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Characterizing Relational Values to Inform Message-Framing at the Boa Ogoi Historical Site

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CHARACTERIZING RELATIONAL VALUES TO INFORM MESSAGE-FRAMING AT THE BOA OGOI HISTORICAL SITE

by

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ABSTRACT

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by

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Public discourse on politicized environmental issues, such as climate change, has rapidly grown more divided, leading researchers to pay greater attention to how the dissemination of scientific knowledge relates to the attitudes and beliefs of the general public toward environmental risk. Cultural cognition theory, or the tendency of an individual to believe and behave in such a way that adheres to the group they identify with, attempts to explain the inconsistencies between individual behavior and scientific recommendation for behavior aimed at reducing environmental risk. The emerging field of relational values also offers some insight when investigating behaviors as related to natural resource management, providing more clarity on the values that inform the relationship individuals have with their environment. Persistent declines in biodiversity, reduced water quality and other issues call for creative solutions, creating a need for collaboration between scientists and other groups who may hold useful knowledge in the

fight against environmental degradation. Indigenous and local knowledge systems can complement western scientific knowledge and enhance knowledge and governance of social-ecological systems; this process can be enriched by a mutual understanding of the values and perspectives of the individuals who hold the knowledge itself. This thesis research contains two distinct studies: the first focuses on bringing together literature on cultural cognition with the emerging field of relational values in conservation science. Insight from this literature was used to analyze interviews with landowners local to the Battle Creek region of southern Idaho, where the Northwestern Band of the Shoshone Nation (NWBSN) has begun construction of the Boa Ogoi Historical Interpretive Center, as well as the process of restoring the surrounding landscape. The results of this study suggest that message-framing that focuses on relational values–such as concern for future generations and community– could potentially circumvent bias of scientific information borne from participants subscribed groups and worldview. The second study contributes to a knowledge weaving framework by characterizing land managers' relational values to identify potential barriers and opportunities for collaborative restoration efforts in the Battle Creek watershed and identify local knowledge and preferences with regard to site-specific species. The results of this study suggest that the relationship landowners have with these species can be better understood through the lens of relational values of stewardship such as reciprocity and a responsibility to other people.

(137 pages)

PUBLIC ABSTRACT

Characterizing Relational Values to Inform Message-Framing at the Boa Ogoi Historical Site

Cole Stocker

In an increasingly polarized political climate–particularly in the U.S.–environmental issues such as climate change and its effects on the environment have become hot-button partisan talking points resulting in further division. This has led to research on ways to communicate science which does not further inflame political tensions, but rather reinforces and validates the audience's values. Science communication research provides the foundation for my case study, which focuses on characterizing the environmental values and worldviews of land managers residing and working near the Boa Ogoi Historical Site in southern Idaho. The Northwest Band of Shoshone Nation (NWBSN) is in the process of building a cultural interpretive center at Boa Ogoi, as well as restoring the land surrounding the site of the 1863 Bear River Massacre to ecological conditions similar to the years before the event. The Tribe has shown interest in working with their neighbors, particularly those upstream. This could help them achieve larger restoration goals for Boa Ogoi, particularly improving the highly degraded water quality on the site. This research seeks to inform the Tribe's and the Tribe's restoration collaborators' communication efforts with upstream land managers. My first study uses interview data with 12 nearby land managers to identify important values underlying the relationship that local land stewards have with the management of their land. I compare these values with a profile of the dominant political

and religious groups of the area. Interview participants largely identify as land stewards who feel a responsibility to care for land as well as their communities. In my second study, data from my interviews highlighted important plant and animal species in the region, specifically beaver, mule deer, elk, and Russian olive. My analysis of the relationships that landowners have with these species shows that they manage them largely out of a sense of responsibility to their neighbors and community, as well as a responsibility to future generations. Many of the study participants were members of families who had resided in the area for multiple generations, which gives many of them knowledge of and preferences related to managing these species. Understanding how these individuals value the species in question could be important for building working relationships between the Tribe and their neighbors, such as collaborative invasive species management and a collective effort to improve habitat for valued game species like mule deer.

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CHAPTER I: INTRODUCTION

Worldviews influence environmental values

A growing literature has documented a host of environmental issues resulting from anthropocentric activity, e.g., biodiversity loss, air and water pollution, and the spread of invasive species (McElwee et al. 2020). Public discourse on many of these issues has rapidly grown more divided, leading researchers to theorize on how the dissemination of scientific knowledge on topics that have become politicized relates to the attitudes and beliefs of the general public toward particular environmental risks (Kahan 2010). Cultural cognition theory—the tendency of an individual to believe and behave in such a way that adheres to the group they identify with—attempts to explain the chasm that can exist between individual behavior and scientific recommendation for behavior aimed at reducing risk (Kahan et al. 2012). The emerging field of relational values also offers some insight when investigating these behaviors, providing more clarity on the values that inform the relationships individuals have with their environment (Chan et al. 2016; Chan, Gould, and Pascual 2018a; Klain et al. 2017)

The prevalent environmental problems of the day, such as ongoing drought and water shortages, increased frequency and intensity of wildfires, and poor air quality, call for creative solutions, creating a need for collaboration between scientists and other groups who may hold useful knowledge in the fight against environmental degradation. Indigenous and local knowledge systems can complement western scientific knowledge and enhance knowledge and governance of social-ecological systems (Tengö et al. 2017). Applying distinct knowledge systems to natural resource management decisions is

enriched by mutual understanding of the values and perspectives of the individuals who hold the knowledge itself (Sheremata 2018).

This thesis aims to first bring together academic literature on cultural cognition (Kahan et al. 2012) with the field of relational values in conservation science (Chan et al. 2016, 2018; Klain et al. 2017) to analyze interviews with landowners local to the Battle Creek area of southern Idaho (Figure 1.1). This region is where the Northwestern Band of the Shoshone Nation (NWBSN) has begun construction of the *Boa Ogoi Historical Interpretive Center* as well as the process of restoring the surrounding landscape to a semblance of pre-colonial conditions. I apply insight from cultural cognition to offer message-framing recommendations based on a profile of demographic and political data in the area, reinforced by relational values coded from these interviews.

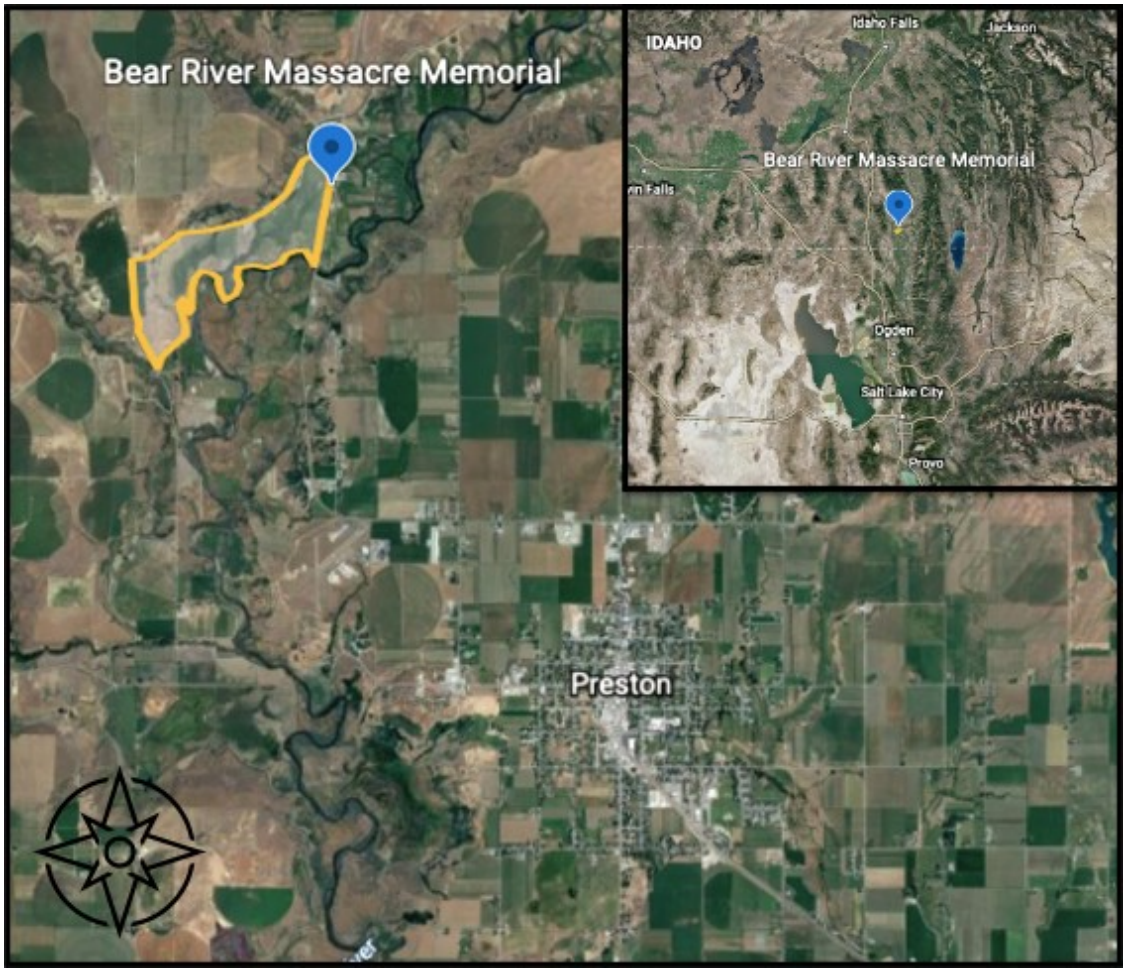

Figure 1.1 Boa Ogoi in yellow outline, the site of the Bear River Massacre of 1863.

My second study approaches Tengö et al.'s (2017) knowledge weaving framework (Figure 1.2) particularly the first step, mobilization, from the lens of relational values. I characterize relational values present within my interviews to identify potential barriers and opportunities for collaborative restoration efforts in the Battle Creek watershed. I also identify local knowledge and preferences about four species in particular which are significant to stewardship efforts in the area: elk (*Cervus Canadensis*), Mule deer (*Odocoileus hemionus*), Russian olive (*Elaeagnus angustifolia*), and beaver (*Castor canadensis)*. Both studies will serve to better inform the Boa Ogoi

site stewardship plan and the NWBSN's efforts to build a cultural interpretive center and restore endemic species at this site.

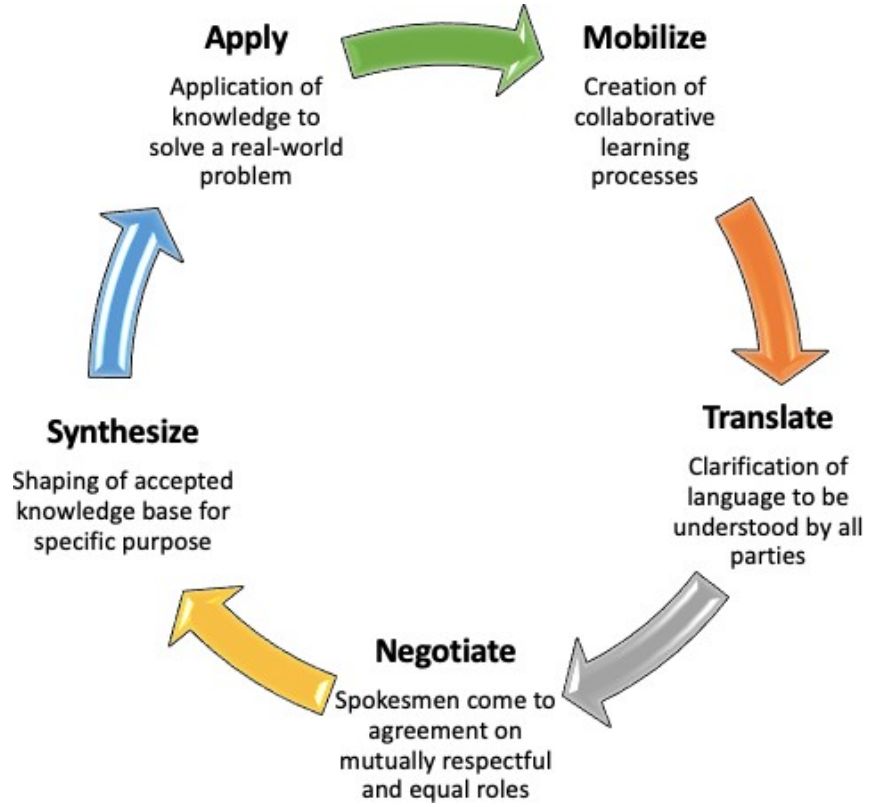

Figure 1.2 Tengö et al.'s (2017) Five-step Knowledge Weaving Process.

