviews in northwestern Colorado to 1) elicit and describe the attitudes of BLM Permittees, BLM Employees, and Wild Horse Advocates towards current wild horse population management methods, to 2) better understand the root of conflict among these three groups.

Background

Wild Horse Management on BLM Lands in the U.S. West

In the 1950s, Velma Johnston, better known as "Wild Horse Annie", advocated for the protection of wild horses after witnessing inhumane and brutal mustanging practices (Kania,

2012). Years of effort led to the passage of the Wild and Free Roaming Horse and Burro Act of 1971 (Cruise & Griffiths, 2010; Kania, 2012; National Research Council, 2013). The 1971 Act states that "wild free-roaming horses and burros shall be protected from capture, branding, harassment, and death," and directed the Bureau of Land Management (BLM) to protect, manage, and control of wild free-roaming horses and burros on public lands (U.S. Congress, 1971; National Research Council, 2013). Since the act was signed, managing wild horses has proved to be a challenge; horse population numbers have rapidly increased, causing vast ecological damage to public rangelands (National Research Council, 2013). Additionally, various management methods and even management itself are met with public opposition (National Research Council, 2013). In the following sections, I review in more detail existing literature on the challenges created by wild horse overpopulation, current management methods available to the BLM, and stakeholder attitudes towards management methods.

BLM lands are managed for multiple uses, such as recreation, mining, forestry, livestock grazing, and wildlife habitat (National Research Council, 2013). Wild horses are one of these multiple uses but limited socially acceptable management options and growing wild horse populations challenge the agency's ability to sustain both rangeland health and wild horse health and well-being. BLM Herd Management Areas (HMAs) are areas designated mainly for wild horses and burros and are to be "devoted principally but not exclusively to [wild horse] welfare in keeping with the multiple-use management concept of public lands" (National Research Council, 2013, p. 1). For each HMA, the BLM sets an Appropriate Management Level (AML), which is the number of wild horses that can properly thrive in an area without threatening other land uses. If the number of horses exceeds AMLs, the legislation allows the BLM to remove excess animals (National Research Council, 2013). Currently, the total high AML for the United

States is 26,770 animals. As of March 1, 2020, there were 79,568 wild horses and 15,546 wild

burros on BLM lands (Bureau of Land Management, 2018). Wild horse and burro populations

are exceeding AML by 68,344 animals (Bureau of Land Management, 2018). Furthermore,

populations have been estimated to increase at a rate of 15-20% per year (Garrott & Oli, A

critical crossroad for BLM's Wild Horse Program, 2013).

Wild horse population management has become imperative due to the extensive damage

wild horses are causing to rangeland ecosystems. Studies have shown that wild horse

overpopulation and overgrazing reduces total vegetation biomass (Baur et al., 2017), and

decreases species richness, continuous shrub canopy, grass cover, shrub cover, and total

vegetation cover (Beever, 2003; Beever et al., 2003; Beever et al., 2008). Sites overgrazed by

wild horses also showed higher vulnerability to invasive plant species (Beever et al., 2008;

Knapp, P. A. 1996). Trampling in sites overpopulated by wild horses increases soil compaction

(Beever & Herrick, 2006), decreases soil aggregate stability (Davies et al., 2014), increases water

runoff (Beever et al., 2008), and decreases ant mounds (Beever, 2003; Beever & Herrick, 2006).

Wild horse overpopulation negatively impacts populations of native wildlife species such as

reptiles (Beever & Brussard, 2004) and the threatened greater sage-grouse (*Centrocercus

urophasianus*) (Beever & Aldridge, 2011; Davies et al., 2014). Wild horses also outcompete

native ungulates (Coates & Schemnitz, 1994; Ostermann-Kelm et al., 2008; Perry et al., 2015;

Gooch et al., 2017) for resources, especially for water (Hall et al., 2016; Hall et al., 2018).

Overpopulation also leads to wild horse suffering in the form of disease, starvation, and

dehydration (National Research Council, 2013)

According to policy, the BLM is responsible for estimating the AML and maintaining

wild horses at or below this level to prevent further harm to rangeland ecosystems. When the

number of horses exceeds AML, BLM Employees have two main tools that they can use to reduce population numbers: fertility control or wild horse gather and removal (National Research Council, 2013). Fertility control can be administered on the range or off range. "Off-range" refers to off public rangelands or HMAs. The most common form of fertility control for wild horses is porcine zona pellucida (PZP), a two-year contraceptive administered to mares in the form of a vaccine (Turner et al., 2007). PZP is generally seen as humane due to its short-term duration and reversibility (Beever, 2003, Bartholow, 2007). However, it is not possible to control wild horse populations with fertility control alone for several reasons: treatments are short term (one to two years), every mare in a herd would have to be treated for it to be fully effective, and there is a timing component that can reduce the vaccine's effectiveness. Even if every mare were to be treated, it would take several years for wild horse populations begin to decrease (Fonner & Bohara, 2017).

The second alternative is "gather and removal", which is the primary management method the BLM uses to maintain AMLs (Ashley & Holcombe, 2001). Horses may be gathered on foot, on horseback, by vehicle, with the use of a helicopter, or using the "bait and trap" method (National Research Council, 2013). The bait and trap method consists of leaving "bait", which can be either food or water, in a corral, and trapping horses inside the corral after they enter. After horses are gathered, some of them are removed from the range to reach AML.

Horses that are removed are offered for adoption, sold, kept in permanent holding facilities, or, more recently, in privately owned pastures. Horses are removed for adoption in a specific order based on likelihood of adoption: horses 0-5 years old are removed first, then horses over 10 years old are removed, and finally horses 6 to 9 years old are removed (Bartholow, 2007). In March 2019, the BLM announced an adoption incentive in hopes of

increasing adoption rates (Bureau of Land Management, n.d.). The incentive allows qualified

adopters to receive up to $1,000 when adopting an untrained wild horse (BLM.gov). Wild horses

over 10 years old and younger horses that have been offered for adoption at least three times are

eligible for sale. This means that the horse is no longer owned by the federal government and is

owned by the buyer (Bureau of Land Management, n.d.). Policy does not permit sold horses to

be re-sold or sent to slaughter (Bureau of Land Management, n.d.). Horses that are not adopted

or sold are kept in permanent federal holding facilities indefinitely in order to reduce the number

of animals on public land (Bartholow, 2007). The BLM Wild and Free-Roaming Horse and

Burro Act states that animals for which there is no adoption demand are to be 'destroyed in the

most humane and cost-efficient manner possible.' However, because this is a controversial

action, it is not commonly used (National Research Council, 2013, p. 14).

In March 2020, another new initiative was announced for private landowners to house

wild horses on private "off-range" pastures (Bureau of Land Management, n.d.). Under this

program, the government financially compensates landowners willing to provide private off-

range pastures or off-range corrals to maintain non-reproducing herds of wild horses (Bureau of

Land Management, n.d.). Before the 2019 adoption incentive and the 2020 off-range funding

incentive, adoption rates were decreasing as horse populations continued to increase (de Seve &

Griffin, 2013).

Some possible population management methods are not legally permitted. Wild horses

cannot be sold neither by the BLM nor by the owners to other countries or for slaughter, even if

the horse was adopted or purchased (U.S. Congress, 1971). On the range, euthanasia is permitted

only under extreme circumstances (U.S. Congress, 1971).

Conflicting Attitudes towards Wild Horse Management

Since the passage of the Wild and Free Roaming Horse and Burro Act, wild horse management has become even increasingly complicated due to growing attention and involvement of different interest groups (Elizondo et al., 2016). In recent studies, Elizondo et al. (2016) identified two main interest groups involved: livestock producers on public lands and wild horse advocacy groups (Elizondo et al., 2016). According to Elizondo et al. (2016), livestock producers who hold grazing permits in HMAs shared with wild horses are concerned about decreasing availability of forage for their livestock and wild horse advocacy groups debate the BLM's wild horse population estimates, and often delay or prevent wild horse gathers with the intent to protect populations of wild horses. However, this conflict and the reasonings behind it are more complex in practice (Huffaker et al., 1990; Bastian et al., 1999; Elizondo et al., 2016). Previous studies on wild horse management suggest that wild horse conflict may be rooted in differences among groups' attitudes and how each group views the acceptability of different management methods (Rikoon & Albee, 1998; Rikoon, 2006; Nimmo & Miller, 2007). However, past studies have not considered the part that BLM Employees play in this conflict nor have they evaluated the conflict among these three main stakeholder groups. Furthermore, there have been no studies that evaluate and compare the possibly conflicting attitudes that these stakeholder groups have towards different management methods.

Wild horses and wild horse management have been studied by various disciplines including ecology, economics, politics, and other social sciences including folklore and anthropology. An emerging natural resource social science field is Human Dimensions of Wildlife, which integrates social science with human-wildlife relationships to improve wildlife management and conservation efforts by providing managers with information about public

values (Manfredo, 2008). This field, and the field of Human Dimensions of Natural Resources more broadly, have applied theories from social psychology to the study of human attitudes, values, and behaviors. Attitudes are the evaluation of an object and can involve an affective component, a cognitive component, or a conative component (Manfredo, 2008). The affective component refers to emotions towards an object, the cognitive component are beliefs about an object, and the conative component are behaviors related to an object (Manfredo, 2008). Attitudes influence behavior through a hierarchy of thoughts or cognitions known as the value–attitude–behavior (VAB) hierarchy (Manfredo et al., 1999; Manfredo, 2008). Stern et al. (1995) introduced this hierarchy to explain environmental concern and theorize that the factors of the hierarchy follow in the order of the diagram below.

Position within social structure

⬇

Values

⬇

General beliefs

⬇

Specific beliefs and attitudes

⬇

Behavioral commitments and intentions

⬇

Environmental behaviors
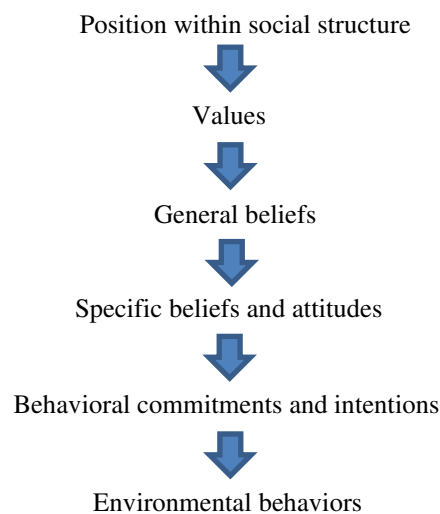
Figure 3.1. value–attitude–behavior (VAB) hierarchy
(Manfredo, 2008, p.151)

Applying the VAB theoretical framework and associated methods, studies of public attitudes towards wildlife and other natural resource issues are increasingly used to assess the social acceptability of specific management methods in natural resources. Attitude studies are widely prevalent for a few reasons. First, information on attitudes may be used to predict human

behavior. Second, understanding attitudes facilitates understanding and describing a group's

thoughts on specific objects or issues (Manfredo, 2008). Finally, people are self-aware of their

own attitudes and therefore able to express and report them, which may not be the case with

values (Manfredo, 2008). In summary, attitudinal studies using the VAB Framework have

addressed a broad spectrum of issues concerning natural resource management. However, most

such studies, including all of the studies mentioned in this section, use survey methods as their

only or main data collection method. A qualitative methodology could allow researchers to

obtain information beyond closed-ended survey questions provided in questionnaires. Further,

when the phenomenon at hand has not been studied, such as public attitudes towards wild horses

in the US West, qualitative open-ended inquiry is an essential prerequisite to development of

robust quantitative instruments such as surveys.

Few human dimension studies have focused on wild horses, fewer yet on U.S. wild

horses. No human dimensions studies have focused on BLM wild horse management. With

rising wild horse populations (Garrott & Oli, 2013), which are paralleled by rising conflict and

media attention (Elizondo et al., 2016), a human dimensions study on U.S. wild horses managed

by the BLM would contribute to understanding and potentially managing wild horse

management controversies in the US West. Such a study could provide BLM managers and other

decision-making groups with key information on the cultural values, attitudes, and views on

social acceptability of specific management methods held by three of the main groups involved

in wild horse management whose values and attitudes towards appropriate management appear

to conflict. This information could be highly valuable in making better wild horse management

decisions. Thus, the purpose of the propose of this study is to elicit and describe the attitudes of

BLM Permittees, BLM Employees, and Wild Horse Advocates towards current wild horse

population management methods.

Methods

Study Site

This study focuses on three Bureau of Land Management (BLM) Wild Horse

Management Areas (HMAs) in northwest Colorado: The Little Book Cliffs Wild Horse Area,

managed by the Grand Junction Field Office, the Piceance-East Douglas HMA, managed by the

White River BLM Field office, and the Sand Wash Basin HMA, managed by the Little Snake

BLM Field Office. Table 3.1 summarizes the characteristics of these three HMAs.

Table 3.1. Characteristics of the three Herd Management Areas (HMAs) in northwestern Colorado associated with this study (Source: (Bureau of Land Management, n.d.).).

HMA	Field Office	Location	Size	Topography and Dominant Vegetation	AML	Wild Horse Population in 2021
Little Book Cliffs Wild Horse Area	Grand Junction Field Office	Northeast of Grand Junction, CO	36,113 acres	Canyons and plateaus with pinyon-juniper.	90-150	146
Piceance-East Douglas Horse Management Area	White River Field Office	Southwest of Meeker, CO and east of State Highway 139.	190,130 acres	Rolling hills of pinyon-juniper and sagebrush steppe	135-235	838
Sand Wash Basin Horse Management Area	Little Snake Field Office	45 miles west of Craig, CO	157,730 acres	Ridges and mesas with sagebrush and bunchgrass, saltbush and pinon-juniper woodlands.	163-363	818

These three sites are managed by BLM Employees. BLM Permittees hold permits that

allow them to graze livestock on the land under specific guidelines determined by BLM

Employees; Importantly, at the time of this research some of these BLM Permittees had

voluntarily removed their livestock from the HMA temporarily in order to allow the land recover

from drought and grazing stress caused by wild horse overpopulation, livestock grazing, and

wildlife use. In these HMAs, Wild Horse Advocates work closely with BLM Employees as

volunteers, helping them keep record of horses on the HMAs, horse lineage, PZP administration,

HMA tours, and HMA range infrastructure maintenance.

Data Collection

Recruitment. I recruited 13 participants from three different stakeholder groups (BLM

permittees, BLM employees, and wild horse advocates) to take part in interviews. The three

BLM Permittees interviewed were associated with two HMAs, the seven BLM Employees were

associated with all three HMAs, and the three Wild Horse Advocates were associated mainly

with two HMAs, but some are involved in all three HMAs to some capacity. All the participants

in this study had to be associated with at least one of the three study HMAs to be considered.

For this study, I defined BLM Employees as federal government employees with direct

responsibility to manage wild horses or other resources within HMAs. Participants in the BLM

Employees group work or have worked in at least one of the three western Colorado HMAs.

BLM Permittees were livestock producers who hold or have held grazing permits within

an HMA or adjacent to an HMA. The latter were considered because they also tend to be

involved in wild horse issues. There are no BLM Permittees holding grazing permits in Little

Book Cliffs because it is a Wild Horse Area (HA) as opposed to an HMA, which means that

livestock grazing is not allowed, and wild horses are the primary focus of the HA.

I defined Wild Horse Advocates as members of a wild horse advocacy group based in

Colorado. I found four main Wild Horse Advocacy groups in northwestern Colorado: Friends of

the Mustangs, Piceance Mustangs, Wild Horse Warriors, and Sand Wash Advocacy Team (S.W.A.T.). Participants in the Wild Horse Advocates group are or have been members of at least one of these groups.

I identified the BLM managers of each BLM field office using information provided in the BLM website (Bureau of Land Management, n.d.) and personal referrals from key informants such as Colorado State University (CSU) faculty and Extension staff. The BLM managers and key informants directed us to other potential participants. I contacted potential participants directly via telephone (Appendix 2) or e-mail (Appendix 3) and invited them to participate in the study. All 13 participants were recruited through this process.

Interviews. I used a semi-structured interview protocol to guide interviews (see Appendix 1). Questions were centered on the participant's experience with wild horses, on how they value wild horses, and on their attitudes towards different wild horse management methods. Open ended questions regarding wild horse management allowed participants to contribute information on management methods known to them, while other structured questions were aimed to acquire information about specific management methods such as fertility control, gathers, and euthanasia. The research was conducted under CSU IRB Protocol #19-8518H and with free, prior, and informed consent. Interviews were audio-recorded with participants' consent.

Data Analysis

The audio-recorded interviews were professionally transcribed and crosschecked twice with the recordings for accuracy. After being reviewed twice for accuracy, transcriptions were considered ready for coding.

Coding. I generated priori codes for attitudes towards management methods by creating a list of wild horse management methods that are being used or that are suggested in books, journal articles, or websites. These management methods are: PZP, sterilization, bait and trap gather, ground gather, helicopter gather, removal for holding, removal for adoption, sale for use, sale for food, sale to other countries, and euthanasia. These methods include both the currently used methods described in the Introduction, as well as other methods that are not currently accepted by the public (sterilization, euthanasia) or that are not legally permitted (sale for slaughter or to other countries). Then, within each management method, I added a subcode for each attitudinal direction: negative or positive. To further classify participants' attitudes, I used "Values Coding" (Saldaña, 2009). This type of coding is applied to data that "reflect[s] a participant's values, attitudes, and beliefs" (Saldaña, 2009, p. 89). Values, attitudes, and beliefs may be alerted directly or indirectly with phrases such as "I like…" (Saldaña, 2009).

I first analyzed the 13 interviews for attitude statements about the management methods determined as priori codes. Then, I added other management methods that appeared during the interviews. I analyzed the interviews a second time and coded for the priori codes plus the codes that resulted from first analysis. Again, each management method had a subcode for each attitudinal direction: negative or positive. I read carefully and analyzed each group's "positive" and "negative" attitudinal statements. If most members of a group expressed that they "liked" a management method or that they thought it was effective in controlling wild horse populations, I determined that the overall group attitude towards the method was positive. If most members expressed "dislike" or that they thought a management method was not effective, I determined that the group overall held a negative attitude towards it. Attitudes were assessed by the proportion of each participant's interview that was spent talking about a specific management

method expressing either a negative or positive attitude, resulting in a percentage positive and percentage of negative attitudes expressed towards each method by each participant. Positive and negative attitudes toward each method were summed across all participants in each stakeholder group. For each method and stakeholder group, the attitude with the higher percentage was assigned as the dominant attitude within that group. For example, 0.67% of Wild Horse Advocate interviews were coded as expressing a positive attitude to Bait and Trap, and 1.41% was coded as expressing a negative attitude. Thus, I assigned an overall negative attitude towards Bait and Trap to Wild Horse Advocates. The participants in this study represent a small sample of the overall populations of Permittees, Employees and Wild Horse Advocates in the U.S. Thus, although the results may be accurate for these populations in northwestern Colorado, their attitudes do not represent all BLM Permittees, BLM Employees, or Wild Horse Advocates in the U.S.

Trustworthiness

The trustworthiness and qualitative rigor of this study were ensured by abiding to the standards set forth by Lincoln and Guba (1985). Credibility is the "internal validity" of the study. Guba suggests addressing credibility through prolonged engagement, persistent observation, peer debriefing, triangulation, referential adequacy materials, and member checks. The credibility of this study was addressed mainly by using referential adequacy materials and peer debriefing. Referential adequacy materials took the form of field notes, coding memos audio-recordings of the interviews, having the interviews professionally transcribed, and then reviewing the transcriptions twice for accuracy. These materials were triangulated with field notes taken before, during, and after each interview.

Transferability shows that the data collected is a representative sample of the general population. To address transferability, I sought stakeholders of all three HMAs in northwestern Colorado and selected three stakeholder groups that are present in most, if not all HMAs: BLM Permittees (or ranchers), BLM Employees, and Wild Horse Advocates. However, this was a small sample and generalizability is only for the possibility of conducting studies of the same nature to understand cultural values of wild horses held by stakeholder groups involved in wild horse management in HMAs.

Dependability indicates that a study is replicable. Dependability was addressed by designing an interview schedule that is applicable to all three stakeholder groups and coding these interviews in the same manner. This process was thoroughly described the methods section and in coding memos (Appendix 6).

Confirmability is the extent to which objectivity is placed on data itself rather than on the researcher. I addressed confirmability by providing general descriptions of the stakeholder groups or cultural groups, detailed quotes of their statements, and a description of the analysis process.

Results

After the first round of coding, I identified 14 main population management methods across the 13 interviews. I categorized these methods into in four groups:

- Gather methods: Bait and trap, ground gather, helicopter gather

- Fertility control methods: short-term, long-term, and permanent

- Removal methods: adoption, sale, holding, off-range pastures

- Other/unused methods: no action, on-range maintenance, hunting, euthanasia

In this section I briefly describe each stakeholder group's attitudes towards these four general categories of wild horse population management methods using illustrative interview excerpts.

BLM Permittees

The BLM Permittees interviewed spend countless hours working side by side with horses; to them wild horses are not too different from their own working ranch horses. When it comes to wild horse management, BLM Permittees prefer methods that are efficient and effective in avoiding rangeland degradation, but that also prevent wild horse suffering. BLM Permittees believed that if they had the ability to manage the horses as they manage their own livestock, they would be able to maintain healthy population numbers where neither the horses nor the land suffer. One BLM Permittee stated,

> "*The sad part is it's not really the horses that are the problem. It's the advocates and the managers, the Bureau of Land Management, and their inability to manage the wild horses, which have brought up experiences. I mean if the horses would have been managed properly from day one or if they would be, I don't think we'd have the problems we have today and both... Everyone could enjoy the horses and yet the natural resource would be in much better condition than it is today.*"

The permittee continued commenting on management by local ranchers prior to the act,

> "*There were horses there in [the HMA] that were basically managed by the people in the area as well as the ranchers, because originally the ranchers put them in there and they would control the genetics and the numbers, and they did a very good job of it until the Wild Horse and Burros Act in 1976.*"

Gather Methods: BLM Permittees held a mostly positive attitudes towards gathering as a population management method. Overall, they held a negative attitude towards bait and trap, and a positive attitude towards helicopter and ground gathers. One BLM Permittee stated that "*helicopter and men on horseback is the most efficient way to go.*" However, BLM Permittees

were not keen on the bait and trap gather method due to the expense; "*The trap, I think, and baiting the trap, does not work. It's very, very expensive, because that was tried in [the HMA] and I was told it's over a thousand dollars a horse.*"

Fertility Control Methods: BLM Permittees also held positive attitudes towards permanent fertility control. One of the BLM Permittees suggested, "*If they would castrate every stallion from baby colts all the way to the top there, then they wouldn't have to have another gather. They wouldn't have any increase there for four years.*" BLM Permittees held a negative attitude towards short-term fertility control, stating that they believed that it had not worked at the HMAs. They mentioned the possibility that there may be issues with dosage, frequency, or another part of the program. Additionally, they expressed concern for possible negative effects on mares and newborn foals, "*I think it's been a disaster. It's changed the estrus of the mare. You have mares foaling in the wintertime, and if they don't do the program properly, you can't control it.*" BLM Permittees did not talk about long-term fertility control.

Removal Methods: BLM Permittees held a positive attitude towards most removal methods. Overall, Permittees held positive negative towards adoption. One permittee believed that adoption was no longer an effective management method stating that, "*the problem is that they can't get enough people to adopt.*" Another BLM Permittee said, "*How many people are there that need a horse, you know, because some of those got dumped out there because somebody thought they needed a horse and then they didn't.*" However, BLM Permittees that had previously adopted wild horses mentioned that they were good horses. BLM Permittees held a negative attitude towards holding and viewed it as an unnecessary expense to taxpayers and a cruel practice: "*If you ever went to Nevada and went to the pens and looked at them, you'd understand why those horses would be better off if they were people food.*" Permittee attitudes

towards wild horse off-range pastures or sanctuaries were also negative. Although Permittees agreed that it was a good way to get the horses off the public lands, they mentioned that the off-range pastures or sanctuaries would also get to a point where they would have to reduce horse numbers. All BLM Permittees expressed positive attitudes towards selling excess wild horses. They agreed that selling wild horses for meat, especially to low-income communities, whether in the U.S. or other countries, was better than letting the horses suffer in overpopulated and degraded ranges. When speaking about this, one BLM Permittee added, "*It's not like I particularly enjoy thinking of horses going to a plant either."*

Other/unused Methods: "No action" was perceived as an undesirable management option by most BLM Permittees. On-range management/maintenance of wild horses also was received negatively by BLM Permittees. They expressed that maintaining wild horses on the range (i.e., providing water and emergency feed) is not equivalent to treating them like wildlife. As one BLM Permittee explained,

> "*In a hard winter or summer, they want to water the horses. They want to feed them. They want… I mean, they always advocate that they are wild horses, wild animals. But you know, they don't want to let them die and live the way like the elk, the deer, the rabbits, other wild animals, you know, live during these harsh environments.*"

BLM Permittees held negative attitudes towards hunting horses as a management method. When euthanasia was discussed, BLM Permittees initially stated that they did not have a problem with it. Overall, BLM Permittees held a positive attitude towards euthanasia. However, further conversation indicated that Permittees felt euthanasia should be reserved for 'extreme cases' to stop an animal from suffering. However, some BLM Permittees also suggested that declining rangeland conditions and resource scarcity during a drought also constituted an "extreme case," as the following quotation illustrates.

"*I think when you get to extreme cases, I think that needs to be looked at. I mean if you look historically at times, and you look at drought, or you look at... So, when you're looking at drought and they talk drought, they're looking at the resource. The resource that sustains the horses, and if the resource is not there... I mean we've got those options we talked about. One, they could either... Will people adopt them that can take care of them? Two, can we sell them in a marketplace where the meat can be sold? Three, you get to the three, to the extreme, where we're at the point where we have to euthanize. And it is very humane. I mean it's probably the most humane...Why do you want horses to go out there and starve? And you know they're going out there and starve and suffer? Well, that's crazy.*"

In sum, BLM Permittees' attitudes towards management methods were shaped by concern for both the land and wild horse welfare. This was borne out by their actions. For example, a few months before the interviews took place, when BLM Permittees noticed overgrazing in the HMA, they voluntarily reduced their livestock numbers. One permittee voluntarily and on their own initiative removed all their livestock from the HMA, according to BLM Employees interviewed.

BLM Employees:

Wild horses are one of the multiple resources that BLM Employees manage. They recognize that wild horses are feral animals, but rely on definitions in guiding legislation, saying, "*wild horse is the legal term*", and "*we call them what the law tells us to call them*". Regarding management, BLM Employees must balance what they believe to be the quickest and most effective method with its public acceptability. Rarely is one method fast, effective, and publicly acceptable, significantly complicating BLM Employee's jobs. One BLM Employee stated, "*You know, I kind of figure, if people on both sides are mad, I'm probably about where I need to be.*" Most of the BLM Employees expressed frustration at not being able to use all of the methods that the law allows, due to public attitudes. As one Employee stated, "*So that's what I advocate for, is having every tool in the toolbox available to manage those horses, because if we don't*

have every tool then we can't effectively manage, regardless of where it is." In management,

BLM Employees strive to preserve rangeland health while maintaining wild horse populations

within the appropriate AML.

      Gather Methods: BLM Employees held very mixed attitudes towards bait and trop, but

on balance attitudes were negative. On one gather occasion, when the bait and trap failed, the

BLM resorted to a helicopter gather, as one Employee described,

> "*[The bait and trap] went on for I think 45 days, and then we weren't able to catch, or at least reach, the horses that we were wanting to gather, and so we actually converted to a helicopter gather, and reached some more of those more difficult places that we couldn't bait trap.*"

      BLM Employees had a highly positive attitude towards helicopter gathers. "*You know,*

those pilots are amazing, how they get in behind those horses and just at a comfortable rate,

push those horses into the trap. Once they're in the trap, there's no difference between helicopter

assisted and bait trapping," one BLM Employee stated, "*They're a cowboy in the sky.*" They

mentioned that ground gathers, whether on horseback, motorized vehicle, or even on foot, are

dangerous for people and for the horses. However, they still held a positive attitude towards

ground gathers.