Literature Review

Weaving Knowledge Systems

Defined by Tengö et al. (2017) as "adherence to a body of propositions, whether formally or informally, that are routinely used to claim truth" (page 18), knowledge is often specific to certain contexts. A knowledge system is often of great use to its holder but can create confusion to others if taken out of the context for which it was created

(Tengö et al. 2014). Knowledge is often passed down over multiple generations for the purpose of informing decisions and actions based on the wisdom of past learning (Cruikshank 2012).

Three types of knowledge systems are of particular relevance to my research: local knowledge (LK), indigenous knowledge (IK), and western scientific knowledge (WSK). Weaving these knowledge systems can support multiple perspectives (Tengö et al. 2017) and expand restoration and conservation actions (Raymond et al. 2010). "Place-based observations," embedded in local and indigenous knowledge, can offer insight into how local residents understand their environment (Rathwell, Armitage, and Berkes 2015). In contrast, WSK may be less available to those who find themselves disconnected from the scientific community because it identifies general patterns that are initially published in academic journals, but often are not disseminated to broader audiences through alternative mediums such as magazines, documentaries, books, and radio. Knowledge can also be effectively transferred through storytelling, rituals, traditions, and art (Hill et al. 2020).

Indigenous Knowledge (IK), in particular, is held by cultures which are historically native to an area and in many cases can offer thousands of years' worth of wisdom (Weatherford, 1988). While IK is undeniably important, my research will focus on characterizing LK while proposing recommendations for knowledge weaving at the Boa Ogoi site.

LK "refers to the informal, lay, personal, often implicit or tacit, but possibly expert, knowledge held by land managers involved in environmental decision making" (Raymond et al. 2010). Though it can be multi-generational, LK is not limited to specific

groups or inhabitants who have ancestral roots to an area (Tengö et al. 2017). Like IK, LK can pertain to land management practices, invasive species management, and agricultural methods (Joshi et al. 2004). It can also be useful in addressing environmental degradation caused by agricultural pollution, road construction, grazing, water diversion, and destruction of riparian areas by livestock (Kauffman, 1997). Local farmers and ranchers often hold an intricate understanding to how changing local management and climate regimes and long-term dynamics of key plant species influence variation of vegetation properties (Knapp and Fernandez-Gimenez 2009). Like WSK, LK also utilizes observation, data collection, and experimentation to solve problems at a local scale (McElwee et al. 2020). Finally, I argue that LK can inform how its holders relate to the world around them, such as valuing one plant species over another based upon specific knowledge of its uses. This provides an opportunity to apply relational values to potentially increase recognition and validation of LK systems (Schulz and Martin-Ortega 2018).

Relational Values

Identifying the values of diverse stakeholders can be crucial for environmental management (Chan et al. 2016a). Conservation social scientists have traditionally viewed how humans value nature through two values systems: instrumental and intrinsic values (Allen et al. 2018). Intrinsic values are embedded in how humans value nature for its own sake (Stålhammar and Thorén 2019). Some social scientists contend that intrinsic values largely motivate conservation science, arguing that there are non-human parts of nature that are good and deserving of protection, regardless of their instrumental, or economic

value (Batavia and Nelson 2017). Yet, some environmental policies based on intrinsic values can be too aggressive to some stakeholders– such as eliminating resource extraction activity in a certain area to preserve habitat for a threatened species– and can result in controversy between groups who value an area differently (Allen et al. 2018).

In contrast to intrinsic value systems, instrumental values relate to nature as a means to an end, where components of ecosystems are often quantified as monetary values, which can be seen as potentially problematic (Jax et al. 2013). Environmental policy decisions that at their root are based on instrumental values are often driven by economics, such as managing for maximum sustainable yield for a timber harvest. They can often overlook crucial dimensions of how nature is important to people that are not appropriately expressed in monetary terms, such as preserving a grove of trees that is considered sacred by a culture (Chan et al. 2018a).

Stålhammar and Thorén (2019) argue that deeper and more intimate relationships between humans and their environment exist that are not adequately described by either instrumental or intrinsic values. These relationships can be built on values that are anthropocentric, yet not instrumental. An example of this would be preserving a forest because of a spiritual event that is believed to have happened there, or the preservation of battlefields or historical sites. To further understand these relationships with an eye towards environmental management decisions that benefit people and ecosystems, social scientists have turned to a third class of values in the conservation science literature: Relational Values.

Relational Values can be defined as “values linking people and ecosystems via tangible and intangible relationships to nature as well as the principles, virtues, and

notions of a good life that may accompany these" (Klain et al. 2017). Eudemonic values, or the "notion of a good life" fall within the realm of relational values; living a good life on a landscape often involves being a "good steward of the land" or a "good farmer" (Allen et al. 2018). These values also pertain to care, as well as sense of place, which is the meaning or attachment to a particular setting (Peçanha Enqvist et al. 2018). An individual's relationship with the land itself contains preferences, principles, and virtues associated with its care, or overall stewardship (Chan et al. 2016a). I argue that understanding relational values can be key to multi-stakeholder engagement and can be important in the creation of effective, long-lasting environmental solutions.

Cultural Cognition

The divisive nature of American politics has inhibited concerted responses to some environmental risks, such as the risk of catastrophic climate change due to a failure to abate greenhouse gas emission. Partisan politics has created doubt about collective solutions to climate change, leading social scientists to theorize on potential ways to communicate science in ways that minimize the risk of it being politicized (Kahan et al. 2012). In the social science literature, two models of risk perception have been prominent; these are the "rational weighers" and "irrational weighers" concepts (Kahan et al. 2015). The "rational weighers" concept posits that the individuals who make up the general public as a whole are largely capable of understanding and processing disseminated scientific information in a way that is consistent with scientific consensus on the subject being communicated. This would mean that just communicating scientific information in a clear and concise way would be enough to influence individuals to

behave in a way that is consistent with scientific recommendations. In the context of climate change we know this not to be the case, as the subject has led to decades of political debate and in some cases, outright denial which has largely inhibited a national-level responses to the threat of global climate change in the U.S. (Kahan et al. 2012, 2015; Newman, Nisbet, and Nisbet 2018).

The "irrational weigher" model instead assumes that the general public is largely incapable of digesting scientific knowledge at an individual level, making it unlikely that they will respond to data on environmental risk with pro-environmental behavior, such as reduced consumption or plastics recycling. The model suggests that this is due to bias created by the tendency for individuals to behave in line with their own partisan identity, rather than their own research and analysis of information (Kahan et al. 2015). Though partially explaining political polarization, the "irrational weigher" model ultimately fails to address the fact that studies have shown that people are capable of comprehending science at an individual level yet often choose to ignore or deny it anyway, especially when it conflicts with the cultural groups to which they belong (Kahan et al. 2011, 2012; McCright and Dunlap 2011).

Contrary to "rational weighers" and "irrational weighers", Cultural Cognition Theory posits that a large percentage of the American general public are perfectly capable of understanding the information that is being communicated to them, but instead suggests that, in the case of climate change denial and other particularly politicized risks, individuals have a tendency to form irrational perceptions of risk based on previously held beliefs, expectations, and values (Kahan et al. 2011). Often these are associated with a group identity, such as religious or political affiliations (Newman et al. 2018) as well as

"cultural ways of life", which include communitarianism, individualism, egalitarianism, and hierarchy (Kahan et al. 2012). For example: self-identified conservatives often hold individualistic values, believing that individuals are responsible for their own success and well-being. Conservatives value a hierarchical society which features competition and unequal social standing that determines resource allocation (Newman et al. 2018). Self-identifying liberals instead tend to prefer communitarianism, which allows for the reliance of its members on each other and values frequent social interaction. Liberals also tend to believe in an egalitarian society, which puts less value on hierarchy and instead offers more equal opportunities to its members (Newman et al. 2018). In the U.S. particularly, individuals who subscribe to either conservative or liberal views often disregard information through selective processing, at times even adopting attitudes and beliefs that oppose the information they are given because it conflicts with their worldview (Newman et al. 2018). People would rather take an opposing viewpoint, however irrational, than risk estrangement from the group to which they subscribe (Kahan et al. 2012).

Kahan et al. (2012) recommends creating a climate for science communication by avoiding polarizing language, offering that debate surrounding many environmental issues will continue as long as scientific discourse is perceived in a way that causes a clash of worldviews, such as the use of climate science as a political tool to widen partisan gaps. This communication climate can also be improved by crafting messages in ways that highlight and support the values held by a target audience, which could create situations that allow for acceptance of science and scientific recommendations by the

individual without the risk of alienation from the groups that they subscribe to or creating cognitive dissonance with their worldview.

Thesis Purpose

By utilizing the literature on cultural cognition, this thesis research first attempts to create a profile of dominant groups and worldviews that individuals local to the southern Idaho and northern Utah area could potentially subscribe to. Using data from interviews with 12 local landowners, my first study serves to characterize relational values of land stewardship that are important to interviewees that could either serve as barriers or opportunities for collaborative restoration efforts between locals and the NWBSN. I also offer analysis on a possible connection (or lack thereof) between relational values of stewardship held by the individual and the value systems of the groups and worldviews that they may subscribe to. This information will serve to better inform the Boa Ogoi site restoration plan–more specifically in message crafting efforts between NWBSN land managers and neighboring landowners. Utilizing relational value data in conjunction with cultural cognition insight is a novel approach, with potential for motivating individual behavior to improve environmental quality in other locations than this specific case study.

The second study argues that the Boa Ogoi site restoration could benefit from the co-production of valuable knowledge between scientific professionals and local and indigenous knowledge holders, which could better inform potential large-scale collaborative restoration. I recognize the importance of contributing to a foundation of knowledge for further collaborations with the Tribe, residents of the region, and Utah

State University faculty and students who are involved with the restoration project at Boa Ogoi. This study uses relational value data to contribute to a knowledge-weaving process created by Tengö et al. (2017), particularly to the first step of mobilization. I posit that characterizing relational values of stewardship at the Boa Ogoi site could possibly contribute to stronger working relationships between the Tribe and their neighbors built on mutual understanding. Further, I argue that the relationships between locals and four specific species at the site– elk (*Cervus Canadensis*), Mule deer (*Odocoileus hemionus*), Russian olive (*Elaeagnus angustifolia*), and beaver (*Castor canadensis*– can be better understood through the lens of relational values and could further enrich the knowledge weaving process at the site. Characterizing relational value data to better inform the knowledge-weaving process is also a novel approach, with potential applications in other locations as well.

Research Questions

My first study addresses:

1. How do the roles, rights, and responsibilities embedded in notions of self-described good stewardship differ among locals in the Battle Creek watershed region?

My second study seeks to answer:

2a. How do relational values linked to specific plant and animal species differ among people who live or work on land near Boa Ogoi?

2b. What are the barriers and opportunities for weaving LK and Relational Values into overall stewardship planning of the Boa Ogoi site?

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CHAPTER II: UNDERSTANDING CULTURAL IDENTITIES AND RELATIONAL VALUES TO INFORM WATERSHED RESTORATION MESSAGE-FRAMING AT THE BOA OGOI HISTORICAL SITE

Introduction

Competing worldviews within American society have given way to increasingly divisive discourse on the subject of environmental risk, and a need for effective methods of communicating science in ways that avoid further polarization (Kahan et al., 2012). As scientific consensus grows on the subject of climate change, public opinion has rapidly grown more divided, leading researchers to theorize on how the dissemination of scientific knowledge relates to the attitudes and beliefs of the general public toward environmental risk (Kahan, 2010a). Specifically, "Cultural Cognition Theory"—an attempt to explain the tendency of an individual to believe and behave in such a way that adheres to the group they identify with—attempts to offer some explanation of the dissonance between individual behavior and scientific recommendations for behavior aimed at reducing environmental risk (Kahan et al., 2012). These behaviors can be further investigated through the lens of the emerging field of relational values, which has added insight on the values that inform relationships individuals have with their environment and its governance (Chan et al., 2016a, 2018a; Klain et al., 2017)

In this chapter, I review cultural cognition and relational values literature. I then use a case study approach to bring together these topics to analyze interviews with landowners located in Southern Idaho and Northern Utah near the stewardship efforts at

the *Boa Ogoi Historical Site*, where the Northwestern Band of the Shoshone Nation (NWBSN) has started building a cultural interpretive center and restoring the surrounding landscape to a semblance of pre-colonial conditions. The Tribe hopes to foster strong working relationships with surrounding landowners in order to reach their long-term restoration goals, which could involve larger scale restoration efforts in the Battle Creek Watershed region of Franklin County, Southern Idaho. I suggest that understanding how these individuals perceive risk is a crucial step in creating informed communication efforts with a target audience in the context of environmental change. To these ends, I recommend messaging that appeals to the values and cultural identities of the individuals who live and work on the land near the Boa Ogoi Site.