      Fertility Control Methods: BLM Employees held a positive attitude towards all fertility

control methods. Many of them mentioned permanent fertility control to bring population

numbers down for some time. One BLM Employee saw this as a way to make sure wild horses

could stay on the range, "*Where I see if spaying and gelding were utilized, I could see a horse*

getting to do 'born, live, die' on the range. By no means would we ever have a non-producing

herd." Most of them saw long-term fertility control as a great tool, but BLM has not approved its

use. They saw GonaCon as a great option. GonaCon is a longer-term fertility control option that

is used to control other ungulate wildlife populations. BLM Employees also held a positive

attitude towards short-term fertility control (PZP). Although they agreed that it is a great way of maintaining lower wild horse population numbers, they also agreed that PZP is not as effective in reducing horse numbers. In an HMA where wild horse numbers do not exceed the AML by much and the terrain makes it possible to find most of the mares, BLM Employees were grateful to have short-term fertility control and the help of the wild horse advocates/volunteers in administering PZP. One BLM Employee stated, "*The two things that we have proven to work here is PZP fertility control plus the use of volunteers to do positive things.*"

Removal Methods: BLM Employees' attitudes towards adoption were mostly positive. When asked about adoption, one BLM Employee responded, "*So far so good on that. I'm not sure. I don't think… it's obviously not the full answer because if it was the full answer, we wouldn't have 50,000 horses in holding.*" Many of the positive attitudes seemed to be because adoption was one of their best available tools. BLM Employees were also very grateful for wild horse advocacy groups that have helped them with the adoption program,

> "*[the wild horse advocacy groups] have been working really hard at finding adopters when they do hold an adoption so that none of the horses end up back in what they're calling the pipeline or end up in holding. To date they've been kind of successful. The last two adoptions they adopted everything.*"

BLM Employees held a negative attitude towards holding. Like BLM permittees, they viewed it as expensive and cruel. "*As a citizen, I actually think it's atrocious that we spend 50 million dollars a year on the long-term holding of animals like that,*" said one BLM Employee. On this same note, another employee said,

> "*If you have old animals that we cannot adopt, that just aren't getting adopted, rather than standing them up and feeding them, and them living out their old life… I think it's fair to the majority of the taxpayers to be humane and put those animals down humanely.*"

This is an option permitted by law, but not currently allowed by the BLM. In matters of animal welfare, another BLM Employee said,

> "*Method that I would consider being the worst? ...Warehousing horses is not a good method and that's where we're stuck right now just because of the history and how we've gotten here, and nobody's been able to find any solutions. But you know this is going to sound a little harsh but there's worst things than death. There is whether you're a human or an animal, there are worse things than death.*"

BLM Employees held a positive attitude towards off-range pastures. They also held a positive attitude towards sale of horses and although hesitant about it, they also held a positive attitude towards sale of horses for riding or meat, "*It's sad, right, and it should be, it rightly should be, and if it isn't, you're not human, I don't think you're... So, it is sad, but I am for a proper, good, humane use for those horses.*" All the BLM Employees that talked about this method made it very clear that they were only for it if it meant humane slaughtering.

Other/unused Methods: BLM Employees viewed the "no action" management option negatively. Nonetheless, some expressed that without being able to use the methods or tools that they need, that was what they were being forced to do. When asked about the worst management method they responded resentfully,

> "*Worst? Obviously the first one I mentioned, which is the natural equilibrium that dumb people think will happen. There is no such thing, it's the decimation of the range if there's zero resources and then everything dies, including the horses.*"

BLM Employees' attitude towards hunting was negative. One BLM Employee stated, "*And I can tell you this, that I don't know of one wild horse specialist that got into the wild horse program to shoot horses on the range. That's not why we're here.*" Their attitudes towards on-range horse management/maintenance were also negative,

> "*Okay so some people would believe that we would need to provide water, we would need to provide hay. We would need to not euthanize the horses in the field. But the fact of the matter is that something's askew there. The fact of the matter that if they're dying from those things their environment, their landscape, their resources are depleted.*"

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BLM Employees held a positive attitude towards euthanasia overall, although they said that they did not support euthanasia on a large scale and would only agree with it if it was necessary, *"I think euthanasia is your last option. I think there's other options that should be exhausted before you go to euthanasia."* Other than that, they only held a positive attitude for euthanasia if it was to stop an animal's suffering from injury or disease.

The attitudes held by BLM Employees were often very similar to those held by BLM Permittees, however they were also highly influenced by what they had learned is socially acceptable to the public. Because of this tension, their attitudes were somewhat a balance between those of BLM Permittees and Wild Horse Advocates.

Wild Horse Advocates

Wild Horse Advocates make weekly or monthly trips to the HMA where they spend hours, sometimes days, observing the wild horses from afar, much like wildlife. However, they also name the horses, keep records of their genealogy, and refer to them using possessive pronouns ("my horses," "our horses"). When considering management methods, Wild Horse Advocates preferred methods that allowed the wild horses to remain in the HMAs with minimal human intervention, except when the horses were suffering thirst or hunger. During long periods of drought, Wild Horse Advocates work together to supply water and feed to the horses on the HMA. They also preferred management methods that were centered around horse well-being.

Gather Methods: Wild Horse Advocates expressed that gathers were "cop outs" for poor management. Although initially they said that they preferred bait and trap, during the interviews they expressed mostly negative attitudes towards this method. They mentioned that bait and trap

put too much stress on the horses and that they did not think it was the most efficient method. *"I just don't know if it's truly the most efficient…I just don't know that it's economically and logically the most efficient way of doing it."* Some of these Advocates were present during the unsuccessful bait and trap effort, when BLM Employees decided to try a helicopter gather. The Wild Horse Advocates who experienced this situation had positive attitudes towards helicopter gathers, *"So you bring a helicopter in with the right person doing the helicopter and the right BLM personnel, I think you can have a safe, effective, less stressful, for a shorter period of time gather".* The Advocate who was not present stated that to them helicopter gathers were the worst method, but later in the interview they stated, *"They had helicopter pilots that were very conscious of the horses, so they didn't run them too much. They were very, very gentle with them."* Wild Horse Advocates held negative attitudes towards ground gathers.

Fertility Control Methods: When it came to permanent fertility control, one Wild Horse Advocate held a positive attitude towards treatment of mares, but a negative attitude towards treatment of stallions because they feared that stallion behavior would change. Another advocate was very supportive of this method, mentioning that they had observed "bachelor groups" of stallions that they think would be good candidates for treatment. This same advocate spoke of how treating mares could result in the mares living better lives, *"You know, we have too many horses. And if she becomes sterile, then she's probably not cycling and maybe the stallions will leave her alone and maybe she can actually have a healthier life."* Then, they added, *"I don't think that's bad. If that means that we don't have any more gathers and they get to live and die free and wild, I don't think that's a bad thing necessarily."* Overall, they held a positive attitude towards permanent fertility control. Wild Horse Advocates held positive attitudes towards long-term fertility control and one of them spoke specifically about the use of GonaCon. *"I think the*

new GonaCon that's coming on needs to be looked at and used and hopefully it will give us better results for longer periods of time." Advocates' attitudes towards short-term fertility control were mixed, but negative overall. The Wild Horse Advocates recognized that it was one of the best methods available. However, they all spoke of how PZP was not working well enough on the HMAs. *"We have several [mares] out there, I don't know exactly why the reason is, but we have several out there that have been shot, given the PZP every year and have foal every year."* Some of the Wild Horse Advocates suggested that this could be because PZP is not being administered correctly by the Wild Horse Advocate volunteers who responsible. They also suggested that some of the volunteers are picking which mares to shoot with PZP, when it is supposed to be random,

> "*And they won't come in and say, 'No, I'm not darting her because she is beautiful.' They have to come in and just dart every female horse that's out here. Mare, filly, granny. Every one of them has to be darted. We had 20-year-olds foaling last year, and they hadn't been being darted because they didn't think they'd foal again."*

Another advocate also said, *"I don't like people playing God and picking which mares to shoot… When they're doing the PZP, I think it kind of should be random. It's not random up here. There's a group gets together, and I don't know."* Like the BLM Permittees, the Wild Horse Advocates also noticed that PZP had negative effects on the behavior of wild horses, *"PZP has probably increased the stallion fighting, and it's increased the number of times a mare is actually bred.*"

Removal Methods: Wild Horse Advocates work to get any horses that are removed from the HMA adopted. They held a positive attitude towards adoption. Wild Horse Advocates held a negative attitude towards holding, especially of horses with no hope of being adopted. The advocates held mixed, but mostly negative attitudes towards sale. One of the advocates held a very strong negative attitude towards it because they believed that "*other countries want to take*

their meat. Slaughter them, feed it to their animals." The same advocate held a very strong

negative attitude towards horses being sold for meat, stating that eating horse meat violates a

Christian religious prohibition. "*This is a Christian country. That is not something that*

Christians do, that's in the Bible." However, other advocates did not view this option as

negatively, "*Sometimes I think we ... there's a lot of meat there. I just don't know. You know*

what, maybe we do need to put some down. It's kind of like… To do something with the many to

save the few," one advocate said, "*I'm not going to judge them one way, or the other if they feel*

the need to do something with them horses that normally wouldn't be kosher. If we want to save

the ranges, something needs, maybe some tough decisions need to be made. I'm not going to

make them." Another Wild Horse Advocate had a similar position, but about removal in general,

> "*You have to remove some. We look at it as some lose their freedom for others to remain free. And it's a tough concept and it's a tough conversation. But we cannot continue on our own HMA to grow the way we're growing, or we're going to run into that, and we will have animals that are starving to death or can't get to the water or the fighting over the feed. It just becomes too much."*

Wild Horse Advocates held positive attitudes towards off-range management or

sanctuaries.

Other Methods: Like the other two stakeholder groups, the majority of Wild Horse

Advocates held a negative attitude towards the "no action" method. When asked what they

thought the worst method was, one advocate stated, "*Doing nothing. I mean that's the only other*

one that I've really heard very much about, it's either PZP or nothing." However, one Wild

Horse Advocate did not have a problem with "no action." When asked what they would do if

vegetation and wildlife were to disappear because of damage caused by wild horse population,

they responded, "*assume that was part of the evolution and not worry about it."* Wild Horse

Advocates held a positive attitude toward on-range management/maintenance, stating because

the horses are fenced in the HMAs, this is necessary. "*This BLM works really hard to help take care of these horses. Sometimes people try to stop that. It's like that's not natural. Just let ... well, come on. They're fenced in.*" Wild Horse Advocates held a negative attitude towards hunting. One Wild Horse Advocate said,

> "*Horses are a single hoof, they're not the split hoof, so we're not supposed to eat them. We're not supposed to do that. We have to figure out another way to maintain it. If you kill something, you're taking its life. And the only reason something should die is to help something else live.*"

Wild Horse Advocates' attitudes towards euthanasia were mixed but negative on balance. Like the other stakeholder groups, Wild Horse Advocates viewed euthanasia negatively as a population control method, "*to maintain the population, absolutely not. That's a piss-poor excuse.*" Another advocate stated, "*Not on the range. I don't like that. Mother nature takes care of my horses.*" However, they held a positive attitude towards euthanasia when used to stop an animal's suffering. "*As far as if an animal is injured, it needs to be euthanized. If it's uncomfortable, if it's in pain, then it needs to be euthanized, just like we do for our pets.*" One of the Wild Horse Advocates stated that they believed euthanasia should be a method used on the horses in holding that have low probabilities of being adopted.

> "*I do think that there are a lot of wild horses in holding that should be euthanized. I think they have no chances of being adopted. I think there's a lot of them that can never really find a home that will work for them. Those that were taken off the range and they've got club feet or knees that are bad or whatever, they'll never find a home. Their spirit has already been broken. And it's costing $45-50,000 a year for every wild horse in holding, even those that have no chance of ever being removed from holding. That's really not fair to those wild horses that are on the range that need that money to be able to survive on the range.*"

The attitudes towards euthanasia held by Wild Horse Advocates were rooted in their desire to prevent the wild horses from suffering and to make sure that the horses remained in the HMAs from their birth until their deaths.

The results of this study illustrate that attitudes towards management methods differ among groups, within groups, and sometimes even individuals expressed having contradicting attitudes. Generally, participants in each group held similar attitudes. Table 3.2 summarizes the attitudes held by the three stakeholder groups towards each management method.

Table 3.2. Stakeholder attitudes towards management methods. Colors of squares under the groups (columns) represent the attitude held towards management methods (rows). Red represents negative attitudes and green represents positive attitudes. Blank cells represent that the group did not express an attitude towards management method.

Type of Method	Method	BLM Permittees	BLM Employees	Wild Horse Advocates
Gather	Bait and trap	(Red)	(Red)	(Red)
	Ground	(Green)	(Green)	(Red)
	Helicopter	(Green)	(Green)	(Green)
Fertility Control	Short-term	(Red)	(Green)	(Red)
	Long-term	(Blank)	(Green)	(Green)
	Permanent	(Green)	(Green)	(Green)
Removal	Adoption	(Red)	(Green)	(Green)
	Sale	(Green)	(Green)	(Red)
	Holding	(Red)	(Green)	(Red)
	Off-range pastures	(Red)	(Green)	(Green)
Other	No Action	(Red)	(Red)	(Green)
	On-range maintenance	(Red)	(Red)	(Green)
	Hunting	(Red)	(Red)	(Red)
	Euthanasia	(Green)	(Green)	(Red)

Discussion

I found that the three stakeholder groups shared similar attitudes about various methods (Table 3.2). All three groups shared positive attitudes towards helicopter gather and permanent fertility control. Also, they all shared negative attitudes towards bait and trap, holding, and hunting. Although their attitudes did not completely align on euthanasia, all three groups found it acceptable under extreme circumstances.

Table 3.3. Stakeholder groups' main management concerns and attitudes towards specific management methods.

Group	Main Concerns	Type of Method	Preferred	Acceptable, Not Preferred	Least Preferred
BLM Permittees	• Land health • Horse health • Horse welfare • Taxpayer cost	Gather	Helicopter, ground		Bait and trap
		Fertility Control	Permanent		Short-term
		Removal	Sale		Adoption, holding, off-range pastures
		Other		Euthanasia	No action, on-range maintenance, hunting
BLM Employees	• Land health • Horse welfare • Legality of method • Social acceptability of method • Taxpayer cost	Gather	Helicopter	Bait and trap, ground	
		Fertility Control	Permanent, long-term	Short-term	
		Removal	Adoption, sale	Off-range pastures	Holding
		Other		On-range maintenance, euthanasia	No action, hunting
Wild Horse Advocates	• Horse welfare • Horse "wildness" (minimal human interference)	Gather	Helicopter	Bait and trap	Ground gather
		Fertility Control	Permanent, long-term	Short-term	
		Removal		Adoption, sale	Holding
		Other	On-range maintenance	No action, euthanasia	Hunting

The main differences among groups were in which management methods they preferred and what their main concerns were when choosing a method. Table 3.3 summarizes the key differences in the three stakeholder groups revealed through the interviews with respect to their main concerns related to wild horse management and the management methods they find most and least acceptable.

Stakeholders' agreement on helicopter gathers and permanent fertility control suggests that these could be viable management options in northwestern Colorado that could garner broad support and de-escalate public conflict. For example, helicopter gathers have been done recently and the three groups commented that they were quick, safe for the horses, and cost effective. In

the past, Wild Horse Advocates often opposed helicopter gathers. However, the Wild Horse Advocates I interviewed experienced and were part of a failed bait and trap attempt that led to a successful helicopter gather. Their firsthand experience witnessing both methods seemed to affect their perspectives, as they found that helicopter gathers were faster, less expensive, and less stressful for the horses. This instance of stakeholder engagement (i.e. involving Wild Horse Advocates in a BLM gather) leading to attitude change offers an example of how inclusion of different stakeholder groups, working and testing out management methods together can transform previously controversial management methods into viable socially acceptable methods. This situation was specific to northwestern Colorado, however. Future studies could learn from this site about how BLM Employees and Wild Horse Advocates were able to begin working together, how this joint work continues, and its longer-term influence on inter-group dynamics and attitudes towards acceptable management. Given the acceptability of permanent fertility control by all stakeholder groups in my study, engaging stakeholders in the process of testing this method in northwestern Colorado could be a reasonable next step.

Surprisingly, all three groups agreed that euthanasia was acceptable, though not preferred. The mention of euthanasia often led to strong reactions and lengthy discussions. None of the participants interviewed accepted euthanasia as a method to control populations on a large scale, even if they did accept it as a humane way to end a horse's suffering. Members of all three stakeholder groups also understood that the land in the HMAs is harmed by overuse due to uncontrolled horse populations. BLM Permittees had voluntarily removed their livestock from the HMA to let it recover, BLM Employees were trying to find ways to decrease grazing pressure, and some Wild Horse Advocates noticed that forage was becoming scarce and had resorted to providing water for the horses during periods of drought. BLM Permittees and BLM

Employees mentioned that they would find euthanasia acceptable only in extreme cases, some mentioning the resource depleted HMAs that they had seen in Nevada as examples. A few participants seemed to believe that their HMA could get to that point if something was not done differently soon. One of the least preferred management methods by all three groups was holding. They considered this method cruel and, in some cases, even worse than euthanasia.

Stakeholder attitudes towards some methods did differ substantially. Regarding ground gathers, adoption, and on-range maintenance, each group expressed a different attitude. BLM Permittees opposed adoption and on-range maintenance and Wild Horse Advocates favored them, and BLM Employees found adoption and on-range maintenance acceptable, though not preferred (Table 4). BLM Permittees and Advocates face the most conflict.

Stakeholders' differing attitudes towards ground gathers may be related to their different life experiences. BLM Permittees often gather their livestock using on-ground methods and some lived in a time when wild horses were gathered the same way. Therefore, to BLM Permittees, on-ground gathers seem like a good option. However, BLM Employees perceive on-ground gathers as dangerous. While some of the BLM Employees have experience herding livestock, this is not true for all employees. Also, compared to helicopter gathers, on-ground gathers are much less efficient and effective. As mentioned in the interviews, helicopter gathers are also less stressful on the horses if done correctly and due to their efficiency, they can be more cost-effective. Further research is needed to understand how the different life experiences of the three groups affects their perceptions of wild horses and attitudes towards wild horse management methods.

Conclusion and Implications

In conclusion, interviewees from all three stakeholder groups recognized that wild horse overpopulation is a problem that affects both land health and animal welfare. BLM Permittees would like wild horse populations to be controlled to return the land and wild horses to a healthy state. Improved range conditions would also let them reintroduce some of their livestock into the HMA. BLM Employees saw wild horse populations increasing and believed that none of their available methods was effective in controlling them. Wild Horse Advocates wanted the BLM Employees to control the populations to prevent removing wild horses from the HMA. Although their main concerns varied, all groups shared one concern: horse welfare. None of the three groups wants to see the wild horses suffer. All three stakeholder groups agreed that holding is not acceptable, and the worst management method currently being used. These groups are actively seeking the best management methods available and considering those that are not available yet. This study illuminates each stakeholder group's attitudes towards the acceptability of specific management practices, and how they are shaped by their interactions with horses and other stakeholders. These insights hold practical implications for understanding and managing conflict over wild horse management in northwestern Colorado and beyond. First, understanding stakeholders' management concerns and attitudes has potential to transform seemingly "irrational" attitudes into understandable views. Further, this information could inform negotiation among groups by helping participants to focus on interests or main concerns (e.g. wild horse welfare) rather than positions (e.g. opposition to helicopter gathers) (Fisher et al., 1981). It may also help them to see their shared concerns/interests, and to better understand where and why their interests differ, laying the groundwork for greater mutual respect among stakeholder groups. Clear identification of management concerns also creates more transparent

criteria against which to compare and ultimately rank different management options. Finally, data from this study revealed how engaging stakeholders, like Wild Horse Advocates, in collaborative efforts to manage wild horses provides them with firsthand experiences that can change their attitudes about specific management methods (e.g. helicopter gathers). Thus, although this study is exploratory and geographically specific, it suggests how such qualitative study of the human dimensions of wild horse management can potentially identify pathways for more constructive dialog, communication, and collaboration among stakeholders.

Building on these insights, future research could include more qualitative interviews in other BLM HMA sites across the West, followed by broad-scale surveys to obtain a more broad and generalizable understanding of attitudes towards wild horse management methods and their acceptability across the country. Such a survey could also further test my initial theoretical claims about the relationship between how different stakeholder groups understand wild horses, their main management concerns, and the acceptability of different management methods. Although past work presents general ideas about public attitudes towards wild horse management methods, there is very little scientific data on attitudes of different stakeholder groups, and none focusing on the entire United States (Nimmo, Miller, 2007; Nimmo et al., 2007; National Research Council, 2013). If public attitudes and social acceptability influence which management methods are used, further research is essential to understand which management methods are most and least acceptable, by whom and why, especially now, when wild horse policy is dynamically evolving.

CHAPTER 4 – CONCLUSION AND IMPLICATIONS

The purpose of this thesis was to attempt to understand some of the conflict between BLM Permittees, BLM Employees, and Wild Horse Advocates regarding wild horse population management. Although this conflict has fueled many scientific studies about wild horses, few studies seek to document or understand the root of this conflict. This is with good reason. The conflict is complex and plays out among different individuals, at different scales, in different mediums, and in specific geographical locations. This study focuses on thirteen participants from three HMAs in northwestern Colorado. Drawing on human dimensions of natural resources theory on values and attitudes, and prior research on wild horse management conflicts, this thesis addressed the following objectives. 1) Identify and describe the cultural values that the three main stakeholder or cultural groups associate with wild horses, 2) explore similarities and differences in the values attributed to wild horses by the three stakeholder groups, and how they might contribute to conflict, and 3) elicit and describe the attitudes of BLM Permittees, BLM Employees, and Wild Horse Advocates towards current wild horse population management methods. The overall goal of the study was to better understand the roots of conflict among different stakeholder groups with respect to wild horse population management.

In chapter two, I focused on the first two questions, which relate to cultural values. I proposed that BLM Permittees, BLM Employees, and Wild Horse Advocates may be understood as different cultural groups, as defined by Barnes (1986) and Bhattacharyya et al. (2011). I expected the groups to hold different cultural values. I found that in northwestern Colorado, interviewed stakeholders attributed eight main values to wild horses: aesthetic, educational, genetic, historical, memory/identity, social, spiritual, and utilitarian. Although most of these

values were shared among members of all three stakeholder groups, the groups differed in how strongly they hold each value. As described in Chapter 2, Permittees have lived and worked alongside wild horses their entire lives--some worked with wild horses since before the Wild and Free Roaming Horse and Burro Act was signed—and most have owned and trained wild horses. Therefore, Permittees strongly attributed memory/identity and utilitarian values to wild horses. Wild Horse Advocates believed that wild horses are not the same as domesticated horses, but often related them to domesticated horses. They also believed that wild horses in northwestern Colorado are descendants of the first horses introduced to America by Spanish conquistadores. Thus, Wild Horse Advocates strongly attributed genetic value to wild horses. Wild Horse Advocates enjoy observing and photographing wild horses on the HMA. They often find themselves in social groups brought together by advocacy, photography, and their common appreciation for wild horses. Wild horse advocates thus attribute aesthetic and social values to wild horses. Wild Horse Advocates were the only cultural group that held spiritual value for wild horses. Understanding cultural values could offer BLM officials a tool to understand the stakeholders that they work with, what they value, and how these values may influence acceptability of management options. For example, because both BLM Permittees and Wild Horse Advocates attributed a strong utilitarian value and a moderate historical value to wild horses, justifying management decisions based on these values may help make them acceptable to both groups. However, if BLM relies on historical value in this way, it would be important for the three groups to work with a historian to write a well-documented history of the wild horses in the area. Additionally, all three groups attributed aesthetic, educational, genetic and memory/identity values to horses, though with varying strength. Some of these values could also

allow for finding management methods and making management decisions that are acceptable to all three groups, especially if the reasons behind these differences are understood.

Chapter Three encompasses the two research objectives regarding attitudes towards wild horse management methods. I elicited stakeholder attitudes towards 14 population management methods and found that BLM Permittees, BLM Employees, and Wild Horse Advocates held the same attitudes towards several key management methods. All groups supported helicopter gathers and permanent fertility control and were willing to accept euthanasia to end horse suffering. All opposed holding and hunting. This analysis offered a greater understanding of the underlying reasons for conflict about wild horse management methods, as well as specific attitudes held by different stakeholders. This understanding, in turn, could support more constructive negotiations among groups by revealing shared values and attitudes, and helping identify clear criteria for management decisions grounded in stakeholders' management concerns (i.e., interests) rather than positions (Fisher and Ury, 1991).

This thesis is one of the first studies to investigate the root of conflict about wild horse management on BLM land in the US West. Previous studies (Bhattacharyya & Larson, 2014; Bhattacharyya & Murphy, 2015; Bhattacharyya et al., 2011; Rikoon J., 2006; Rikoon & Albee, 1998) suggested that differences in cultural values and attitudes could contribute to the conflict, yet I found that the explanation is not so simple. Cultural values attributed to wild horses and attitudes towards management methods did not differ substantially among the three stakeholder groups observed. Rather, the main difference appeared in the suite of cultural values and their relative strengths held by each group. In addition, the three stakeholder groups shared attitudes towards important management methods including positive attitudes towards helicopter gathers and permanent fertility control, acceptability of euthanasia in extreme circumstances, and

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negative attitudes towards holding. My qualitative approach using semi-structured interviews was key to gaining these insights, which lay the groundwork for future survey research.

This study is based on a small sample of stakeholders from a specific region— northwestern Colorado. Thus, my findings may not represent all BLM Permittees, BLM Employees, or Wild Horse Advocates in northwestern Colorado or in other regions of the U.S. West. However, exploring cultural values helped identify what was important to each stakeholder group. In this way, I was able to determine which values and attitudes were shared among stakeholder groups and which were not. Further, the investigation of values, and insights about how each group understands wild horses, led us to posit an explanation for why their attitudes towards management differ. These insights about shared and divergent values and attitudes have practical implications for managing wild horses and related conflicts in northwestern Colorado.

First, understanding cultural values attributed to wild horses by different stakeholder groups, and how these value sets vary among groups lays a foundation for understanding differing attitudes towards specific management practices. Understanding shared values, such as utilitarian and historical value of wild horses, could help the BLM managers craft rationales for wild horse policies that are grounded in these widely shared values. Second, understanding shared concerns (e.g. wild horse welfare) and attitudes (e.g. support for helicopter gathers and permanent fertility control, and opposition to holding), and how differing attitudes are grounded in differing concerns, could support more constructive interest-based (in contrast to position-oriented) negotiations among stakeholder groups. Third and finally, my interviews revealed how engagement of stakeholders in management activities could alter their attitudes towards specific

methods (i.e. when Wild Horse Advocates changed views about helicopter gathers after participating in a failed bait and trap effort followed by a successful helicopter gather).