Theoretical Context

Cultural Cognition

Two prominent models of risk perception include "rational weighers" and "irrational weighers" (Kahan et al., 2015). The first is that individuals in society can be considered as "rational weighers." Accordingly, members of the public are capable of processing scientific information in a manner that is in line with scientific consensus on the matter. Following this logic, communication of sound scientific information should be enough to influence desired behavior that is consistent with scientific recommendations. This rational weigher model, though useful in some contexts (e.g., when a scientific matter is not politicized), has not turned out to be the case in relation to climate change, a topic that has provoked a decades-long debate resulting in political

entrenchment and outright denial of scientific data in some cases (Kahan et al., 2012, 2015; Newman et al., 2018).

The second model of risk perception assumes that the general public are "irrational weighers", lacking the ability to "advance their expected utility" in response to given information regarding environmental degradation in the form of a change to more pro-environmental behavior, such as reduced consumption (Kahan et al., 2015, pg. 194). The model posits that this is due to cognitive biases and other "manifestations of bounded reality", or the tendency for individuals to take their behavioral cues not through their own process of research and analysis of information, but by taking a position in line with their partisan identity (Kahan et al., 2015). This may partially explain political polarization, but ultimately fails to address the reality that studies have shown that people are capable of comprehending science at an individual level but at times still choose to ignore or deny it anyway when it runs counter to the cultural groups to which they belong (Kahan et al., 2011, 2012; McCright and Dunlap, 2011).

Cultural cognition theory gives the individual the benefit of the doubt; instead of assuming that the public lacks scientific literacy, it instead posits that a large percentage of the general public are perfectly capable of understanding the information that is being communicated to them (Kahan et al., 2011). In fact, the problem might not be lack of information or the ability by the individual to rationalize it. By rationalize I mean a "citizen's effective use of their knowledge and reasoning capacities to form risk perceptions that express their cultural commitments" (Kahan et al., 2011, pg. 1). Instead, the problem may be due to the tendency for individuals to form irrational perceptions, defined as the "state of antagonism between an agent's goals and the decision-making

processes the agent uses to attain them" (Kahan et al., 2011, pg. 3). These irrational risk perceptions are based on previously held beliefs, expectations, and values (Kahan et al., 2011). Often these are also associated with a group identity, such as religious or political affiliations (Newman et al., 2018). The tendency for a difference in rationality rooted in worldview or group identity has in effect created a chasm in rational decision-making processes between the individual and the individual as a member of the subscribed group or worldview that they belong to (Kahan et al., 2011).

Cultural cognition has its roots in Starr's 1969 publication "Social Benefit vs. Technical Risk" where the author claimed that society achieves an optimum balance between the risks and benefits associated with a particular activity (Starr, 1969). Wildavsky et al. (1990) further explored risk perception, stating that perceptions of danger associated with an activity are selective and tend to vary with the object of attention. The authors gave the example of the politicization of AIDS, where a stark difference in policy can be attributed to a disagreement between worldviews, furthering uncertainty on the overall risk involved with the epidemic (Wildavsky et al., 1990). Slovic et al. (1990) offers more insight on risk perception with the psychometric paradigm, which states that risk is defined by individuals subjectively based on their own range of psychological, social, institutional, and cultural biases. The psychometric paradigm also contends that the factors and interrelationships between these biases can be quantified and ultimately used to predict an individual or societal response to certain hazards (Slovic, 1990).

Kahan builds from Wildavsky and Slovic when defining the cultural cognition theory. According to this theory, individuals form perceptions of risk based on "cultural

ways of life", which include communitarianism, individualism, egalitarianism, and hierarchy (Kahan, 2012b) as shown in Figure 2.1. This furthers Wildavksy et al.'s (1990) claims that differing worldviews tend to disagree on the ranking of risk by importance.

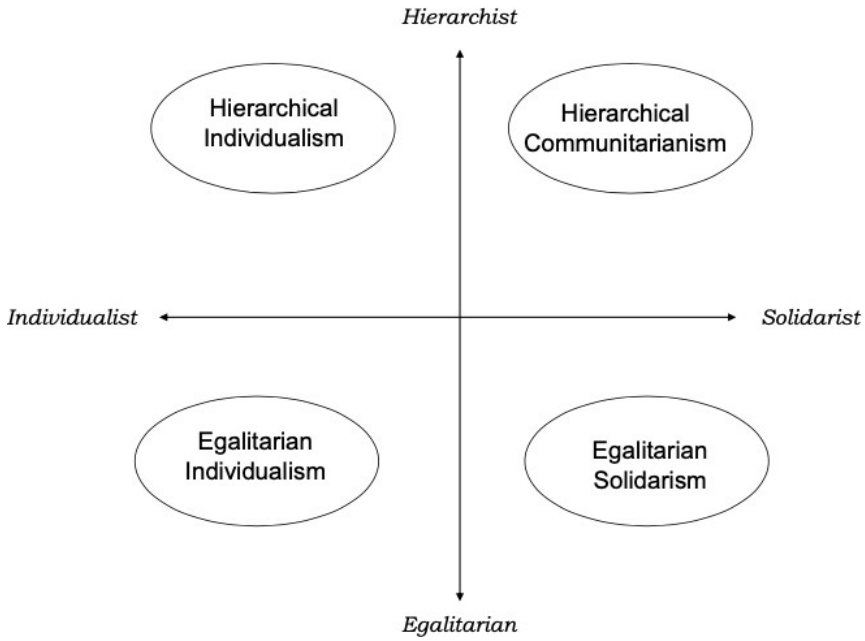

Figure 2.1 Cultural Cognition "ways of life" from Kahan (2012b), showing a possible spectrum of value systems.

Individuals who self-identify as conservative often hold individualistic values, desiring a society where individuals are responsible for their own success and well-being. They also tend to believe in a hierarchical society which features competition and unequal social standing that determines resource allocation (Newman et al., 2018). Self-identifying liberals tend to prefer a society which values its members relying on each other and supports frequent social interaction. They also tend to prefer an egalitarian society which lacks hierarchical restraints and offers more equal opportunities) (Newman et al., 2018).

Kahan et al. (2012) states that debates surrounding issues such as climate change, gun control, and HPV vaccine usage will continue as long as they contain cultural meanings that divide between worldviews, such as the use of climate science as a political wedge in partisan debate. Instead, Kahan et al. (2012) recommends creating a climate for science communication by avoiding polarizing language and crafting messages in a way that highlights and supports the values held by a target audience, thereby creating situations in which acceptance of science does not conflict with worldviews. Newman et al. (2018) states that individuals who subscribe to either conservative or liberal worldviews in the U.S. (which totals approximately 2/3 of US voters with the remaining 1/3 as self-described independents (PRC, accessed 2021)) engage in selective processing of information that does not reinforce their beliefs, often going so far as adopting attitudes and beliefs that directly oppose the information they are given. People would rather take an opposing viewpoint, however irrational, than risk estrangement from the group they subscribe to (Kahan et al., 2012). When it comes to effective scientific communication, Kahan et al. (2012) recommends framing messages that appeal to the values of particular audiences. The literature on cultural cognition and environmental values leads me to believe that communication recommendations rooted in the foundation of cultural cognition may be more effective to motivate pro-environmental behavior if they incorporate relational values in the context of land stewardship.

Relational Values

Identifying the values of diverse stakeholders is crucial for environmental management (Chan et al., 2016a). Conservation social scientists have traditionally

viewed how humans value nature through two overarching lenses: instrumental and intrinsic values (Allen et al., 2018). Instrumental value relates to nature as a means to an end. In the ecosystem services literature, the instrumental value components of ecosystems are often quantified as monetary values, which can be problematic (Jax et al., 2013). Environmental policy decisions based on instrumental values are often driven by economics, such as managing for maximum sustainable yield for a timber harvest, which overlook crucial dimensions of how nature is important to people that are not appropriately expressed in monetary terms, such as preserving a grove of trees that is considered sacred by a culture (Chan, 2018).

In contrast to instrumental values, intrinsic values are embedded in how humans value nature (Stålhammar and Thorén, 2019). Batavia and Nelson (2017) contend that the field of conservation is premised on intrinsic values, arguing that there are non-human parts of nature that are good and deserving of protection, regardless of their instrumental or economic value. Environmental policies based on intrinsic values tend to be heavy handed and prescriptive, often relying on "command and control," such as halting logging or grazing activity in a certain area to preserve habitat for a threatened species or removing residents of an area designated as a protected area or park. This can sometimes result in resistance from individuals who value an area more for its instrumental than its intrinsic worth (Allen et al., 2018).

Instrumental and intrinsic values fail to address deeper, intimate human-environmental relationships, which can be anthropocentric, yet not instrumental, such as valuing a site as sacred because of past events that happened there, like a battlefield or the location of annual religious ceremonies (Stålhammar and Thorén, 2019). To further

understand these relationships with an eye towards environmental management decisions that benefit people and ecosystems, social scientists have turned to a third class of values in the conservation science literature: relational values.

Relational values can be defined as "values linking people and ecosystems via tangible and intangible relationships to nature as well as the principles, virtues, and notions of a good life that may accompany these" (Klain et al., 2017, pg. 1). Eudemonic values, or the "notion of a good life" fall within the realm of relational values; living a good life on a landscape often involves being a "good steward of the land" or a "good farmer" (Allen et al., 2018). These values also pertain to care, as well as sense of place, which is the meaning of or attachment to a particular setting (Tengö et al., 2017). An individual's relationship with the land itself contains preferences, principles, and virtues associated with its care, or overall stewardship (Chan et al., 2016).

Stewardship can be broken into three distinct parts: care, knowledge, and agency: care for the land requires knowledge and the ability to apply it (Peçanha Enqvist et al., 2018). Meaning can also be attributed to the use of the word "stewardship" itself. Peçanha Enqvist et al. (2018) explains that the word can have four different meanings. The first is based on ethics, or perceived duties and obligations. This is how one should relate to one's environment based on their own moral principles of right and wrong. The word can also be used in a motivational sense; the attitudes, traits, and predispositions that motivate human beings to participate in pro-environmental behaviors. These are most commonly instrumental interests, as well as emotional and social attachments. The third use of the word is the most common, which is based on an action. In this sense, stewardship is a reference to a particular activity, practice, or initiative engaged in by

particular actors. This could be, for example, an action intended to accomplish an environmentally beneficial task such as restoration of riparian buffers in order to improve wildlife habitat and water quality. The final use of the word "stewardship" pertains to a specific outcome: this would be the pursuit or achievement of a set of results that are perceived to be desirable (Peçanha Enqvist et al., 2018). Different meanings and definitions can underly different intentions, creating a need for clarification and understanding for each unique situation.

With this in mind, the goal of this research is to further understand the underlying relational values held by land stewards in the Battle Creek Watershed Region in Southern Idaho and propose community engagement materials that align with and potentially affirm local land manager's cultural identities. This research will also attempt to identify values that could serve as barriers for collaborative restoration effecting the watershed as a whole. The Boa Ogoi site restoration process aims to transform a heavily grazed area with an incised channel into meandering stream and riparian habitat to support species that are culturally significant to the NWBSN. The following section introduces the historical context that has led to the current social and ecological landscape of Boa Ogoi and its surrounding area.

Study Context: Boa Ogoi Historical Site

Boa Ogoi, translated as "Big River" from the Shoshone language, was named "Bear River" by colonial settlers, and is located near the modern-day town of Preston in Southern Idaho. A customary wintering spot due to the presence of hot springs nearby,

the area was frequently where multiple bands of Shoshone gathered for the "Warm Dance", a large celebration which aimed to hasten the approach of spring (Parry, 2019).

Nearly all of the visiting bands had left by the morning of January 29th, 1863, when Colonel James Connor and cavalry attacked the remaining encampment, mainly comprised of NWBSN, led by Chiefs Sagwitch and Bear Hunter. Spurred on by vague accusations from local Mormon settlers, Connor was seeking retribution for petty theft and scattered violence thought to be attributed to the NWBSN. The band lost nearly 400 men, women, and children, making this one of the largest mass killings of native peoples in American history (Madsen, 1985). Settlers, journalists, and historians labeled it the "Battle of Bear River" for nearly 150 years, lending its name to local landmarks such as "Battle Creek" and "Battle Mountain" (Madsen, 1985).