In northwestern Colorado, inclusion and communication play important roles in improving relationships among stakeholder groups and overcoming potential stereotypes they may hold about each other. In this region, BLM Employees invite Wild Horse Advocates to attend and participate in range monitoring events, wild horse gathers, and management decision-making meetings. In turn, Wild Horse Advocates help BLM Employees with wild horse gathers, PZP administration, adoption events, wild horse tracking, and wild horse records. BLM Employees also work very closely with BLM Permittees. The largest disconnect appears to be between Wild Horse Advocates and BLM Permittees. Inclusion and communication between these two groups could be beneficial in reducing conflict. For example, Wild Horse Advocates expressed negative and mistaken views about BLM Permittees and were unaware that BLM Permittees voluntarily removed their livestock from the HMA to allow the land to recover. Likewise, BLM Permittees appeared unaware that Wild Horse Advocates actively assist BLM with wild horse gathers and adoptions. As my data show, members of all three groups had more similarities than differences in both cultural values attributed to wild horses and attitudes towards management methods. Thus, my findings could provide a starting point towards future conversations regarding wild horse management in northwestern Colorado.

Our findings also suggest directions for future research on the human dimensions of wild horses and wild horse conflict in the western US. My small, regionally specific qualitative study led us to theorize that stakeholder conflict over wild horse management stems from differing conceptions of and values attributed to wild horses by different stakeholder groups, leading to different management concerns or interests, and in some cases, differing management

preferences. This theory must be further developed and tested on a larger population across other regions where wild horses are managed on BLM lands. Following my approach, I recommend additional region-specific qualitative studies to further verify or expand upon my findings. This qualitative work could be followed by a broad-scale structured survey to determine the extent to which each stakeholder group (and potentially the general public) attribute different values to horses and hold different attitudes towards specific management measures. Such a survey could also be used to test my theory. Finally, my observations about the role of stakeholder engagement in changing attitudes and my hypotheses about improving stakeholder relationships suggest that it could be valuable to carry out studies to assess the effectiveness of stakeholder engagement and multi-stakeholder communication and collaboration related to wild horse management on mitigating conflict and identifying mutually acceptable management pathways.

Many ecological studies have been conducted on wild horses, wild horse management, and wild horse overpopulation and its effects. However, social science studies on wild horse management, including conflict between stakeholders about wild horse management, remain rare. While people continue to disagree, rangelands and wild horses suffer the consequences of delayed management. Understanding the human dimensions of wild horse management is crucial not only to alleviating conflict, but also to identifying management decisions that work for each HMA, address the concerns of stakeholders, and are in the best interest of wild horses and healthy rangelands.

References

Ashley, M. C., & Holcombe, D. W. (2001). Effect of stress induced by gathers and removals on reproductive success of feral horses. *Wildlife Society Bulletin*(29), 248-254.

Avrami, E., Mason, R., & de la Torre, M. (2000). *Values and heritage conservation.* Los Angeles: The Getty Conservation Institute.

Barnes, S. H. (1986). *Politics and culture. .* Ann Arbor: Institute for Social Research.

Bartholow, J. (2007). Economic benefit of fertility control in wild horse populations. *Journal of Wildlife Management*(71), 2811-2819.

Bastian, C. T., Van Tassell, L. W., Cotton, A. C., & Smith, M. A. (1999). Opportunity costs related to feral horses: A Wyoming case study. *Journal of Range Management*(52), 104-112.

Baur, L. E., Schoenecker, K. A., & Smith, M. D. (2017). Effects of feral horse herds on rangeland plant communities across a precipitation gradient. *Western North American Naturalist*(77), 526-539.

Beever, E. (2003). Management implications of the ecology of free-roaming horses in semi-arid ecosystems of the western United States. *Wildlife Society Bulletin*(31), 887-895.

Beever, E. A., & Aldridge, C. L. (2011). Influences of free-roaming equids on sagebrush ecosystems, with a focus on greater sage-grouse. *Berkeley: University of California Press*, 273-290.

Beever, E. A., & Brussard, P. F. (2004). Community- and landscape-level responses of reptiles and small mammals to feral-horse grazing in the Great Basin. *Journal of Arid Environments*(59), 271-297.

Beever, E. A., & Herrick, J. E. (2006). Effects of feral horses in Great Basin landscapes on soils and ants: Direct and indirect mechanisms. *Journal of Arid Environments*(66), 96-112.

Beever, E. A.; Tausch, R. J.; Thogmartin, W. E. (2008). Multi-scale responses of vegetation to removal of horse grazing from Great Basin (USA) mountain ranges. *Plant Ecology*(196), 163-184.

Beever, E., Tausch, R., & Brussard, P. F. (2003). Characterizing grazing disturbance in semiarid ecosystems across broad scales, using diverse indices. *Ecological Applications*(13), 119-136.

Bhattacharyya, J., & Larson, B. M. (2014). The need for indigenous voices in discourse about introduced species: Insights from a controversy over wild horses. *Environmental Values*(23), 663-684.

Bhattacharyya, J., & Murphy, S. D. (2015). Assessing the role of free-roaming horses in a social-ecological system. *Environmental Management*(56), 433-446.

Bhattacharyya, J., Slocombe, D. S., & Murphy, S. D. (2011). The "wild" or "feral" distraction: Effects of cultural understandings on management controversy over free-ranging horses (Equus ferus caballus). *Human Ecology*(39), 613-625.

Boyd, C. S., Davies, K. W., & Collins, G. H. (2017). Impacts of feral horse use on herbaceous riparian vegetation within a sagebrush steppe ecosystem. *Rangeland Ecology & Management*(70), 411-417.

Browne-Nuñez, C., & Vaske, J. (2006). Predicting unsure responses to a proposed moose hunt in Anchorage, Alaska. *Human Dimensions of Wildlife*(11), 371-382.

Brunson, M. (1993). "Socially acceptable" Forestry: What does it imply for ecosystem management? *Western Journal of Applied Forestry*(8(4)), 116–119.

Brunson, M. (1996). A definition of "social acceptability" in ecosystem management. Paper presented at the defining social acceptability in ecosystem management: A workshop proceedings, general technical report PNW-GTR-369.

Brunson, M. S. (2004). Geographic variation in social acceptability of wildland fuels management in the western United States. *Society & Natural Resources*(17(8)), 661-678.

Bruskotter, J., Vaske, J., & Schmidt, R. (2009). Social and cognitive correlates of Utah residents' acceptance of the lethal control of wolves. *Human Dimensions of Wildlife*(14(2)), 119-132.

Brydon, M., & Vining, A. R. (2016). Combining citizen participation and expert analysis: A wild, wild horses problem in British Columbia. *Local Government Studies*(42), 75-96.

Bureau of Land Management. (2018). *Herd area and herd management area statistics*. Retrieved from Bureau of Land Management: https://www.blm.gov/sites/blm.gov/files/wildhorse_programdata_2018hmastats.pdf

Bureau of Land Management. (n.d.). *Wild Horse and Burro*. Retrieved from Bureau of Land Management: http://www.blm.gov/wo/st/en/prog/whbprogram.html

Caplenor, C. A., Poudyal, N. C., Muller, L. I., & Yoest, C. (2017). Assessing landowners' attitudes toward wild hogs and support for control options. *Journal of Environmental Management*(201), 45-51.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis (Introducing qualitative methods).* Thousand Oaks, CA, United States of America: Sage Publications.

Coates, K. P., & Schemnitz, S. D. (1994). Habitat use and behavior of male mountain sheep in foraging associations with wild horses. *Great Basin Naturalist*(54), 86-90.

Collins, G. H., & Kasbohm, J. W. (2017). Population dynamics and fertility control of feral horses. *Journal of Wildlife Management*(81), 289-296.

Collins, G. H., & Kasbohm, J. W. (n.d.). Population dynamics and fertility control of feral horses. *Journal of Wildlife Management*(81), 289-296.

Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five approaches. .* Thousand Oaks: Sage Publications.

Cruise, D., & Griffiths, A. (2010). *Wild Horse Annie and the last of the mustangs.* New York, New York, United States of America: Scribner.

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

Davies, K. W., Collins, G., & Boyd, C. S. (n.d.). Effects of feral free-roaming horses on semi-arid rangeland ecosystems: an example from the sagebrush steppe. *Ecosphere*(5), 14.

de Seve, C. W., & Griffin, S. L. (2013). An economic model demonstrating the long-term cost benefits of incorporating fertility control into wild horse (equus caballus) management programs on public lands in the United States. *Journal of Zoo and Wildlife Medicine*(44), 34-37.

Dietz, T., & Stern, P. (1998). Science, values, and biodiversity. *BioScience*(48(6)), 441-444.

Eberhardt, L. L., Majorowicz, A. K., & Wilcox, J. A. (1982). Apparent rates of increase for two feral horse herds. *The Journal of Wildlife Management*(46(2)), 367-374.

Elizondo, V., Fitzgerald, T., & Rucker, R. R. (2016). You can't drag them away: An economic analysis of the Wild Horse and Burro Program. *Journal of Agricultural and Resource Economics*(41), 1-24.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research.* Reading, Massachusetts, United States of America: Addison-Wesley.

Fisher, R., Ury, W., & Patton, B. (1981). *Getting to yes: Negotiating agreement without giving in* (2nd ed.). New York, New York, United States of America: Penguin.

Fonner, R., & Bohara, A. K. (2017). Optimal Control of Wild Horse Populations with Nonlethal Methods. *Land Economics*(93), 390-412.

Fulton, D. C., Manfredo, M. J., & Lipscomb, J. (1996). Wildlife value orientations: A conceptual and measurement approach. *Human Dimensions of Wildlife*(1(2)), 24–47.

Garrott, R. A., & Oli, M. K. (2013). A critical crossroad for BLM's Wild Horse Program. *Science*(341), 847-848.

Garrott, R. A., Siniff, D. B., & Eberhardt, L. L. (1991). Growth rates of feral horse populations. *The Journal of Wildlife Management*(55(4)), 641-648.

Glesne, C., & Peshkin, A. (1998). *Becoming qualitative researchers: An introduction.* White Plains, New York, United States of America: Longman.

Gooch, A. M., Petersen, S. L., Collins, G. H., Smith, T. S., McMillan, B. R., & Eggett, D. L. (2017). The impact of feral horses on pronghorn behavior at water sources. *Journal of Arid Environments*(138), 38-43.

Grayson, K. D. (1993). *The desert's past: A natural history of the Great Basin.* Washington D.C., United States of America: Smithsonian Institution Press.

Hall, L. K., Larsen, R. T., Knight, R. N., & McMillan, B. R. (2018). Feral horses influence both spatial and temporal patterns of water use by native ungulates in a semi-arid environment. *Ecosphere*(9), 15.

Hall, L. K., Larsen, R. T., Knight, R. N., & McMillan, B. R. (2018). Feral horses influence both spatial and temporal patterns of water use by native ungulates in a semi-arid environment. *Ecosphere*(9), 15.

Hall, L. K., Larsen, R. T., Westover, M. D., Day, C. C., Knight, R. N., & McMillan, B. R. (2016). Influence of exotic horses on the use of water by communities of native wildlife in a semi-arid environment. *Journal of Arid Environments*(127), 100-105.

Hampton, J. O., Edwards, G. P., Cowled, B. D., Forsyth, D. M., Hyndman, T. H., Perry, A. L., . . . Collins, T. (2017). Assessment of animal welfare for helicopter shooting of feral horses. *Wildlife Research*(44), 97-105.

Hampton, J. O., Robertson, H., Adams, P. J., Hyndman, T. H., & Collins, T. (2016). An animal welfare assessment framework for helicopter darting: a case study with a newly developed method for feral horses. *Wildlife Research*(43), 429-437.

Harper, E., Miller, C., Vaske, J., Mengak, M., & Bruno, S. (2016). Stakeholder attitudes and beliefs toward wild pigs in Georgia and Illinois. *Wildlife Society Bulletin*(40(2)), 269-273.

Huffaker, R., Wilen, J., & Gardner, B. (1990). A bioeconomic livestock/wild horse trade-off mechanism for conserving public rangeland vegetation. *Western Journal of Agricultural Economics*(15), 73-82.

Jacobs, M., Vaske, J., Dubois, S., & Fehres, P. (2014). More than fear: Role of emotions in acceptability of lethal control of wolves. *European Journal of Wildlife Research*(60(4)), 589-598.

Kania, A. (2012). *Wild Horse Annie: Velma Johnston and her fight to save the mustang.* Reno: University of Nevada Press.

Kellert, S. R. (1976). Perceptions of animals in American society. *Transactions of North American Wildlife and Natural Resources Conference*(41), 533–546.

Kiley, H. M., Ainsworth, G., van Dongen, W. F., & Weston, M. A. (2017). Variation in public perceptions and attitudes towards terrestrial ecosystems. *Science of the Total Environment, *, 590-591, 440-451.

Knapp, P. A. (1996). Cheatgrass (Bromus tectorum L) dominance in the Great Basin Desert - History, persistence, and influences to human activities. *Global Environmental Change-Human and Policy Dimensions*(6), 37-52.

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry.* Sage Publications.

Linklater, W. L., Stafford, K. J., Minot, E. O., & Cameron, E. Z. (2002). Researching feral horse ecology and behavior: turning political debate into opportunity. *Wildlife Society Bulletin*(30), 644-650.

Lloyd, K., & Miller, C. (2010). Factors related to preferences for trap–neuter–release management of feral cats among Illinois homeowners. *Journal of Wildlife Management*(74), 160-165.

Manfredo, M. (2008). *Who Cares About Wildlife?* New York, New York, United States of America: Springer U.S.

Manfredo, M., Pierce, C., Fulton, D., Pate, J., & Gill, B. (1999). Public acceptance of wildlife trapping in Colorado. *Wildlife Society Bulletin*(27(2)), 499-508.

Menard, C., Duncan, P., Fleurance, G., Georges, J., & Lila, M. (2002). Comparative foraging and nutrition of horses and cattle in European wetlands. *The Journal of Applied Ecology*(39(1)), 120-133.

Moon, K., & Blackman, D. (2014). A guide to understanding social science research for natural scientists. *Conservation Biology*(28(5)), 1167-1177.

Moon, K., Brewer, T., Januchowski-Hartley, S., A. V., & Blackman, D. (2016). A guideline to improve qualitative social science publishing in ecology and conservation journals. *Ecology and Society*(21(3)).