In 2008, the NWBSN purchased the site of the Massacre. Ten years later, the Tribe purchased an additional 500 acres of the surrounding land with the intention of creating the *Boa Ogoi Cultural and Interpretive Center*, a state-of-the-art building designed to host tribal events, educate visitors and to pay respects to those who died during the massacre (Parry, 2019). Leaders of the Tribe, in conjunction with Utah State University professors and students, have been formulating a land stewardship plan, with intent to "restore" the area to as close to pre-1863 conditions as possible. Restoring the land will prove to be a daunting task given changes in climate and land use in the years since it has been settled. As in many similar regions in the Western U.S., encroachment of invasive species, poorly timed livestock grazing at excessive levels, removal of native vegetation, construction of roads, and other activities have affected water and soil quality and greatly altered vegetation. Large tracts of habitat for many species that are traditional

food sources for indigenous people have been destroyed (Kauffman, 1997). The NWBSN aim to embed their culture into how they manage this site, which includes restoring traditional food sources, e.g., endemic trout and chokecherries. They recognize that upstream uses of land impact their property via, for example, impacts to water quality, thus they are open to opportunities for collaboratively working with nearby landowners to achieve ecological goals for their land. To do this requires an understanding of local culture and community identities. Below I offer a profile of cultural identities and worldviews relevant to the Battle Creek watershed of Franklin County, Idaho.

Mormon Culture Region

The Battle Creek Region of Southern Idaho lies well within the "Mormon Culture Region" (Figure 2.2), the geographical sphere of influence originating from the settlement of the Church of Jesus Christ of Latter-Day Saints (LDS) in Utah in the mid-nineteenth century (Meinig, 1965). As mentioned before, the encroachment of Mormon settlers on Native American lands set the stage for conflict that ultimately

Figure 2.2 The Mormon Culture Region (Meinig, 1965).

led to the retaliatory efforts of the U.S. military at the Bear River Massacre (Madsen, 1985; Parry, 2019). According to the Association of Statisticians of Religious Bodies, Franklin County (where the Massacre Site is located) is still home to a large population who subscribe to the LDS faith — 11,345 self-described church members, or nearly 85% of the population of the county.

Brehm and Eisenhauer (2006) highlights the important cultural influence that religion, particularly Mormonism, has on environmental attitudes. The LDS faith, similar to other sects of Christianity, subscribes to the "dominion over nature" perspective, valuing conservation of resources for future use and consumption over preservation of nature for its own sake. LDS members tend to exhibit a high level of animosity toward outside involvement in land management issues, specifically federal government control. Members of the Mormon faith also have high degrees of attachment to their community and its health (Brehm and Eisenhauer, 2006). Interestingly, Mormons express greater environmental concern than the general U.S. population, yet they are less likely to act on that concern (Hunter and Toney, 2005).

Former NWBSN chairman Darren Parry describes the Shoshone conversion to the LDS faith, citing similarities in spiritual beliefs, such as the importance of "laying hands" to heal the sick and afflicted, and the belief in an all-powerful God or "Great Spirit" (Parry, 2019). Many of the band subscribe to the faith today, and the LDS church has provided a significant portion of the funding to purchase the site of the massacre as well as the donation of construction management support (D. Parry, 2020, personal communication).

Regional Voting Patterns

Similar to other states in the Intermountain West, Idaho has leaned heavily conservative in elections; the state has voted Republican in every presidential election since 1964 (270ToWin). Franklin County is no different: in 2016, residents voted for Trump over Clinton 70.9% to 7%, and more recently in 2020 voted for Trump over Biden 87.7% to 9.9 %(MIT, NY Times (Nov. 3, 2020)). As mentioned earlier, conservatives are more likely to subscribe to a hierarchical society driven by individual values; they are also more likely to participate in "system justification", supporting the maintenance of the societal status quo and resisting attempts for change (McCright and Dunlap, 2011).

Demographics and The White Male Effect

In addition to being largely conservative, Franklin County is also predominantly white: of a population around 13,500 in 2014, 12,266 (91.1%) of residents were white (Idaho-demographics.com, accessed 2021). Studies show higher rates of concern for the environment in non-white groups (Macias 2016). Women are also more likely to show greater concern over environmental risks than men (Shi 2015). According to the latest census, 48.7% of Franklin County's population identify as women.

Finucane et al. (2000) explains the concept of the "White Male Effect"– the most prominent deniers of environmental risk tend to be conservative white males. These individuals tend to find it disconcerting that behavior seen as "noble" and right, such as relentless pursuit of commerce and industry, can actually be damaging to society (Kahan, 2010) and tend to deflect threats to the identities and worldviews they hold (McCright and Dunlap, 2011). Given the consistent election results and demographics of Franklin

County, it is likely that neighboring landowners subscribe to or are at least influenced by conservative worldviews.

Given a profile of demographics and likely worldviews of the residents of Franklin County, this research attempts to answer two questions:

1. How do the roles, rights, and responsibilities embedded in self-described good stewardship differ among individuals in the Battle Creek Watershed?
2. Do the relational values of study participants differ from the demographically dominant groups and worldviews in the area?

Methods

I conducted 15 in depth semi-structured interviews (see Appendix A for the IRB certification and Appendix B for the interview protocol) with 12 landowners in the Southern Idaho-Northern Utah area. A total of 3 individuals volunteered for a second round of questions which probed further on their responses from the first round of interviews (see attached Appendix B for the follow-up interview protocol). A majority of participants, 10 interviewees, owned land or came from land-owning families in the Battle Creek Watershed, while the other two owned and ranched land nearby in Northern Utah. A total of 10 of the 12 participants identified as men, the remaining 2 identified as women. The age range of participants was 37-75, and the median age was 57. A total of 10 of the 12 participants were white and two were Native American. Participants were initially recruited with a letter explaining the project, which was sent out to a list of over 60 landowners taken from the Franklin County Appraiser's website. Individuals who were interested in participating were instructed to reach out to the team via phone or

email; due to restrictions imposed to combat the spread of COVID-19, all research had to be done virtually. I relied on telephone contact with participants, and though it was never used, gave the option for video communication software (i.e., Zoom) if desired, to conduct interviews.

All interviews were structured in a conversational style, allowing for a low-pressure and friendly environment for discussion. Each conversation was audio recorded. Interviewees were asked questions like “what does stewardship mean to you?” and “what does ‘living well’ mean to you?” Followed up with “how does this effect how you manage your land?” Open ended questions such as these allowed for interviewees to explain the things that mattered to them without probing specific relational values. After the initial round of interviews, a second round of interviews was conducted with three participants who were willing to elaborate on some of the themes that were present in their first interviews. The content of the second round of interviewees (see appendix for the follow-up interview protocol) offered more direct questions designed to probe specific relational values, such as “how do you think your management actions will affect future generations?” and “do your neighbor’s management actions effect you personally? How so?”

At the conclusion of each interview, I allowed for “snowball sampling”, or a chance for participants to suggest names and provide contact information for individuals they believe would be interested in being interviewed (Bernard, 2006). Snowball sampling resulted in the recruitment of 8 of the 12 interviewees.

Interviews were transcribed using the software Otter AI, a transcription service which utilizes artificial intelligence to not only transcribe audio, but also recognize tonal

differences to distinguish between speakers. Otter AI also learns from edited mistakes for more accurate transcription over time. The transcripts were then manually cleaned, then transferred to the qualitative analysis software NVivo for coding.

Klain et al., (2017) identified a suite of relational values on which I based my initial typology of codes, with the additional themes of reciprocity and trust as shown in
.

Further themes developed in my review of the transcripts that were also of importance, including managing land for the sake of future generations, as well as land management for the sake of self-sufficiency and the value of independence from the assistance and influence of others, specifically from government involvement.

Table 2.1 A typology of relational values based on Klain et al. (2017)

Relational Value	Definition
Community	The landscape contributes to the identity of those who live and work on it.
Health	The health of the individual or the health of the individual's family is somehow related to the landscape.
Identity	Strong feelings toward nature, including all the plants and animals as well as the landscape, that contribute to the identity of the individual.
Kin	A notion that plants and animals are part of a larger, more interdependent web of life.
Responsibility	The way the land is managed reflects a larger responsibility for both plants and animals as well as future generations.
Wild nature	Striving to protect wild places, taking responsibility for the fate of nature.
Other People	A responsibility for an individual's own impact on the land which could affect other people, particularly neighbors in the watershed.
Reciprocity	Human and nonhuman beings existing in relation to each other, each with its own needs that are respected. This

	includes the idea of ‘taking only what is needed’ and ‘making sure you leave enough behind that other beings also have what they need’
Trust	Confidence in the integrity of a relationship with someone of something

Results

As I characterized how interviewees spoke about these dimensions of relational values, particularly in the context of how they think about land stewardship, I organized how these individuals spoke of stewardship into three distinct themes and characterized relational values that arose as part of these three themes: 1) stewardship as important to the individual; 2) stewardship as it relates to surrounding social interactions and community involvement; and 3) stewardship that values the health of the landscape itself.

Stewardship and the Individual

Multiple participants spoke of a bond with the landscape and its stewardship that was unique to them as an individual and this bond has become a part of how they see themself, exemplifying the relational value of identity. Participant 3 said: “there's a lot easier ways to make a living. But it's kind of.… a genetic problem. It's … part of who you are a little bit, that …. you define yourself as a farmer.” Speaking of an ongoing process of developing a relationship with the land, Participant 7 said: “But I, a part of the land? Yeah. I mean, I always longed to be a little bit more connected to it.”

When asked what stewardship meant to them specifically, many of the participants spoke of the relational value of responsibility that they felt was bestowed up them to take care of the land. Participant 4 told me: “it just seems like the fact that I'm

entrusted with… not only the right, but the responsibility to take care of the land as best I can. It's… really important to me, the land is …. and to my family." When prodded further on the origin of this feeling of personal responsibility, participants spoke of their upbringing:

> *"Well, my father was a farmer, and rancher, and so everything we had, everything we did was associated with the land that we have for the farm... that's where I really developed a bond, or whatever you want to call it with, with land. With the…property that it's almost…sacred. The rights and the responsibilities you have" (Participant 4)*

> *"Well, I [was]… taught to just respect things and, and then just hard work. I think that hard work, working outside gives you … that respect that if you don't do good work…good things don't happen out there. So yeah, it's kind of my upbringing… you always want to leave it better than you found it and or try to fix anything you think is wrong with it. And that includes for human use, and or animal use." (Participant 7)*

Prioritizing Independence

Throughout several of the interviews, I also discovered a theme that runs counter to relational values: fierce independence and the desire for freedom in decision making when it came to the management of the land by the individual. Participant 6 said "I don't pretend to think that we should have control what the Tribe does with their private property, nor should they have control of what we do with ours." This sentiment was

echoed several times nearly verbatim. Further discussion with participants also revealed that landowners feared government overreach and the loss of freedom of choice when it came to their own land:

> *"Anytime that I see the government reaching out and saying that we can't do this, or we can't do that, or that, that … you're really… ruining the world when you're breathing and things like that. Or the cows are breathing or whatever, you know, yeah, I can see the government overreach has been… a real real problem for us, you know. And so I guess I am more of in favor of allowing the stewards of the land- those that are taking care of it, that they're living on it- to make those decisions." (Participant 3)*

Some also mentioned perceived mistakes of the past as a source of distrust of government involvement in land management decisions. One example of this would be the introduction of the Russian Olive tree (*Elaeagnus angustifolia)* by the National Resource Conservation Service (NRCS) as a bank-stabilizer in the early twentieth century, which has resulted in current struggles with the management of the prolific invasive species. Multiple participants mentioned how they valued self-sufficiency; part of the responsibility of land management to them is to create a living for themselves through proper management and production, reducing the need to rely on "government handouts."

A productive and healthy relationship with the landscape in this case may be built on the relational value of reciprocity, mentioned before as the co-existence of humans

and non-humans in which both have needs that are respected and therefore met in kind. Participant 3 said, “You take care of the land, and then it takes care of you.”

Several participants also mentioned valuing the solitude that comes with living in rural areas. Many valued having “breathing room” to live away from the “crowds” of nearby Preston and Logan. When asked of their concerns in regard to the development of the Boa Ogoi Cultural Interpretive Center, one participant mentioned that he did not want more people visiting the area and causing more traffic. Others spoke of concerns of increased population in the area as more people move to the Preston region to obtain space of their own, and further development of the site could be a sign of more building to come in the area:

> *“The big, the big worry I have that for the future and especially … of our land is … there’s going to be a really, really strong demand for housing and development. And I don’t want that. I want to be able to avoid that as much as possible. Once I’m gone, it’ll be up to my family. And then they may have … different goals. But right now, I see that the biggest threat to the land and the hardest decisions will be development issues.” (Participant 4)*

This desire to maintain the status quo was a theme that resonated with about half (7/12) of the interviewees. Many participants expressed discomfort with change from how things are, whether that be new structures being built, an increase in outside visitation to the area, or changes in how the land is being used and managed.

Stewardship and the Community

Though there were strong themes of independence and personal identity which were tied with the landscape, many participants found it necessary to manage the land in a way that was not detrimental to their neighbors, an example of the relational value "other people." Participant 6 responded "Well, I believe that the Tribe can do what they want to do, I don't think they need approval from the community, but I think they need a good working relationship with neighbors." When asked how their neighbors' management actions affected them personally, or how their own management actions affected their neighbors, multiple participants focused on invasive species management as a sort of responsibility or duty to their neighbors:

> *"My things affect those around me as well, you know… you want to try to do things that don't, you know… noxious weeds, or weeds of any sort… they don't go across the fence and [effect] your neighbor…those types of things … can be an irritant for people" (Participant 3)*

Another frequent concern involving land stewardship that arose were water concerns, particularly the quantity of water available through the landscape. When asked about how they felt about land restoration objectives at the Boa Ogoi Site, specifically the introduction of beaver (*Castor)* to the riparian area, multiple participants voiced worries about river fluctuations that could potentially be harmful to their interests:

> *"What do you have to do for that [beavers returning] is the question?…What does that involve? If you're looking at having some slower moving waters someplace…maybe building some kind of dams*

> *or something. I don't know. But that rivers got to flow; you know" (Participant 8)*

Combined with the previously mentioned fear of government overreach, the relational value of "responsibility" embedded within land stewardship that doesn't negatively affect neighbors is consistent with the desire for independence on the landscape. Participants seemed to suggest a system of self-governance–autonomy in how they manage their own land in a way that they see fit– which loosely aligns with the goals of the community as a whole. When asked if the community should be involved in the development of the site stewardship plan at Boa Ogoi, most said community involvement would be a nice gesture, but not something that should be required of the Tribe:

> *"But, you know, at the end of the day, they own the land, and as long as it's legal what they're doing… I can be a little upset about it, but … I'll defend their right to do what they want on their land and as much as I would hope they would defend my right to do what I would like on my land as well" (Participant 12)*

Distrust of "outside" involvement–which I interpret as individuals who aren't permanent residents of the community or who belong to social groups that are different from the dominant white, LDS culture–seemed to extend to the Tribe, possibly suggesting their recent acquisition of the site and renewed presence in the area gives them an "outsider" status (despite NWBSN oral traditions that describe how the Tribe used the area as winter camping grounds for multiple generations (D. Parry, 2020, personal communication)). This also could suggest that the possible benefits of overall watershed restoration, such as improved water flow, water quality and riparian habitat, could be

overshadowed by fear of the loss of freedom to make individual land management decisions. Though one participant said this changed after his meeting with some Tribal Council members: “I didn’t feel like they were wild eyed, crazy folk, you know, so I think that things will work out good there.” I recognize both the implicit racism in this statement and the landowner perceiving the Tribe as competent landowners.

Further, comments from some participants seemed to suggest that a change in the overall historical narrative of the site could somehow change the community structure in the area. Others seemed to fear more potential “forced” changes to their worldview or ideologies. This was most apparent when asked what they thought about changes to the historical monument, specifically to the plaque at the site. The original plaque states that the massacre was a “battle” fought over “hostile attacks on settlers and emigrants.” It also labels all those who died, including women and children, as “enemy combatants”. Largely one-sided, the plaque disregards the white settler encroachment on traditional native food systems (i.e., settlers hunting wildlife and establishing private property boundaries, often with fences that excluded NWBSN access to traditional territories) that resulted in petty food theft to ward off starvation.

For some participants, fear of change seemed to overrule the desire to clarify the details of the event and provide a NWBSN perspective on the event in interpretive materials:

> *“I mean it. It says right on there that they had trouble after trouble after trouble with them stealing livestock and I can’t ‘member if it says…[if], they had killed people or whatever, but they weren’t the best of neighbors either…but you don’t hear that, you don’t ever hear that*

> *part of it. All we hear is that the Indians were just playing victims and they were just sitting there doing nothing and they just got massacred." (Participant 8)*
>
> *"So we've tried to put that [clarification on the historical narrative] on the plaque. And I talked to [a leader of the Daughters of the Utah Pioneers, an LDS affiliated group [1]][who] was really worried that we were somehow changing history. And she says "well, if we change this one, maybe other people might want to start changing plaques, and we can't afford that." And so, she didn't want to do it." (Participant 1)*

In contrast to voices who may have seemed hesitant or distrustful of change in land management as well as perceived potential conflicts with neighbors, multiple participants offered that they saw no potential issues arising with changes in stewardship at the site. Participant 3 said: "I've heard him [the Tribal leader] talk of changing roads, you know, and stuff, which that could actually be a really good thing, if they put it in the right place, you know, because things aren't as good as they could be…" Regarding noxious weeds, the same participant said "we're all kind of in the same boat with it, you know?" The majority of participants (10/12) mentioned that they saw the community as a whole as being supportive of the NWBSN's site plans, some even offering to volunteer if the opportunity arose.

Stewardship and Nature

[1] Personally identifying details have been removed.

When asked what stewardship meant to them, most individuals focused on the individual or community benefits of land stewardship. Whether it was a personal responsibility, responsibility to community or neighbors, one for future generations, or a relationship with the land built upon reciprocity or individual benefit, most participants largely spoke of economic and social aspects of stewardship.

Apart from stewardship as an individual endeavor and stewardship as a responsibility to the community, a third and less prevalent theme that emerged was stewardship through land management decisions that valued the relational value of "wild nature". Five interviewees spoke of the importance of restoring the landscape back to native plants and animals, as well as preserving areas minimally impacted by development. Participant 7 said "Open land, is… always going to be getting smaller and smaller, I think…. Any ways we can preserve either farmland or natural land that hasn't been farmed is always valuable."

This seemed to be separate from relating to the landscape as a part of one's own identity– mentioned above as personal responsibility and independence seeking– but to be more motivated by a deeper and more meaningful bond with the land as something separate than the individual and yet having needs that can be met through land management practices. The relational values of "wild nature" (striving to protect wild places and taking responsibility for the fate of nature) as well as the relational value of "kinship" with nature (the notion that plants and animals are part of a larger, more interdependent web of life) could be applied here.

"We… [the landowner and their family] [have]also done a really extensive project with several federal agencies on getting rid of [the

> *noxious weed] Medusahead (Taeniatherum caput-medusae) and reseeding the range back to just native grasses and plants… one of the things we've done is we've stopped all use of, ...four-wheel drives, dirt bikes, etc., except in just a few selected spots. When we got the land, it was being used quite a bit by four wheelers and dirt bikes for recreation, and we have stopped all of that. So as a result, I think we've done a pretty good job on erosion" (Participant 4)*

> *"Basically let them [areas of pastureland] go fallow, and then make a wildlife habitat. Okay, and so we've seen some of those get pulled out of CRP [Conservation Reserve Program, a USDA program designed to remove environmentally sensitive land from agricultural production]. And then some places are getting changed into different programs to provide better habitat and a better seed mix for different wildlife." (Participant 10)*

> *"It's agriculture land [in the broader region]. That's what it has been since it was broke up [settled]. And that's what it continues to be. Yeah, I think our practices are a little better, environmentally and such" (Participant 6)*

Though present, stewardship values for the sake of "wild nature" or a "kinship" with nature were far from prevalent in the interviews— only 3 of 15 interviews mentioned these values. Participant 11, voicing their opinion of stewardship in the area:

"There are certain parts of Cache Valley that are like pristine, and they look nice. And that's not one of them."

Discussion

An individual's relationship with the land can contain unique preferences, principles, and virtues associated with its overall stewardship. The results of my analysis indicate that the majority of interviewees held values and relationships to stewardship of the landscape in ways that are consistent with the conservative, Mormon culture profile based on Franklin County demographic characteristics. My thematic organization of relational values relevant to how people think about land stewardship connects to the conservative worldview theorized in cultural cognition.

The relationship of the individual with stewardship of the landscape has similarities to held values of a conservative worldview. As mentioned before, conservatives are more likely to value independence and governance at an individual as well as a local level. Study participants frequently mentioned the desire for freedom to make land management decisions for themselves, citing government overreach and the encroachment of development as threats to their way of life. All participants acknowledged various environmental concerns, such as issues with water quality and quantity, encroachment of invasive species, and erosion. As mentioned before, higher environmental concern is often present in the Mormon Culture Region, yet the highly degraded state of the Battle Creek Watershed when purchased by the Tribe in 2018 points to a previous lack of sustained coordinated action for water quality improvement and invasive species removal.

Values of stewardship as a responsibility to neighbors and the community is also consistent with Mormon Culture, which emphasizes “dominion over nature”, or stewardship of the land and plant and animal species that minimizes negative effects– such as uncontrolled spread of invasive species– to the health or interests of others (Brehm, 2006). Interviewees expressed a degree of trust that their neighbors would “do the right thing”, while also acknowledging their own management efforts that serve to avoid conflicts with neighbors, such as the management of invasive plant species and consistent upkeep of cattle fencing. However, most interviewees distrusted those seen as “outsiders” being involved in local affairs. This suggests a possible barrier as a change in land management objectives at the Boa Ogoi site could possibly threaten the status quo of the upstream watershed, which could lead to resistance by neighbors.

Although much habitat and water quality improvement can be done on site at Boa Ogoi, it is likely that water quality will continue to be an issue until sources of sedimentation and pollution are abated upstream in the Battle Creek watershed. Such abatement likely requires the creation of riparian buffers and fencing to prevent cattle from trampling the creek. Such efforts to protect the creek may be seen as a threat to the status quo of how ranching is currently practiced. Given the demographics of those interviewed (10 of the 12 participants interviewed were white, 10 of the 12 participants were males) this could serve as an example of the “White Male Effect”, or the tendency for conservative white males to deflect threats to the status quo and reject behaviors and practices seen as noble which could possibly be damaging to society or the environment. This effect is likely playing out in the removal of beaver dams with the use of dynamite: “And then we'd have a professional come in, and maybe blast the dam with dynamite and

different things" (Participant 11). Another example would be negative environmental effects stemming from cattle ranching, such as allowing cattle to graze in riparian areas, which has proven to damage water quality and wildlife habitat. Participant 3 spoke of concerns for future environmental policy that might affect their cattle ranching activities in the area, specifically feeling that the industry is being blamed for water and air pollution in the area which could lead to regulation that they see as unfair:

> *"Yeah, anytime that I see the government reaching out and saying that we can't do this, or we can't do that… that you're really ruining the world when you're breathing and things like that. Or the cows are breathing or whatever…I can see the government overreach has been been a real problem for us… so I guess I am more of in favor of allowing the stewards of the land- those that are taken care of it, that are living on it- to make those decisions rather than having it come from… the centralized planning and government coming to help us to all of our problems, or identifying problems that we don't see as problems." (Participant 3)*

Landowners and managers living near Boa Ogoi rarely mentioned the intrinsic value of nature. Interviewees largely focused on the socio-economic features of land stewardship, suggesting that values of stewardship built upon kinship towards nature or preserving nature for its own benefit (intrinsic value) are less of a priority for this group than the instrumental value of the land, i.e., deriving income from ranching and agriculture. Chan et al. (2018) mentions the ambiguity between relational values (particularly relational values) and instrumental values, arguing that though at times they

can both be present, they are in fact distinct. The author gives the example of a tree planted to commemorate a significant event, which would be valued relationally, that also provides shade to the planter, which would be an instrumental value (Chan, Gould, and Pascual, 2018).The results of my study at Boa Ogoi also reinforce Peçanha Enqvist et al.'s (2018) conclusion that stewardship involves a wide range of interpretations at the individual level. The author notes that the concept of stewardship can therefore be navigated through the concepts of care, knowledge, and agency (Peçanha Enqvist et al., 2018). In the Battle Creek region, I argue that understanding these underlying motivations for stewardship can assist in communications between NWBSN land managers and neighboring landowners.

Message Framing for Restoration Objectives

Cooperation with nearby landowners will be essential for the Boa Ogoi restoration efforts to become a catalyst for watershed-scale restoration on a longer time horizon. Many of the NWBSN's restoration goals, such as removal of invasive species (e.g., Russian Olive) and restoration of the riparian area (e.g., diverting a creek from an existing ditch to instead spread across a field) can be met independently of their neighbors; however, long-term success in improving water quality and supporting endemic biodiversity may hinge on other landowner's willingness to implement better practices of invasive species removal on their own land, as well as water quality improvement upstream from NWBSN land.