Morton, L., Regen, E., Engle, D., Miller, J., & Harr, R. N. (2010). Perceptions of landowners concerning conservation, grazing, fire, and eastern redcedar management in tallgrass prairie. *Rangeland Ecology & Management*(63(6)), 645-654.

National Research Council. (2013). *Using science to improve the BLM Wild Horse and Burro Program: A way forward. .* National Academies Press.

Nimmo, D. G., & Miller, K. K. (2007). Ecological and human dimensions of management of feral horses in Australia: a review. *Wildlife Research*(34), 408-417.

Nimmo, D. G., Miller, K. K., & Adams, R. (2007). Managing feral horses in Victoria: A study of community attitudes and perceptions. *Ecological Management & Restoration*(8:), 237–243.

Ostermann-Kelm, S., Atwill, E. R., Rubin, E. S., Jorgensen, M. C., & Boyce, W. M. (2008). Interactions between feral horses and desert bighorn sheep at water. *Journal of Mammalogy*(89), 459-466.

Oxford English Dictionary 2nd Ed. (1989). *2nd*, Oxford English Dictionary.

Perry, N. D., Morey, P., & San Miguel, G. (2015). Dominance of a natural water source by feral horses. *Southwestern Naturalist*(60), 390-U162.

Poudyal, N. C., Bowker, J., & Moore, R. L. (2016). Understanding public knowledge and attitudes toward controlling hemlock woolly adelgid on public forests. *Journal of Forestry*(114(6)), 619-628.

Reed, C. M. (2012). Enriching the lives of wild horses: Designing opportunities for them to flourish. *Environmental Values*(21), 317-329.

Rikoon, J. (1996). Imagined culture and cultural imaging: Cultural implications of the USDA-SCS "Harmony"; campaign. *Society and Natural Resources*(9(6)), 583-593.

Rikoon, J. (2006). Wild horses and the political ecology of nature restoration in the Missouri Ozarks. *Geoforum*(37), 200-211.

Rikoon, J., & Albee, R. (1998). 'Wild-and-free,-leave-'em-be': Wild horses and the struggle over nature in the Missouri Ozarks. *Journal of Folklore Research*(35), 203-222.

Saldaña, J. (2009). *The coding manual for qualitative researchers.* Los Angeles, California, United States of America: SAGE Publications.

Scasta, J. D., Beck, J. L., & Angwin, C. J. (2016). Meta-analysis of diet composition and potential conflict of wild horses with livestock and wild ungulates on western rangelands of North America. *Rangeland Ecology & Management*(69), 310-318.

Sijtsma, M. T., Vaske, J. J., & Jacobs, M. H. (2012). Acceptability of lethal control of wildlife that damage agriculture in the Netherlands. *Society & Natural Resources*(25), 1308-1323.

Sponarski, C. C., Vaske, J. J., & Bath, A. J. (2015). Differences in management action acceptability for coyotes in a national park. *Wildlife Society Bulletin*(39), 239-247.

Sponarski, C., Vaske, J. J., & Bath, A. J. (2015). Attitudinal differences among residents, park staff, and visitors toward coyotes in Cape Breton Highlands National Park of Canada. *Society & Natural Resources*(28(7)), 1-13.

Stephenson, J. (2008). The cultural values model: An integrated approach to values in landscapes. *Landscape and Urban Planning*(84), 127-139.

Stephenson, J. (2016). Conflict in the landscape: A case study of the Cultural Values Model. *Public History Review, 13*.

Stern, P. C., Dietz, T., & Guagnano, G. A. (1995). The new environmental paradigm in social-psychological context. *Environment and Behavior*(27(6)), 723–743.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Newsbury Park, California, United States of America: SAGE.

Symanski, R. (1994). Contested realities: Feral horses in outback Australia. *Annals of the Association of American Geographers*(84(2)), 251-269.

Symanski, R. (1996). Dances with horses: Lessons from the environmental fringe. *Conservation Biology*(10(3)), 708-712.

The Cloud Foundation. (2018). Retrieved January 2019, from The Cloud Foundation: https://www.thecloudfoundation.org/

Turner, J. W., Liu, I. K., Flanagan, D. R., Rutberg, A. T., & Kirkpatrick, J. F. (2007). Immunocontraception in Wild Horses: One Inoculation Provides Two Years of Infertility. *The Journal of Wildlife Management*(71(2)), 662–667.

U.S. Congress. (1971). *Administration of [public law] 92-195, Wild and Free Roaming Horse and Burro Act.*

Vaske, J. (2008). *Survey research and analysis: Applications in parks, recreation and human dimensions.* State College, Pennsylvania, United States of America: Venture Publishing.

Vaske, J., & Donnelly, M. (1999). A value-attitude-behavior model predicting wildland preservation voting intentions. *Society & Natural Resources*(12(6)), 523-537.

Wehr, P. E. (1979). *Conflict regulation.* Boulder, Colorado: Westview Press.

Young, J., & Sparks, B. (2002). *Cattle in the cold desert.* Reno, Nevada, United States of America: University of Nevada Press.

Zabala, A., Sandbrook, C., & Mukherjee, N. (2018). When and how to use Q methodology to understand perspectives in conservation research. *Conservation Biology*(32(5)), 1185-1194.

Zinn, H. C., Manfredo, M. J., Vaske, J. J., & Wittmann, K. (1998). Using normative beliefs to determine the acceptability of wildlife management actions. *Society & Natural Resources*(11), 649-662.

Zivin, J., Hueth, B., & Zilberman, D. (2000). Managing a multiple-use resource: The case of feral pig management in California rangeland. *Journal of Environmental Economics and Management*(39), 189-204.

APPENDICES

Interview Schedule
Cultural Values and Social Acceptability of Wild Horse Management Methods
Introduction
As I mentioned when we went over the consent form just now, the purpose of this interview is to learn more about the values of wild horses and the attitudes and acceptability towards different wild horse management methods from the perspective of a(n) (BLM employee/ BLM permittee/ advocate for wild horse protection). Would you like to proceed?
The interview should take about 45-60 minutes. Are you able to respond to the questions at this time? Do you have any questions before we begin?
Background
To start, I'd like to ask a few questions about your background.
1. Please you tell me where and when you were born.
2. Did you grow up on a farm or ranch, in town, a suburb, or in a big city?
3. How long have you lived in Colorado?
4. Tell me a little about your schooling.
   a. [Prompt if needed] What's the highest level of education you completed?
   b. [If college or higher] What was your major?
5. Do you identify as a(n) (BLM employee/ BLM permittee/ advocate for wild horse protection)?
6. How long have you been doing this?
7. a) For permittees: Tell me a little about your operation. What type of livestock do you run? How long have you had permits/been grazing within/near the HMA?
   b) For BLM staff: Tell me a little about your job responsibilities and how they relate to wild horse management.
   c) For wild horse advocates: Tell me a little about your organization and its activities related to wild horse protection.
8. Do you have other jobs or other careers/occupations in the past?
9. Which Herd Management Area (HMA) are you most involved with?
10. Have you been involved with other HMAs? [If so] Which ones?
Values of Wild Horses
[Transition] Great. Now let's talk a little bit about wild horses.
11. Do you usually call them wild horses or do you prefer to call them something else (Eg. feral horses, free-roaming horses, mustangs, unwanted horses, etc.)?
12. When did you first become aware of/learn about wild horses?
13. How do you usually learn about wild horses or obtain new information about them?
14. What information source do you consider the most reliable when it comes to wild horses [or preferred term]?
15. Could you tell me a little bit about your experience with wild horses [or preferred term]?
16. Why are wild horses [or preferred term] important to you?
17. Do you think they would be important in another way if you were not a(n) (BLM employee/ BLM permittee/ advocate for wild horse protection)?

18. How do you think others feel about wild horses? Why do you think they hold these views?
   - (prompt) For example, how do you think BLM employees/permittees/advocated think about wild horses?

Attitudes Towards and Acceptability of Wild Horse Management Methods

19. Which wild horse [or preferred term] herd management methods are you aware of?
20. Which wild horse [or preferred term] management method do you consider the best overall? Why?
21. Which wild horse [or preferred term] management method do you consider the worst overall? Why?
22. Which wild horse [or preferred term] management method do you consider the most effective in controlling wild horse [or preferred term] populations?
23. What criteria or considerations do you consider most important when choosing between management methods?

[Transition] Now I am going to ask you some questions about specific wild horse management methods.

24. BLM uses fertility control treatments in the form of PZP as one of their main methods. They also use wild horse [or preferred term] gathers and removals. If they remove horses, these horses go to the Wild Horse and Burro Adoption Program or to temporary holding facilities. What is your opinion on these methods?
25. Do you think that the wild horse management methods being used by the BLM could be improved? How?
26. What do you think of wild horse [or preferred term] removal from BLM lands as a method to control wild horse [or preferred term] population numbers?

27. Which wild horse gather method do you think is **best**: foot/horseback, on-ground motorized vehicle, or helicopter? Why?
28. Which wild horse gather method do you think is **worst**: foot/horseback, on-ground motorized vehicle, or helicopter? Why?
29. When wild horses [or preferred term] are removed from BLM lands, do you think it would be better for them to be sold through the BLM Wild Horse and Burro Adoption Program, through an independent program other than the BLM Wild Horse and Burro Adoption Program, or that they stay in holding facilities permanently? Why?
30. What do you think of wild horses [or preferred term] removed from BLM lands being sold to buyers from other countries?
31. What type of fertility control option do you think is best? Permanent invasive (such as surgery), permanent non-invasive, or short-term non-invasive? Why?
32. What do you think about euthanasia as a method to control wild horse [or preferred term] population numbers?
33. [If yes] Which method of euthanasia, do you consider the best option? Why?
34. Recently in Australia, wild horse [or preferred term] populations exceeded 400,000 animals. Then, Australia was struck with drought. Government agencies felt forced to shooting horses. Now, management methods in Australia include ground-shooting, and helicopter shooting. There, these methods are considered as the most practical and humane management method for wild horse [or preferred term] population control. What is your opinion on this?

35. Earlier in this interview you mentioned that you consider _____ to be the most reliable source for information on wild horses. The next questions I am going to ask you will be a little different. I am going to tell you about different made-up or partially made-up cases involving wild horses [or preferred term]. Then, I will ask you questions about management methods related to each case. There will be four cases. Does that sound okay?

36. For the first case, [reliable source] confirmed that wild horse [or preferred term] trampling was having a negative impact on a very sensitive plant. Many insects, small mammals, large mammals, and even livestock rely heavily on this plant for survival. After a few weeks, you learn from the news the plant has been classified as an endangered species. [Reliable source] then confirm(s) that reducing the number of horses could save this endangered species.
    a. Which would you consider a better option: PZP use or permanent fertility control? Why?
    b. Would you consider euthanasia an acceptable option? Why or why not?

37. For the second case, [reliable source] confirmed that wild horse [or preferred term] trampling was having a negative impact on a mammal that needs underground burrows for survival. Then, the mammal is classified as an endangered species. [Reliable source] also confirm(s) that reducing the number of horses could save this endangered species.
    a. Which would you consider a better option: PZP use or permanent fertility control? Why?
    b. Would you consider euthanasia an acceptable option? Why or why not?

38. For the third case, [reliable source] confirmed that wild horse [or preferred term] overpopulation was having a negative impact on wild horses [or preferred term]. Wild horses are suffering hunger, thirst, and disease. [Reliable source] also confirm(s) that reducing the number of horses could improve the condition of wild horse well-being.
    a. Which would you consider a better option: PZP use or permanent fertility control? Why?
    b. Would you consider euthanasia an acceptable option? Why or why not?

39. For the fourth and final case, [reliable source] confirmed that wild horse [or preferred term] overpopulation was having a negative effect on BLM rangelands. The situation is so grave, that every BLM permittees is being forced to remove their livestock from every single HMA. A few BLM permittees can relocate their livestock to other areas, but most are forced to sell and quit their jobs. Some of them have been livestock producers their entire lives and will have a hard time finding a new job. [Reliable source] also confirm(s) that reducing the number of horses could help improve rangeland conditions and allow BLM permittees to keep their livestock in HMAs.
    a. Which would you consider a better option: PZP use or permanent fertility control? Why or why not?
    b. Would you consider euthanasia an acceptable option? Why or why not?

Conclusion
40. That is the end of my questions. Is there anything you would like to add?
41. Do you have any questions for me?
If I need clarification on any of your responses, would it be okay if I contact you?
Thank you (Mr./Mrs./Ms.) _____. Your contribution is incredibly valuable for this study.
If you have any questions, please feel free to contact me. Have a good day.

Telephone Recruitment Script
Cultural Values and Social Acceptability of Wild Horse Management Methods

➢ Good (morning/afternoon/evening). May I speak with (Mr./Mrs./Ms.) _____?

➢ Hello (Mr./Mrs./Ms.) _____. My name is Elena Dosamantes. I am a graduate student from Colorado State University in the Department of Forest & Rangeland Stewardship. I am working on a research study on people's values and attitudes towards wild horses and the acceptability of different wild horse management methods. The title of the project is "Cultural Values and Social Acceptability of Wild Horse Management Methods". I learned from (website/key informant) that you are a(n) (BLM employee/ BLM permittee/ advocate for wild horse protection) and that you have experience with wild horses and wild horse management.

➢ I am calling because I am very interested in learning about your experience and would like to invite you to participate in an interview regarding your experience with wild horses and wild horse management. Participation would take about 45-60 minutes. We could meet at a time and place that is convenient for you. Would you like to participate?

> **If Yes:**
> o Great, thank you. Your participation will be very valuable to this study. When and where would you be able to meet for the interview?
> o Perfect, see you at (time and place). Would you like me to give you my telephone number or email address?
> o Thank you again, I hope you have a good (day/night).

> **If No:**
> o Okay, I understand. If you change your mind or have any questions about the study, please call me. Would you like me to give you my telephone number or email address?
> o Thank you for your time, I hope you have a good (day/night).