In communications with neighbors, the Tribe and their restoration team could frame their messages similar to what Kahan (2010) recommends: present information in a

manner that affirms the values of their audience and in such a way that the acceptance of that information does not risk alienation from the groups with whom the audience identifies

For example, conservatives tend to support policies that do not impede the individual's ability to commercially use natural resources. I have demonstrated that landowners in the Battle Creek Watershed highly value independence from perceived "government overreach" and influence in local affairs from outside sources. Yet, my analysis shows that landowners in the Boa Ogoi area hold relational values of responsibility for the management of the land for the sake of their own identity, future generations and other people in their community. Messaging that focuses on these values which showcase the benefits of restoration practices, such as the removal of invasive plant species to control the spread to their neighbor's land, as well as the preservation of native species via riparian buffers for the benefit of future generations, are good examples of this.

As mentioned before, the issue of polarization is not the rational capacity for decision making of the individual, but the potential "irrationality" of the masses when that information competes with their worldview (Kahan, 2015). Proper message-framing can dispel the "tragedy of the risk-perception commons"–the dissonance in rationality between the individual and the collective– and can foster a more open and friendly atmosphere for collaboration (Kahan, 2011). Kusmanoff (2020) suggests emphasizing what matters to a target audience while carefully framing language that considers "how things are said" along with "what is being said" (Kusmanoff et al., 2020, pg. 1123). For example, studies have shown that focusing on the benefits of a behavior change rather

than the costs resulted in increased engagement and behavioral intentions (Gifford & Comeau, 2011). At Boa Ogoi, this could mean justifying the construction of the Boa Ogoi Historical Cultural Interpretive Center and the restoration of its surrounding lands as a process that could strengthen the community's economy with anticipated results such as bringing additional tourists to Franklin County with the associated economic benefits to local businesses.

Kahan (2010) recommends recruiting experts who are respected members of the targeted community to assist in communicating information; this validates messaging through association because individuals perceive these experts to have similar values as they do, making it more likely that they will accept the given information. Emphasizing the acceptance of a behavior change as a social norm has shown to help promote a further change in behavior (Kusmanoff et al., 2020). In the Battle Creek area, respected leaders and experts could include local church leaders, prominent ranchers, law enforcement, and elected county officials. The support of respected individuals in the Franklin County area could go a long way to gaining support and participation in large-scale restoration actions.

Finally, studies have shown the tendency for individuals to value a something higher if they own it–this is referred to as the "endowment effect" (Kahneman et al., 1990). In the southern Idaho area, the conservation organization "The Sagebrush Steppe Trust" similarly frames messaging of their conservation easement process around the emphasis of "private land" with easement agreements that "conserve the natural and traditional values of the land" (sagebrushlandtrust.org, accessed July 27, 2020). At Boa Ogoi, recognizing the increased value of the landscape through ownership could inform

message framing efforts, particularly by implicitly acknowledging that participation in collaborative restoration efforts with the NWBSN will not result in loss of agency in land management, discussed above as a common concern with interview participants.

Recommendations for Future Research

Further research is needed to determine the extent of the differences in individual relational values and values that are consistent (or not) with the dominant groups and worldviews in the Battle Creek watershed. Characterizing differences in relational values of the Tribe and neighboring landowners would require further interviews specifically with members of the NWBSN. This could provide additional insight into facilitators and barriers to collaborative management born from differences and similarities in value systems.

As mentioned previously, studies have shown that women tend to have more concern for environmental risk than men (Shi, 2015). I suggest that differences in relational values between genders in the region should be carefully evaluated, which could build a more complete picture of the relational values of land stewardship in the Battle Creek Region.

As mentioned above, people are often guided by previously held beliefs, values, and desired conclusions which can be influenced by the groups and worldviews they are subscribed to (Newman et al., 2018). If used, the message-framing suggestions in this thesis research could potentially be effective in science communication between the Tribe and neighboring landowners. The effectiveness of these messaging recommendations could also be studied empirically– I suggest methods similar to Myers et al.'s (2012)

experiment with climate change messaging, where participants of a representative sample of the dominant demographics of Franklin County would be randomly assigned to read one of three different messages, each emphasizing different dimensions of restoration in the area. One of the messages would emphasize the scientific benefits, one could potentially emphasize the economic benefits, and one would emphasize the benefits of restoration that would be consistent with the relational values characterized in this thesis research. A survey could then be administered to quantitively assess the participants reaction to the message, potentially gauging the reception of scientific information built around these relational values of stewardship and potentially assessing the influence of the messaging on behavioral intentions, which could include volunteering to assist in restoration efforts on the Tribe's land or creating riparian buffers on their own land.

Conclusion

This research uses a novel approach in synthesizing relational values with cultural cognition in the context of ecological restoration. This case study explores landowner relational values pertaining to stewardship in the Battle Creek watershed of Franklin County, Southern Idaho, yet has implications for other regionally relevant environmental issues in the Intermountain West. By providing a basic approach to utilizing relational value data in restoration message-framing, this research suggests that land managers can foster collaborative relationships with individuals through communications that minimize risk of alienation of those individuals from groups and worldviews that they subscribe to. The land managers who I interviewed expressed strong relational values of identity (i.e., feelings about nature are a part of who someone is and how they live) while also

prioritizing independence and self-sufficiency through the management of the landscape in ways that I infer could be consistent with the dominant LDS faith in the region.

However, relational values such as the responsibility of land stewardship that considers future generations and other people in the community were also strongly present, giving credence to the message-framing suggestion that by framing restoration objectives as a collaborative effort of benefit to the community or to an individual's children or grandchildren, a discomfort with a change to the status quo or a fear of loss of independence could possibly be circumvented. Thus, through the careful characterization of the values and worldviews involved in these groups, I recommend message-framing strategies that incorporate relational values of stewardship to inform communications between the Northwestern Band of Shoshone Nation and their neighbors to potentially cultivate effective working relationships, which could result in larger-scale watershed restoration.

I argue that message-framing strategies utilizing relational values could also be valuable in contexts outside of this specific case study, where characterizing stakeholder relationships with land stewardship could lead to science communication that is more effective at encouraging a change in behavior. This research points to the need to understand and leverage the worldviews and relational values of landowners to increase the likelihood of achieving stewardship goals that require cross-boundary cooperation, e.g., improving water quality. An example from this case study would be the tendency for conservative individuals to hold individualistic worldviews and to resist being told what to do by those who they view as 'outsiders' to their immediate community. These individuals could potentially respond in a more favorable way by communication that

instead focuses on relational values that may also motivate their behavior, such as the desire to be a good steward of the landscape for the benefit of their children, future generations, and others in their community.

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CHAPTER III: INFORMING KNOWLEDGE WEAVING FOR ECOLOGICAL RESTORATION THROUGH CHARACTERIZING RELATIONAL VALUES ASSOCIATED WITH LOCALLY SLIENT SPECIES

Introduction

Indigenous and local knowledge systems complement western scientific knowledge and enhance knowledge and governance of social-ecological systems (Tengö et al 2017). The co-development of alternate knowledge systems to complement Western Scientific Knowledge can enhance and enrich understanding (Tengö et al. 2014). With a host of complex environmental issues stemming from anthropogenic activity, a need has arisen for user-inspired, useful solutions that can inform environmental policy (Raymond et al. 2010).

Applying distinct knowledge systems to natural resource management decisions is enriched by mutual understanding of the values and perspectives of the individuals who hold the knowledge itself (Sheremata 2018). These values can stem from cultural practices or lived experience and can inform interactions between the individual and their environment (Allen et al. 2018). This has led some social scientists to suggest that those who create environmental policy should consider the intimate relationships between people with nature that are distinct from its instrumental utility (Chan et al. 2016).

In this chapter, I bring together academic literature on knowledge weaving (Tengö et al. 2017; Hill et al. 2019) with the emerging field of relational values in conservation science (Chan et al. 2016, 2018; Klain et al. 2017). I use a case study approach with a focus on characterizing relational values and applying local knowledge to identify potential barriers and opportunities for collective stewardship efforts in the Battle Creek

Watershed of Southern Idaho, where the *Boa Ogoi Historical Site* is located. Using data from semi-structured interviews that I have conducted with resident landowners of the area, I identify local knowledge and preferences pertaining to specific species, including: elk (*Cervus Canadensis*), Mule deer (*Odocoileus hemionus*), Russian olive (*Elaeagnus angustifolia*), and beaver (*Castor*). I also illustrate a framework for weaving knowledge and preferences among local residents with those of tribal landowners and input from scientists in order to better inform the *Boa Ogoi Historical Site* stewardship plan. This stewardship plan is part of the Northwestern Band of the Shoshone Nation's efforts to build a cultural interpretive center and restore endemic species at this site.

Theoretical Context

Weaving Knowledge Systems

Tengö et al. (2017) defines knowledge as adherence to "a body of propositions, whether formally or informally, that are routinely used to claim truth" (p. 18). Knowledge is often context-specific; knowledge systems can be of great use to those who hold them but may create confusion if taken out of the context in which they were created (Tengö 2014). Further, knowledge is often passed down over generations in order to inform the decisions and actions based on wisdom of past learning (Cruikshank 2012).

Weaving knowledge systems requires collaboration among stakeholders that respects the integrity of each knowledge system. Further, due to the "scope, complexity, and uncertainty of global environmental problems" (Raymond et al. 2010, p. 1766) a carefully considered response at the local, regional, national, and global levels in the form of multi-stakeholder collaboration may prove vital to finding solutions to these problems.

Historically, Western Scientific Knowledge (WSK) has often overlooked local knowledge pertaining to potential solutions to environmental problems. Inadequate involvement of local stakeholders in environmental governance not only neglects to acknowledge the utility of their own unique knowledge, but can also perpetuate asymmetries in power (Rathwell et al. 2015.). The co-production of knowledge– as opposed to data collection and analysis by independent researchers– could lead to management decisions that result in more equitable solutions for all parties involved rather than relying on only one type of knowledge (Tengö et al. 2017).

Three types of knowledge systems are of particular relevance to my research: local knowledge (LK), indigenous knowledge (IK), and WSK. Weaving these knowledge systems supports multiple perspectives (Tengo et al. 2017) and has the potential to expand restoration and conservation actions (Raymond et al. 2010).

"Place-based observations," embedded in local and indigenous knowledge, offer insight into how local residents understand environmental systems (Rathwell et al. 2015). In contrast, WSK may be less relatable to local residents because it identifies general patterns that are initially published in academic journals, but considerably less knowledge is readily translated into the vernacular of broader audiences via mediums such as magazines, documentaries, books, and radio. Though these methods of communicating scientific findings can be effective, there are other ways to transfer knowledge and wisdom to others: Local Knowledge (LK), as well as Indigenous Knowledge (IK) can be passed down generationally through storytelling, rituals, traditions, and art (Hill et al. 2020).

Indigenous Knowledge is embedded in cultural groups that acquired this knowledge from multiple generations learning from inhabiting a region. In many cases, IK embodies thousands of years' worth of wisdom (Weatherford 1988). Like scientific knowledge, IK can include observations of change, the gathering of data, and experimentation to test ideas and achieve results (McElwee et al. 2020). While IK is undeniably important, my research will focus on LK while proposing recommendations for knowledge weaving.

LK "refers to the informal, lay, personal, often implicit or tacit, but possibly expert, knowledge held by land managers involved in environmental decision making (Raymond et al. 2010, p. 1767). Though it can be multi-generational, LK is not limited to specific groups or inhabitants who have ancestral roots to an area (Tengö et al. 2017). Like IK, LK can pertain to land management practices, invasive species management, and agricultural methods (Joshi et al. 2004). For example, LK has been used to address agricultural pollution, road construction, grazing, water diversion, and destruction of riparian areas by livestock (Kauffman 1997). Such studies illustrate that local farmers and ranchers understand how changing local management and climate regimes and long-term dynamics of key plant species influence variation of vegetation properties (Knapp and Fernandez-Gimenez 2009). Like WSK, LK utilizes observation, data collection, and experimentation to solve problems at a local scale (McElwee et al. 2020). Finally, LK can inform how its holders relate to the world around them, such as valuing one plant species over another based upon specific knowledge of its uses. Local knowledge is based on how people interact with, manage, value and learn from their environment. Identifying

and operationalizing these human-environment relational values can allow for increased recognition and validation of LK systems (Schulz and Martin-Ortega 2018).

Five Tasks for Weaving Knowledge Systems

So far, I have given an overview of Local Knowledge systems, as well as their strengths and applicability to modern "real world" environmental problems, but how can environmental managers effectively bridge Western Science with alternate systems such as Indigenous or Local Knowledge? Tengö et al. (2017) suggests focusing on five key tasks: mobilize, translate, negotiate, synthesize, and apply. I briefly describe each.

Mobilize

Collaborators can create mobilization processes that respect and understand validation systems within the communities and knowledge systems with which they are working such as facilitating community-led data collecting exercises which clearly and respectfully utilize methods within the knowledge systems in question. Further, any knowledge or data collected must be "clearly and recently" legitimated by representatives of that knowledge system (Tengö 2014). Finally, as knowledge can be possessed within alternate mediums such as poems or rituals, officials or "elders" of that community should be consulted in order to adequately address context (Tengö et al. 2017).

Translate

Communication among all parties should be done with "language and terms that can be understood by all actors and clarifying knowledge claims or criteria of credibility in a respectful way" (Tengö et al. 2017, p. 20). Further, complex jargon should be

avoided; any clarification of terms or information should be done in a patient and non-condescending way. The purpose of the application of the knowledge should be clearly represented and adequately translated for all parties. Contributions need to be mutually understood. All parties must be respectfully addressed and engaged (Tengö et al. 2017).

Negotiate

In order to allow for functional interaction between knowledge systems, all knowledge needs to be represented usefully and respectfully (Tengö, 2014). Spokespeople from stakeholders must be addressed on how best to utilize information to create the best and most respectful solutions to problems (Tengö et al. 2017). The most equitable as well as efficient results arrive when the integrity of all knowledge systems is respected and honored (Johnson et al. 2016). Further, by allowing for co-creation of solutions, the issue of inequity of power begins to be addressed in a lasting and meaningful way; ideally, all parties involved arrive at an outcome knowing that they played an equal and important role (Tengö et al. 2017).

Synthesize

Building on negotiation, synthesis is the shaping of the accepted knowledge bases for a particular purpose (Tengö et al. 2017). This is when a mutual understanding of co-produced knowledge can be utilized, and a particular policy action can be recommended after extensive review between researchers and representatives of the knowledge systems involved (Tengö 2014). The key to reversing a legacy of mistrust of Western Science by IK and LK knowledge holders–such as the use of data collected from Native Americans for a purpose other than agreed on like the case of the Havasupai Tribe vs. Arizona State

University (Drabiak-Syed 2010)– is active participation and the maintenance of mutual respect (Johnson et al. 2016)

Apply

The final step to properly bridging knowledge systems is application. After information pertinent to the focal issue(s) is properly translated with respect to context and intent, its meaning properly negotiated and understood and applied to a planned course of action, it can be finally put to use in an attempt to solve a real-world problem (Tengö et al. 2017). Application should be relevant for all stakeholders involved; this can look many different ways including a policy, a published study, or "working knowledge" that communities can use for their own governance (Tengö et al. 2017). Like Western Scientific methods, an applied method should be properly evaluated and discussed by members with different knowledge systems, and information collected should be used to further strengthen the system itself.

This five-step framework has been utilized successfully elsewhere. The Kimberley Indigenous Saltwater Science Project (KISSP) sought to integrate IK with WSK to improve coastal and marine environments in the Kimberley, Australia region. Using this framework, researchers were able to assist in establishing an ongoing, regional, Indigenous-led advisory group that not only offers knowledge sharing and collaboration, but allows for Indigenous decision-making power and influence in the region. Further, KISSP has provided for scientific-training and employment for Indigenous peoples in the region (Tengö et al. 2021). Another successful example of a LK and WSK weaving process is at the Valée-du-Richelie Municipalité Regionale de

Comté (MRC) in Quebec, Canada. In this region, researchers collaborated with local farmers, land-use planners, politicians, and NGO's to gather knowledge for collaborative processes to work toward Montreal's goal to preserve 17% of land for greenspace (Norström et al. 2020).

This research (as well as the previous chapter) acts as a process of mobilization– the first step of the framework– by identifying potential barriers and opportunities to collaborative restoration in the area. As my research demonstrates, an analysis of local relational values can be useful in the knowledge mobilization process because it clarifies local relationships with the landscape as well as other stakeholders. My research seeks to fill a gap in the empirical literature regarding the use of relational values in the knowledge weaving process, as well as serve as a further proof of concept for the initial steps of knowledge weaving. I argue that characterizing relational values as part of knowledge mobilization could help parties to avoid misunderstanding and create stronger working partnerships. I further argue that understanding the underlying values and perspectives of knowledge system holders regarding how they relate to land and natural resources could increase the likelihood of successfully working through all five knowledge weaving tasks to achieve restoration goals.

Relational Values

Relational Values can be defined as "values linking people and ecosystems via tangible and intangible relationships to nature as well as the principles, virtues, and notions of a good life that may accompany these" (Klain et al. 2017, p. 1). Eudemonic values, or the "notion of a good life" fall within the realm of relational values; living a

good life on a landscape often involves being a “good steward of the land” or a “good farmer” (Allen et al. 2018). These values also pertain to care, as well as sense of place, which is the meaning associated with or attachment to a particular setting (West et al. 2018). An individual’s relationship with the land itself contains preferences, principles, and virtues associated with its care, or overall stewardship (Chan et al. 2016).

Identifying the values of diverse stakeholders is crucial for environmental management (Chan et al. 2016). Conservation social scientists have traditionally viewed how humans value nature through two overarching lenses: instrumental and intrinsic values (Allen et al. 2018). Instrumental value relates to nature as a means to an end. In the ecosystem services literature, the instrumental value components of ecosystems are often quantified as monetary values, which can be problematic (Jax et al. 2013). Environmental policy decisions based on instrumental values are often driven by economics, such as managing for maximum sustainable yield for a timber harvest, which can overlook crucial dimensions of how nature is important to people that are not appropriately expressed in monetary terms, such as preserving a grove of trees that is considered sacred by a culture (Chan et al. 2018).

In addition to instrumental values, intrinsic values are embedded in how humans value nature (Stålhammar and Thorén 2019). Batavia and Nelson (2017) contend that the field of conservation is premised on intrinsic values, arguing that there are non-human parts of nature that are good and deserving of protection, regardless of their instrumental or economic value. Environmental policies based on intrinsic values can be heavy handed and prescriptive, relying on “command and control,” such as restricting resource extraction activity in a certain area to preserve habitat for a threatened species or

removing residents of an area designated as a protected area or park. This can sometimes result in resistance from individuals who value an area more for its instrumental than its intrinsic worth (Allen et al. 2018).

Instrumental and intrinsic values fail to address deeper, intimate human-environmental relationships, which can be anthropocentric, yet not instrumental, such as valuing a site as sacred because of past events that happened there, like a battlefield or the locations of annual religious ceremonies (Stålhammar and Thorén 2019). To further understand these relationships with an eye towards environmental management decisions that benefit people and ecosystems, social scientists have turned to a third class of values in the conservation science literature: Relational Values.

The concept of stewardship plays a vital role in understanding relational values that influence land management choices. Stewardship can be broken into three distinct parts: care, knowledge, and agency: care for the land requires knowledge and the agency to apply it (Peçanha Enqvist et al. 2018)). Meaning can also be attributed to the use of the word "stewardship" itself. Peçanha Enqvist et al. (2018) explains that the word can have four different meanings. The first is based on ethic, or perceived duties and obligations. This is how one should relate to one's environment based on their own moral principles of right and wrong. The word can also be used in a motivational sense; the attitudes, traits, and predispositions that motivate people to participate in pro-environmental behaviors. These are most commonly instrumental interests, as well as emotional and social attachments. The third use of the word is the most common, which is based on an action. In this sense, stewardship is a reference to a particular activity, practice, or initiative engaged in by particular actors. This could be, for example, an action intended

to accomplish an. The final use of the word “stewardship” pertains to a specific outcome: this would be the pursuit or achievement of a set of results that are perceived to be desirable, such the reduction of erosion through riparian restoration (Peçanha Enqvist et al. 2018).

The goal of this research is to assess relational values relevant to weaving knowledge systems relevant to ecological restoration. My research advances understanding of the relational values held by land owners and managers in the Battle Creek Watershed Region. I focus on how these local residents perceive a subset of species which ought to be incorporated into the stewardship plan for this site. The following section introduces the historical context that has led to the present social and ecological conditions of the area surrounding *Mo-so-da Kahni*, Shoshoni for Home of the Lungs, along *Boa Ogoi*, which translates as Big River and refers to the Bear River.

Study Context: Boa Ogoi Historical Site

In January of 1863, U.S. cavalry led by Colonel James Connor attacked a band of Shoshone camped by a hot spring near the modern-day town of Preston in Southern Idaho. Spurred on by vague accusations from local Mormon settlers, Connor was seeking retribution for petty theft and scattered violence thought to be attributed to the Northwestern Band of Shoshone Nation (NWBSN) who wintered in the area. The band, led by Chief Sagwitch, lost nearly 400 men, women, and children during this massacre, making this one of the largest mass killings of native peoples in American history (Madsen, 1985) The incident was labeled by settlers in the region as the “Battle of Bear

River" for nearly 150 years, lending its name to local landmarks such as "Battle Creek" and "Battle Mountain" (Madsen 1985).

In 2008, the NWBSN purchased the site of the massacre. Ten years later, the NWBSN purchased an additional 500 acres of the surrounding land (see Figure 3.1) with the intention of creating the *Boa Ogoi Cultural and Interpretive Center*, a state-of-the-art building designed to educate visitors and to pay respects to those who died during the massacre (Parry 2019). The NWBSN tribal council also came up with the idea to restore this customary winter encampment site to pre-1863 conditions (D. Parry personal communication 2021). Leaders of the tribe, in conjunction with Utah State University professors and students, have been formulating a land stewardship plan with this intention.

Figure 3.1 *Boa Ogoi memorial site (blue pin) and surrounding acreage (bounded in yellow).*

Restoring the land will prove to be a daunting task, given changes in climate and land use in the years since the Bear River massacre. As in many similar regions in the Western U.S., encroachment of invasive species, draining wetlands, channelization of streams into irrigation ditches, poorly timed livestock grazing at excessive levels, removal of native vegetation, construction of roads, and other activities have affected water and soil quality and greatly altered vegetation (Kauffman 1997). Large tracts of habitat, particularly pertaining to the riparian area at the site have been damaged, effecting many species that serve as traditional native food sources. The NWBSN aim to embed their culture into how they manage this site, which includes restoring these traditional food sources, e.g., endemic trout and chokecherries. They acknowledge that use of the land by upstream landowners impact their property, particularly impacts to water quality. The Tribe is open to opportunities for collaboration on restoration objectives with nearby landowners to achieve their own ecological restoration goals.

Methods

I conducted and transcribed in-depth semi-structured interviews (see attached appendix for my interview protocol) with 12 landowners in the Southern Idaho, Northern Utah area. The transcripts were then coded and analyzed with a typology of relational values as well as emergent species-specific themes.

A total of 10 of the participants owned land or were part of land-owning families in the Battle Creek Watershed, while the other two own and ranch land nearby in Northern Utah. Participants were initially recruited with a letter explaining the project, which was sent out to a list of over 60 landowners taken from the Franklin County

Appraiser's website. Individuals who were interested in participating were instructed to reach out to the team via phone or email; due to restrictions imposed to combat the spread of COVID-19, all research had to be done virtually. I relied on telephone contact with participants, and though it was never used, gave the option for video communication software (i.e., Zoom) if desired, to conduct interviews. All interviews were structured in a conversational style, allowing for a low-pressure and friendly environment for discussion. Each conversation was recorded. At the conclusion of each interview, I allowed for "snowball sampling", or a chance for participants to suggest names and provide contact information for individuals they believe would be interested in being interviewed (Bernard 2006). Snowball sampling resulted in the recruitment of 8 of the 12 individuals that I interviewed. Participants were asked questions ranging from their views on land stewardship to their perceptions and experiences with certain species that could potentially be of importance to the Boa Ogoi site restoration plan.

Interviews were transcribed on Otter AI, a transcription software which utilizes artificial intelligence to not only transcribe audio, but also recognizes tonal differences to distinguish between speakers. Otter AI also learns from edited mistakes for more accurate transcription over time. I cleaned the transcripts to ensure their accuracy, then imported them into the qualitative analysis software NVivo for coding. I coded all transcripts to better understand relational values among my interviewees.

Klain et al. (2017) identified a suite of relational values on which I based my initial coding typology, to which I added the themes of reciprocity and trust. These types of relational values and their definitions are included in Table 3.1.

Table 3.1 A suite of relational values from Klain et al. (2017)

Theme	Definition
Community	The landscape contributes to the identity of those who live and work on it
Health	The health of the individual or the health of the individual's family is somehow related to the landscape
Identity	Strong feelings toward nature, including all the plants and animals as well as the landscape, that contribute to the identity of the individual.
Kin	A notion that plants and animals are part of a larger, more interdependent web of life
Responsibility	The way the land is managed reflects a larger responsibility for both plants and animals as well as future generations.
Wild nature	Striving to protect wild places; taking responsibility for the fate of nature
Other People	A responsibility for an individual's own impact on the land which could affect other people, particularly neighbors in the watershed
Reciprocity	Human and nonhuman beings existing in relation to each other, each with its own needs that are respected. This includes the idea of 'taking only what is needed' and 'making sure you leave enough behind that other beings also have what they need'
Trust	Confidence in the integrity of a relationship with someone or something

After reviewing each interview transcript, I identified emergent themes regarding certain species relevant to the site, leading me to also make codes that were species-specific. These included: beaver, native plant species, Russian olive, Mule deer, elk, and noxious weeds.