APPENDIX 3 – E-MAIL RECRUITMENT SCRIPT

Email Recruitment Script
Cultural Values and Social Acceptability of Wild Horse Management Methods

Dear (Mr./Mrs./Ms.) _____,

My name is Elena G. Dosamantes and I am a graduate student from Colorado State University in the Department of Forest & Rangeland Stewardship. We are conducting a research study on people's values and attitudes towards wild horses and the acceptability of different wild horse management methods. The title of the project is "Cultural Values and Social Acceptability of Wild Horse Management Methods". I learned from (website/key informant) that you are a(n) (BLM employee/ BLM permittee/ advocate for wild horse protection) and that you have experience related to wild horses and wild horse management.

I would like to invite you to participate in an interview to share your experience with wild horses and wild horse management with us. Participation would take about 45-60 minutes, and we can meet at the time and location of your choice. If you agree to participate, please respond to this email and let me know what is a good time for you to talk.

If you decide to participate in the study, we will keep your name and identifying information confidential. When we report and share the data with others in reports or research publications, we will combine the data from all participants so that no individual can be identified. Participation is voluntary and there are no direct benefits to you. However, your contribution would help us to gain more knowledge about how different stakeholder groups value wild horses and their views on the acceptability of different management methods. This information may be helpful in informing future policy and decision-making.

If you have any questions about the research, please contact Elena G. Dosamantes at elenagdm@colostate.edu or 520-338-7470 or Dr. María E. Fernández-Giménez at maria.fernandez-gimenez@colostate.edu or 970-491-0409. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

Elena G. Dosamantes
MS Student in Rangeland Ecosystem Science
Dept. of Forest & Rangeland Stewardship
Colorado State University

Table.4.0. Values coding table for BLM Permittees (BLMP), BLM Employees (BLME), and Wild Horse Advocates (WHA).

Value and Description	Participant	Percent	Group	Percent by Group
1. Aesthetic Value: Coded when participants referenced the beauty of the horses themselves, as well as the aesthetics of the horses interacting with other horses and their environment.	BLMP1	0.34%		
	BLMP2	0.00%		
	BLMP3	0.00%	BLMP	0.11%
	BLME1	0.50%		
	BLME2	0.14%		
	BLME3	1.09%		
	BLME4	0.82%		
	BLME5	0.00%		
	BLME6	0.00%		
	BLME7	0.00%	BLME	0.36%
	WHA1	2.94%		
	WHA2	0.14%		
	WHA3	2.18%	WHA	1.75%
2. Educational Value: Coded when participants mentioned learning or teaching something in a situation where a horse was part of the process.	BLMP1	0.00%		
	BLMP2	2.88%		
	BLMP3	0.00%	BLMP	0.96%
	BLME1	2.91%		
	BLME2	0.00%		
	BLME3	0.00%		
	BLME4	0.00%		
	BLME5	0.00%		
	BLME6	0.50%		
	BLME7	0.00%	BLME	0.49%
	WHA1	0.00%		
	WHA2	0.00%		
	WHA3	0.90%	WHA	0.30%
3. Genetic Value: Coded when participants commented on the origin of the horses, their ancestry or descendants, their breed, coloring, and overall physical appearance.	BLMP1	1.42%		
	BLMP2	2.16%		
	BLMP3	0.00%	BLMP	1.19%
	BLME1	2.40%		
	BLME2	0.00%		
	BLME3	0.00%		
	BLME4	0.29%	BLME	0.87%

	BLME5	3.42%		
	BLME6	0.00%		
	BLME7	0.00%		
	WHA1	0.70%		
	WHA2	3.02%		
	WHA3	2.29%	WHA	2.00%
4. Historical Value: Coded when participants spoke of the history of wild horses.	BLMP1	0.34%		
	BLMP2	3.60%		
	BLMP3	0.00%	BLMP	1.31%
	BLME1	0.00%		
	BLME2	1.80%		
	BLME3	1.54%		
	BLME4	0.54%		
	BLME5	0.00%		
	BLME6	0.00%		
	BLME7	2.73%	BLME	0.94%
	WHA1	3.87%		
	WHA2	1.98%		
	WHA3	0.00%	WHA	1.95%
5. Memory/Identity Value: Coded when participants mentioned memories or stories of memories related to wild horses that expressed value towards the horses.	BLMP1	0.00%		
	BLMP2	10.48%		
	BLMP3	0.00%	BLMP	3.49%
	BLME1	2.50%		
	BLME2	1.77%		
	BLME3	0.84%		
	BLME4	0.00%		
	BLME5	3.83%		
	BLME6	3.05%		
	BLME7	2.37%	BLME	2.05%
	WHA1	0.00%		
	WHA2	0.18%		
	WHA3	0.93%	WHA	0.37%
6. Social Value: Coded when participants expressed a valued social benefit that happened because of involvement with wild horses.	BLMP1	0.00%		
	BLMP2	0.00%		
	BLMP3	0.00%	BLMP	0.00%
	BLME1	0.00%		
	BLME2	0.00%		
	BLME3	1.11%		
	BLME4	0.00%		
	BLME5	0.99%	BLME	0.30%

	BLME6	0.00%		
	BLME7	0.00%		
	WHA1	0.71%		
	WHA2	0.89%		
	WHA3	3.72%	WHA	1.77%
7. Spiritual Value: Coded when participants mentioned spirituality as related to wild horses.	BLMP1	0.00%		
	BLMP2	0.00%		
	BLMP3	0.00%	BLMP	0.00%
	BLME1	0.00%		
	BLME2	0.00%		
	BLME3	0.00%		
	BLME4	0.00%		
	BLME5	0.00%		
	BLME6	0.00%		
	BLME7	0.00%	BLME	0.00%
	WHA1	1.52%		
	WHA2	5.06%		
	WHA3	0.00%	WHA	2.19%
8. Utilitarian Value: Coded when a horse was valued for its "use". Three types of utilitarian values were identified- economic value, value as resources, and value as riding animals	BLMP1	4.42%		
	BLMP2	7.34%		
	BLMP3	9.18%	BLMP	6.98%
	BLME1	0.00%		
	BLME2	0.64%		
	BLME3	1.72%		
	BLME4	2.24%		
	BLME5	1.95%		
	BLME6	1.52%		
	BLME7	2.86%	BLME	1.56%
	WHA1	0.00%		
	WHA2	0.00%		
	WHA3	10.45%	WHA	3.48%

Table.5.0. Attitudes towards management methods coding table for BLM Permittees (BLMP), BLM Employees (BLME), and Wild Horse Advocates (WHA).

		Method	BLMP 1	BLMP 2	BLMP 3	BLMP Total	Method	BLME 1	BLME 2
Gather methods	Positive	Bait and trap	0%	0%	0%	0%	Bait and trap	0%	0.14%
	Negative		0.78%	0%	0%	0.78%		1.91%	0.77%
	Positive	Ground gather	0.33%	1.54%	0%	1.87%	Ground gather	0%	0%
	Negative		0%	0%	0%	0.00%		0%	0%
	Positive	Helicopter gather	2.29%	0.11%	0%	2.40%	Helicopter gather	1.45%	3.71%
	Negative		0%	0.24%	0%	0.24%		0%	0%
Fertility control methods	Positive	Short-term	0.63%	0%	0%	0.63%	Short-term	1.63%	0%
	Negative		0.98%	2.51%	2.87%	6.36%		0%	0.50%
	Positive	Long-term	0%	0%	0%	0.00%	Long-term	1.33%	0%
	Negative		0%	0%		0.00%		0%	0%
	Positive	Permanent	0.40%	1.98%	0.79%	3.17%	Permanent	0%	0.92%
	Negative		0%	0%	0%	0.00%		0%	0%
Removal methods	Positive	Adoption	0.53%	0%	0%	0.53%	Adoption	5.66%	0.16%
	Negative		4.49%	0.13%	0%	4.62%		0%	0%
	Positive	Holding	0%	0%	0%	0.00%	Holding	0%	0%
	Negative		0%	0.80%	0%	0.80%		0.62%	0.38%
	Positive	Off-range pastures	0%	0%	0%	0.00%	Off-range pastures	0%	0%
	Negative		2.24%	0%	0%	2.24%		0%	0%
	Positive	Sale	4.92%	5.62%	2.69%	13.23%	Sale	1.29%	0.22%
	Negative		0%	0%	0%	0.00%		0%	0%
	Positive	Euthanasia	5.75%	0.85%	0%	6.60%	Euthanasia	0.39%	1.66%
	Negative		0%	1.48%	2.69%	4.17%		0.69%	0.40%
Other methods	Positive	Hunting	0%	0%	0%	0.00%	Hunting	0%	0%
	Negative		0%	1.55%	0.66%	2.21%		0%	0%
	Positive	No action	0%	0%	0%	0.00%	No action	0%	0%
	Negative		0.64%	0.28%	0%	0.92%		0%	0.07%
	Positive	On-range maintenance	0%	0%	0%	0.00%	On-range maintenance	0%	0%
	Negative		0%	0.36%	2.65%	3.01%		0%	0%

BLME 3	BLME 4	BLME 5	BLME 6	BLME 7	BLME Total	Method	WHA 1	WHA 2	WHA 3	WHA Total
0%	0%	0%	1.52%	1.85%	3.51%	Bait and trap	0.08%	0.45%	0.14%	0.67%
0%	0.93%	0%	0%	0%	4%		0%	1.18%	0.23%	1%
0%	0%	0.54%	0%	0%	1%	Ground gather	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%		0%	0.67%	0.44%	1%
2.69%	2.53%	1.74%	1.13%	5.65%	19%	Helicopter gather	0.26%	1.61%	3.16%	5.03%
0%	0%	0%	0%	0%	0%		0.42%	0.18%	0%	0.60%
1.65%	1.70%	1.82%	2.64%	1.22%	11%	Short-term	0.78%	0.16%	0.52%	1.46%
0%	1.65%	0%	0%	3.67%	6%		1.26%	4.44%	1.09%	6.79%
0.61%	1.65%	0%	0%	1.37%	5%	Long-term	0.69%	0.54%	0.07%	1.30%
0%	0%	0%	0%	0%	0%		0%	0%	0%	0.00%
0%	2.74%	0%	0%	0.52%	4%	Permanent	1.49%	4.75%	0%	6.24%
0%	0%	0%	0%	0%	0%		0.28%	0%	0%	0.28%
0%	9.91%	0.42%	0.94%	0.44%	18%	Adoption	0%	0%	8.98%	9%
0%	1.86%	0%	2.24%	0%	4%		0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	Holding	0%	0%	0%	0%
3.19%	2.28%	1.18%	2.76%	0%	10%		0%	0.30%	0.25%	1%
0%	0%	0%	0%	1.27%	1%	Off-range pastures	0.47%	0%	0%	0.47%
0%	0%	0%	0%	0%	0%		0%	0%	0%	0%
0.51%	2.49%	2.62%	2.69%	1.74%	12%	Sale	0.18%	0.89%	0.31%	1.38%
0%	0%	0%	0.97%	0%	1%		1.19%	0%	0.56%	1.75%
0.04%	3.47%	5.69%	3.20%	0%	14%	Euthanasia	0.47%	1.92%	1.96%	4.35%
1.31%	0%	0.38%	0.61%	0.63%	4%		1.16%	0.67%	3.73%	5.56%
0.46%	0%	0%	0%	0%	0%	Hunting	0%	0%	0%	0%
0%	0%	0.66	0%	0%	66%		0.99%	0.58%	0%	1.57%
0%	0%	0%	0%	0%	0%	No action	2.63%	0%	0.29%	2.92%
0%	0%	1.11%	1.60%	0.73%	4%		0%	0.24%	0.14%	0.38%
0%	0%	0%	0%	0%	0%	On-range maintenance	1.92%	0%	0.08%	2.00%
0%	2.52%	0%	0%	0%	3%		0%	0%	0%	0%

MEMO 1 - Background and Research Questions

Cultural Values
"A brief explanation of the use of the term 'culture', 'value' and 'cultural values' in this context is necessary. Current interpretations propose that culture is a dynamic process whereby people are actively engaged in constructing group life and its products (Johnston et al., 2000). Thrift and Whatmore (2004) suggest that 'culture' is used today in three main (but overlap- ping) ways—in an anthropological sense as the whole way of life of a people; as a functional means of ascribing identity to a group; and to refer to particular social processes (p. 7–8). People are considered to live culturally rather than in cultures, with the generative source of culture being human practices rather than in representations of the world (Ingold, 1994). These dynamic senses of 'culture' are adopted here.

The concept of 'value', once considered an intrinsic and universal state, is now generally considered to be a social construction arising from the cultural contexts of a time and place (Avrami et al., 2000). Brown et al. (2002) suggest that people hold certain 'values' but also express 'value' for certain objects. In this sense, understanding how a landscape is valued involves understanding both the nature of the valued 'object' (or aspect of landscape), and the nature of the expressed value/s for that object. These values do not speak for themselves: they can only be identified when they are expressed by those who are part of the cultural context, or by those who are able to observe and understand.

Arising from the evolving meanings of 'culture' and 'values', cultural values are taken to be those values that are shared by a group or community or are given legitimacy through a socially accepted way of assigning value. This suggests that there can be multiple ways of valuing landscapes—values shared by those within an associated group as well as those attributed by disciplinary 'experts. In the sense it is used here, 'cultural values' are inclusive not only of attributes traditionally considered to be part of 'culture' such as stories and myths, but also of attributes that might be considered to be part of 'nature' yet which are valued culturally—an example in New Zealand being the high value placed by society on 'natural' landscapes such as native forests and undeveloped coastlines (Peart, 2004)."
(Stephenson, 2008)

"In the Bhattacharyya et al. study culture is defined as "a set of beliefs and assumptions developed by a given group in its effort to cope with the problems of external adaptation and internal integration" (Barnes, 1986; Bhattacharyya et al., 2011, p. 617). Values can be defined as a noun or as a verb; as a noun values are "a stable, meaning-producing super-ordinate cognitive structure (Rohan, 2000, p. 257; Manfredo, 2008, p. 142), and as a verb values are "people's assignment of meaning, goodness, or worth" (Manfredo, 2008, p. 142) onto an object."

Acceptability
"Attitudes are the evaluation of an object and can involve an affective component, a cognitive component, or a conative component (Manfredo, 2008). The first are emotions towards an object, the second are beliefs about an object, and the third are behaviors related to an object (Manfredo, 2008)."

Attitudes
Brunson (1996) defines "social acceptability" as an attitudinal orientation towards specific natural resource conditions or practices and may lead to behavior (Brunson, 1996). If a condition or practice is acceptable, behavior to change this will not be initiated, but if condition or practice is unacceptable then behavior to change or stop this may be elicited (Brunson, 1996).

MEMO 2 – Priori Codes

Cultural Values:
1) Forms ("The term forms has been adopted to capture this first group of aspects, as a term that is consciously inclusive of both natural and cultural features (Stephenson, 2008).")
2) Practices ("The third component – practices – is inclusive of both human practices and natural processes (there does not appear to be a word in the English language that captures both concepts) (Stephenson, 2008).")
3) Relationships ("The term relationships is proposed to encompass those generated by people–people interactions in the landscape, those generated by people–landscape interac- tions, and valued relationships within the landscape even where there is little or no direct human involvement (e.g., ecological relationships) Stephenson,2008).")

Attitudes Towards Horses:
1) Positive
2) Neutral
3) Negative

Attitudes Towards Management Methods:
1) Positive
2) Neutral
3) Negative

Acceptability of Management Methods:
1) Acceptable
 2) NotAcceptable

MEMO 3 – Nodes
The following nodes and subnodes were created based on Priori Codes (Memo 2).

Values: (Stephenson, 2008)
V-Forms
        VF-Archaeological Features
        VF-Human-made structures

       VF-Vegetation
       VF-Historic Features
       VF-Natural Land Forms
V-Practices
       VP-Spirituality
       VP-Symbols/Ideology
       VP-Memories
       VP-Sense of Place
       VP-Meanings
       VP-Aesthetics/Beauty
       VP-Stories
V-Relationships
       VR-Human Systems
       VR-Ecological Processes
       VR-Historic Events
       VR-Historical Processes
       VR-Human Activities

[Since this set of values was designated for landscapes, it is expected that this will change as the interviews are coded; they are a starting point.]

Attitudes: (Saldana, 2009)
(H: Horses)
A-H-Positive
A-H-Neutral
A-H-Negative

(MM: Management Methods)
A-MM-PZP
       A-MM-Positive
       A-MM-Neutral
       A-MM-Negative
A-MM-Sterilization
       A-MM-Positive
       A-MM-Neutral
       A-MM-Negative
A-MM-GatherBaitAndTrap
       A-MM-Positive
       A-MM-Neutral
       A-MM-Negative
A-MM-GatherGround
       A-MM-Positive
       A-MM-Neutral
       A-MM-Negative
A-MM-GatherHelicopter
       A-MM-Positive

A-MM-Neutral
A-MM-Negative
A-MM-RemovalForHolding
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative
A-MM-RemovalForAdoption
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative
A-MM-SaleForUse
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative
A-MM-SaleForFood
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative
A-MM-SaleToOtherCountries
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative
A-MM-Euthanasia
 A-MM-Positive
 A-MM-Neutral
 A-MM-Negative

Social Acceptability: (Adapted from Saldana, 2009)
SA-Acceptable
SA-NotAcceptable

MEMO 4 – Interviews and Transcripts
The interview audio files were submitted to REV for transcription. Once the interviews were transcribed and received, the transcriptions were read by interviewee (me), who noticed that there were inaudible excerpts, some words were missing, and other words did not seem to make sense in context. Therefore, transcription documents were re-red while listening to the original audio-files in order to cross-check and edit the transcriptions, so that they are accurate. This process resulted in the finding of errors in the transcriptions, which were corrected (as possible) by the interviewee.

Interview transcriptions were uploaded to NVivo.

MEMO 5 – Classifications
Interview transcriptions were organized in Cases. Then, the Cases were organized into Case Classifications. The Case Classifications were the three separated by Cultures/Groups in order to analyze within groups and between groups.

Class Classifications:
a) Bureau of Land Management Staff (BLMS_#)
b) Bureau of Land Management Permittees (BLMP_#)
c)Wild Horse Advocates (WHA_#)

Attributes were created in order to observe demographic data that was acquired during the interviews.

Demographic information includes:
1) Age
2) Education
3) HMA
4) Sex (as perceived visually and through conversation by interviewee)

More classifications might be added later.

MEMO 6 – Coding Notes
Coded twice through.

MEMO 7 – BLMP_01
BLMP_01 - First Coding
1.   [Added Node]: Added node "Terminology" referring to which term for "wild horses" was preferred by participant and why. Information such as this will also be recorded in excel spreadsheet to compare between participants. Question regarding this is asked in interview and as the interviewer I noticed that some participants, if not most, had a preferred term and their preference was backed up by a strong opinion.
2.   [Added Node]: Added node "A-MM-Other" for "other" management methods in order to include attitudes regarding management methods that do not fit into existing nodes or appear often enough to have a new node created. Added subnodes "A-MM-Other-Positive", "A-MM-Other-Neutral", and "A-MM-Other-Negative"
3.   [Added Node]: Added node "MemorableExcerpts" to record sentences and paragraphs that stood out.
4.   Will create new Node and Subnodes with "Values" as I perceived them, while also categorizing in priori "Value codes", so that I can compare which method helps organize information better.
5.   [Added Node]: NI-NegativeImpacts and added subnodes NI-Economic, NI-Ecosystem, NI-IntraspecificCompetition, NI-Social, NI-Vegetation, NI-Wildlife. This was done to consider the impacts that wild horses are having on these different factors as mentioned by participants.
6.   [Modified Node]: Changed node "A-MM-RemovalForHolding" and its subnodes to "A-MM-Holding" in order to be more specific to the method. Changed node "A-MM-RemovalForAdoption" and it subnodes to "A-MM-Adoption" for the same reason.

BLMP_01 - Second Coding

1. [Deleted Nodes]: Nodes "V-Forms", "V-Relationships", and "V-Practices" were deleted with subnodes. These referred to values of landscapes and rarely were applicable to values of wild horses; therefore, they were no longer useful or necessary in this study.
2. [Renamed Node]: Renamed "V-New" to "V-Values". Values that emerged from interviews were more useful than values set as priori codes. Study will now rely on these values.
3. During first round of coding when gathers were mentioned but method of gather was not specified, cases were coded into all gather nodes. However, the node "A-MM-Gather" was later created. This will include the gathers for which method is not specified.

MEMO 8 – BLMP_02
BLMP_02 – First coding

BLMP_02 - Second Coding
1. A few pieces were uncoded and recoded.
2. No changes.

MEMO 9 – BLMP_03
BLMP_03 - First Coding
1. [Added node]: Added node "A-MM-Gather" and subnodes "A-MM-Gather-Negative", "A-MM-Gather-Neutral", "A-MM-Gather-Positive" to be able to classify gather when the specific method is not made clear by participant. Specific methods will also be added (repeated).
2. [Added node]: Added node "A-MM-Hunting" and subnodes "A-MM-Hunting-Negative", "A-MM-Hunting-Neutral", "A-MM-Hunting-Positive" because the method continues to be mentioned and related to wildlife management.
3. [Added node]: Added node "A-MM-Maintenance" and subnodes "A-MM-Maintenance-Negative", "A-MM-Maintenance-Neutral", "A-MM-Maintenance-Positive".
4. "Mainentance" refers to actively maintaining the horses, which means feeding and watering the horses. Although wild horses are to be managed as wild animals, this type of management is, in fact, occuring.

BLMP_03 - Second Coding
1. Uncoded and recoded a few of things. Nothing too significant.

MEMO 10 – BLME_01
BLMS_01 - First Coding

1. [Added Node]: Added subnode "V-SymbolsAndIdeaology" to "V-New". This refers to when the horse is valued as a symbol or an icon.
2. Priori codes are functioning more as a guide to creating the "V-New" list. Still considering deleting them later, since many do not seem to apply at all to the horses.
3. [Added Node]: Added node "A-MM-VolunteerWork" and subnodes "A-MM-VolunteerWork-Negative", "A-MM-VolunteerWork-Neutral", and "A-MM-VolunteerWork-Positive". Volunteer Work appears to be a big component of wild horse management in Colorado, therefore it must be considered. Although it seems that most attitudes towards Volunteer Work are positive, not all are. This is the case with some BLMP perceptions. I will go back and re-code for this node.

4.	Will need to re-code for all [Added Node]s
5.	Changing "A-MM-PZP" and "A-MM-Sterilization" to refer to length of fertility control. Ex. "A-MM-FertilityControlShortTerm", "A-MM-FertilityControlLongTerm", "A-MM-FertilityControlPermanent" and subsequent subnodes for accuracy.
6.	[Added Node]: Added node "V-Meaning". This refers to the value given to the meaning of a "wild horse".

BLMS_01 - Second Coding
1.	No significant changes.

MEMO 11 – BLME_02
BLMS_02 - First Coding
1.	[Added Node]: V-Ecosystem for when a horse is valued as part of the ecosystem in general.
2.	[Added Node]: V-Landscape for when participants seem to be focusing more on the HMA than the horse when talking about value.
3.	[Added Node]: NI-HumanSafety. Wild horses on the road are a serious safety concern in Sand Wash Basin HMA.

BLMS_02 - Second Coding
1.	Getting rid of attitudes towards wild horses (A-H). Everyone expresses liking the horses, but mostly disliking management. If I were to observe this, I would have had to make questions surrounding this. It is not about having a positive or negative attitude towards the horses, it's why. I did not acquire enough information for this.
2.	Re-coded for fences.
3.	No significant changes.

MEMO 12 – BLME_03
BLMS_03 - First Coding
1.	[Added Node]: Added node "V-WorkAid". BLMS_01 and BLMS_03 talked about how horses helped them get their job done and how they valued them for that. Will have to recode past Cases.
2.	[Added Node]: Added node "V-JobComponent". BLMS_02 and BLMS_03 talked about how they only value horses as part of their jobs. Not sure about this one but will think more about it later.
3.	[Added Node]: Added node "V-Social"; I might have to come to with a better term, but it seems that come people apply value to the horse for a sense of being part of a social group.
4.	[Added Node]: Added node "V-Behavior"; some people seem to place value on observing horses in their natural habitat, their behavior.

BLMS_03 - Second Coding
1.	No significant changes in coding.

MEMO 13 – BLME_04
BLMS_04 - First Coding
1.	Did not create any new nodes

2.   BLMS interviews appear to be becoming repetitive.

BLMS_04 - Second Coding
1.   No significant changes in coding.

MEMO 14 – BLME_05
BLMS_05 - First Coding

1.   Shorter interview.
2.   No significant changes in coding.

BLMS_05 - Second Coding
1.   No significant changes in coding.

MEMO 15 – BLME_06
BLMS_06 - First Coding
1.   No new nodes.
2.   Another example of scenario questions not being very useful.

BLMS_06 - Second Coding
1.   Fencing was not coded for yet.
2.   Removal was not coded for yet.
3.   Did some fine tuning of gather/removal coding.

MEMO 16 – BLME_07
BLMS_07 - First Coding
1.   [Added Node]: Added node "V-Resources". BLMS_07 has not been the only participant to refer to horses as a resource, therefore I will go back and recode.

BLMS_07 - Second Coding
1. A lot of corrections.
2. Double/triple coded for gathers.

MEMO 17 – WHA_01
WHA_01 - First Coding
1.   [Added Node]: Added node "V-Stories". WHA_01 begins by telling a story about her grandfather to support her value for horses. This is not a memory because she did not live it, and it is not history because it is s story only she has heard and has value to her.
2.   Classifying "photographical qualities" under "V-AestheticBeauty" since it captures the visible beauty of the horses.
3.   "A-MM-Maintenance" refers to active management of water, vegetation, or veterinarian care.
4.   [Added Node]: Added node "V-Spirituality".
5.   Not using landscape value nodes anymore.

6.   Still finding/correcting transcription errors.
7.   [Added Node]: Added node "V-Religion". Might delete later and move content to a more general value node.

WHA_01 - Second Coding
1.   I made a couple of corrections in coding. This is a complicated interview to code because participant contradicts their own opinions often.

MEMO 18 – WHA_02
WHA_02 - First Coding
1.   [Added Node]: Added node "V-Spirituality" to refer to anything referring to healing and spirituality. Might double code V-Religion here. V-Religion refers to specific religion or religious practices.
2.   [Added Node]: Added node "A-MM-Fencing" and subnodes "A-MM-Fencing-Negative", "A-MM-Fencing-Neutral", "A-MM-Fencing-Positive". Too many participants have talked about some sort of fence management; it needs its own node.
3.   Noticed I have not been paying much attention to V-Landscapes... I will get it on the next round of coding.
4.   Might have to separate "Gather" from "Removal"
5.   Management methods being considered: Permit Management, sanctuaries

WHA_02 - Second Coding
1.   NVivo failed and restarted. Everything looks ok except "changes in ranching" and "wild vs feral".
2.   No significant changes in coding.

MEMO 19 – WHA_03
WHA_03 - First coding
1.   [Added Node]: Added node "V-Riding". Will be repeated with some instances of V-WorkAid. Might delete one later.
2.   [Added Node]: Added node "A-MM-RangeManagement" and subnodes "A-MM-RangeManagement-Positive", "A-MM-RangeManagement-Neutral", and "A-MM-RangeManagement-Negative". This will result in recoding, especiall from "A-MM-Other" and "A-MM-Maintenance". "Seedings" will go under "A-MM-RangeManagement".
3.   Coloring will be coded under "V-Genetics". Stakeholders manage for coloring with genetics.
4.   Clarify and clearly differ "meaning" and "symbols and ideology" by next round of coding.
5.   [Added Node]: Added node "A-MM-Removal" and subnodes "A-MM-Removal-Positive", "A-MM-Removal-Neutral", and "A-MM-Removal-Negative" because round up or gather is not the same as removal.

WHA_03 - Second Coding
1.   No significant changes.