Results and Discussion

Interviewees frequently discussed concerns related to four particular species: Russian olive management, desire to increase deer abundance, concern about hazards associated with elk herds, and mixed attitudes towards beaver restoration at Boa Ogoi. I explain potential cross-boundary restoration barriers as well as opportunities based on

examples of local knowledge regarding these species. Finally, I characterize interviewee's relational values associated with these species.

Russian olive "Explosion" outcompetes Native Trees and Shrubs

One of the objectives for the Boa Ogoi stewardship restoration plan is the removal of invasive species at the site, the most prolific of which is Russian olive (*Elaeagnus angustifolia*). Introduced to the U.S. as an ornamental tree in the late 1800s, Russian olive was promoted by the Natural Resources Conservation Service (NRCS) in the western U.S. for plantings to prevent erosion and provide windbreaks until the 1970s. The tree is native to southern Europe, central Asia, and the western Himalaya region. Largely grouped in groves in riparian areas, Russian olive trees have thick spines and can grow nearly 45 feet tall (NRCS Technical Notes 2003).

At Boa Ogoi, Russian olive has outcompeted native species, including coyote willow (*Salix exigua*), which, according to Shoshone oral tradition, dominated in the area at the time of the Bear River Massacre (Parry 2019). Interview participants readily acknowledged the battle with Russian olive as a challenge for restoration in the area. Participant 6 said: "the Russian olives…[is] pretty well adapted to our climate, but not a great neighbor…I think that's going to be a challenge." The tree's thorns were mentioned as an issue, as it can tear clothes and impede the gathering of livestock. Interview participants expressed concern regarding Russian olive's ability for prolific growth and how it outcompetes native species:

> *"The Russian olive has just exploded over the years…they've been there a while, but in the last 20 years, they literally have…taken over is*

the word I would say in a lot of areas. And I mean, they're not supposed to be there." (Participant 7)

"So, I mean, they are very prolific, and they grow fast… that will be a struggle as they [NWBSN] move into trying to restore things to what they were at that time [of the massacre]. Often the native species are not as competitive." (Participant 3)

"When I grew up, we had Russian olives a lot in the area… and they were considered a real trash tree. Not only did they have sharp spikes and they was hard to get through, but they just spread and…took over areas…they hadn't been before. So, I am not a fan of Russian olives." (Participant 4)

Concern for the rapid growth and ability to outcompete species native to the area highlights multiple relational values when it comes to land stewardship. Responsibility mentioned above (Table 2.1) as "the way the land is managed reflects a larger responsibility for both plants and animals as well as future generations" could be interpreted as implicit relational values expressed by land managers.

Concern over the spread of Russian olive could be born out of a feeling of responsibility for the fate of native plant species on the landscape, as well as a responsibility to future generations to preserve those native species. Land stewardship for the benefit of other people–a responsibility for an individual's own impact on the land which could affect other people, particularly neighbors in the watershed–is another value that could be highlighted here. Participant 7: "My least favorite to try to get rid of but I

actively try to keep them off the farm as much as I can." Failure to control or eradicate invasive species on one's own land could result in its spread to neighboring properties, thereby negatively effecting other landowners in the community.

> *"I know the Russian Olive trees provide fantastic cover for wildlife, but they're also an invasive that…isn't supposed to be here originally. So, I think anytime we can promote any of those…riparian area plants- in particular cottonwoods- that grow farther upstream of that area would be beneficial down through the lower reaches." (Participant 10)*

In Chapter 2, I mentioned a desire for some participants to cultivate a relationship with the landscape that allows for further separation from the influence of other people, particularly government involvement in land stewardship (see section on prioritizing independence*).* This could partially explain negative feelings toward the initial introduction of Russian olive to the area:

> *"And so, irony… I guess you're aware that [Russian olive] was brought in by the NRCS [Natural Resource Conservation Service] right?....it is interesting, how the experts can often change…maybe the best example is the Russian olive situation…because it was an expert recommendation that brought it in originally." (Participant 3)*

Not all mention of Russian olive was negative, however. Multiple participants acknowledged its utility as a stabilizing force on the riverbank, its drought resistance, and the cover it provides for valued game animals such as pheasants. However, near consensus (10/12 participants) on the necessity of its management (and ultimately

removal) should be seen as an opportunity for collaborative stewardship in the watershed between the Tribe and its neighbors. This could prove to be a daunting task: because of its prolific growth and hardy nature, participants emphasized the challenge involved in removing Russian olive:

> *"They're easy when they're small, because you can get into them and grab them and cut them, but they're difficult to kill because if you cut them off at the root stump, they do resprout readily. And if you don't kill that stump or pull it out completely they just grow back…the bigger ones are tough if they're kind of a thicket because they grow thorns. And I mean…, if you got equipment, that's great. If you're doing it by hand and chainsaws, it's prickly." (Participant 7)*

> *"I think it'll be kind of a long uphill battle to get rid of a lot of the Russian olive and maybe some of the other invasive species and at the same time trying to restore the native the natural vegetation because it's just…you're destroying some of the invasive plants, you're also going to be destroying some of the native plants. And that may be hard to… do. Especially in a short period of time, I think it's going to be quite intensive over quite a long period of time to get it restored." (Participant 4)*

After the proposed removal of Russian olive, the NWBSN plan to replant native trees and shrubs. Interviewees valued several different species native to the area. Multiple participants stated cottonwood and willow trees as important replacements for Russian

olive because they offer cover to wildlife. Others value chokecherry and elderberry trees for the fruit they provide. Participant 7 said: “I get excited about things that taste good, that you can actually eat, like, you know, elderberries… I know it has really good medicinal properties.” A relationship to native species in the area could highlight the valuation of “wild nature”–striving to protect wild places and taking responsibility for the fate of nature–where participants acknowledge the cause and effect of Russian olive “takeover” in the area and may act to protect those native species.

Mule deer herds threatened by elk population growth

When asked if there were any species that were of particular value to them, interview participants frequently mentioned mule deer (*Odocoileus hemionus)* in a favorable light. Participant 4: “Yeah, I've always been a fan of mule deer… they would be my favorite species that would need to be protected, not only here on our property but on the … massacre site.” Restoration activities at the site, including re-introduction of beaver and removal of invasive species, aim to cultivate more diverse habitats (i.e., expanded stream habitat, higher quality riparian habitat) with a greater abundance and diversity of native species, which could expand the amount of forage available for mule deer. This would potentially be seen by surrounding landowners in a positive light. Participant 3, when asked what animal species he thought were valued the highest in the area: “of things that are valued, yeah, I would have to say that deer would be one of your, your highest ones.” Mule deer seemed to be the game animal of choice among interviewees, possibly due to their consistent presence in the area while populations of other game animals, such as elk, have fluctuated.

Elk are less valued by interviewees, however. Elk populations in Idaho experienced multiple downturns in the mid-to-late twentieth century, but due to changes in grazing practices that allowed for higher grass production, farmland cycling practices that create more rested farmland, and cyclical timber cuts that have created multiple habitat stages that are ideal for elk, the elk populations in southern Idaho began to expand in the late 1990's, a fact that has led to the necessity of the current 2014-2024 Elk Management Plan (Idaho Elk Management Plan, p. 7). Several interviewees mentioned the uptick in population of elk herds between approximately 1990-2021 in the area, leading to several concerns:

> *"There's an elk herd that's kind of grown and getting pretty dang big that uses the land a little more than they [elk herds in the past] did. They were more migratory 20 years ago. They're [now] more kind of a permanent fixture. And they winter in this country. They take advantage of the farm ground." (Participant 6)*

> *"As far as… elk populations go, our elk population's on a significant increase…particularly… just north of Preston… kind of the north end of the county where we've had a pretty strong increase in the population." (Participant 10)*

Elk are perceived to be a more troublesome species in the area for many reasons, the first being that they could contribute to a direct decline in the population of mule deer. Mule deer populations generally decline concurrent with the increase of elk populations (Idaho Elk Management Plan). Participant 4 said: "And now it…seems like

it's overrun with elk. And I think there's a decrease in the number of deer as a result." Some mentioned the danger of elk herds causing traffic hazards. Others worried about elk herds depleting their hay storage used to feed cattle in the winter, as well as the destruction of cattle fences that could cause havoc with livestock.

> *"Now elk are huge problem for us in the wintertime, because they all come out and come out on the highway and…can be a real detriment to stuff…eat your hay and come and tear stuff up…there's just so many of them that come…if they get down on the highway, it's quite a danger... [there] just weren't many when I was growing up, I don't ever remember elk." (Participant 3)*

Elk might not be a problem at the actual Boa Ogoi acreage. During a recent personal conversation with former NWBSN chairman D. Parry, he mentioned that there have been no recent sightings of elk at the site or nearby–but mule deer are present at the site and will potentially benefit from its restoration via increased vegetation for feed and cover. This can be seen as a potential opportunity for collaboration with neighbors and can be further explained by a difference in values informing relationships with elk and deer. A desire to preserve and maintain thriving deer herds could derive from not only a kinship with nature, but also relational values involving wild nature–striving to protect wild places; taking responsibility for the fate of nature–as well as reciprocity between stewards and their favorite game animal, which is being negatively impacted by the increase in elk herds in the region. The relationship between participants and elk seems to reflect different values than that of deer, largely highlighted by negative impacts on the health of participants or their families, such as destruction of hay crops vital for the

economic activities of participants, or the increased probability of potentially fatal traffic accidents involving elk herds.

Beaver activity disrupting agricultural practices

The NWBSN is considering using beaver as a restoration tool at the Boa Ogoi site to build dams that slow the movement of water across the site. Battle Creek (see Figure 7) was named based on the previous interpretation of the Boa Ogoi Massacre as a battle by white settlers in the area. The translation of what the NWBSN had called it is "Beaver Creek," implying an abundance of this species in this creek's watershed.

Beaver have been increasingly acknowledged as a restoration tool, particularly in the western U.S., where drought has led to lower water table levels and incised water channels, causing damage to riparian ecosystems. By live-trapping and re-introducing beaver, land managers can use these "ecosystem engineers" (Wright, Jones, and Flecker 2002) to accomplish restoration objectives, such as the regulation of stream flow and erosion reduction, leading to the restoration a more ecologically diverse aquatic and riparian habitat (Charnley et al. 2020). Preliminary use of the "Beaver Restoration Assessment Tool" (BRAT)(McFarlane et al. 2014) demonstrates that Boa Ogoi has the potential for sustaining a larger beaver population than currently exists based on perennial stream flow, existing dam building materials, and a stream gradient that would allow for dam building by beaver (Koutzoukis et al. *in prep).*

Some interviewees viewed a larger beaver population in the area in a more hesitant light. A main concern that was frequently voiced stems from the industrious nature of beaver in the construction of their compounds:

> *"We were fighting the beaver just this last summer in our irrigation way upstream on the Battle Creek. They got into a culvert…and dammed it off scrud* [thick or tight]*...three times…amazing the industry- we'd knocked it out with a backhoe and stuff, and then we finally got…where we could shoot one of them. But they're industrious little suckers. I'll tell you that." (Participant 3)*

> *"They do change the landscape drastically, you know, but I don't think in my opinion that beaver would do good… that rivers got to flow, you know, and in the bottoms they are not much above the river level. So you start damming it off to make habitat, you're gonna flood…you're gonna run water into your fields and whatnot." (Participant 8)*

Participants voiced concerns about beaver for several different reasons. They are concerned about beaver's propensity for building dams where they should not, particularly in irrigation ditches and culverts. Access to water is vital for farmers and ranchers who rely on access to sufficient water to make for their livelihoods. Participant 12 said: "And this is kind of…the top of Battle Creek but as farmers and neighbors and people needing the… water we usually dispatch with the beavers and their dams so that we get the flow down that we need in the summertime." Another commonly voiced fear was flooding, specifically in the springtime when higher water levels from the spring runoff are already a flood risk.

Beaver can be migratory to a point, sometimes moving up and downstream in search of more suitable habitat, providing a chance that animals that have been live-trapped and relocated to the site may not actually stay there (Castro et al. n.d.). This could

prove to be a potential barrier for establishing or maintaining working relationships built on collaborative restoration between the Tribe and their neighbors if re-established beaver move to properties where they are not wanted. Participants were also bothered by the tendency for beaver to cut down trees that are prized by landowners for windbreaks or for aesthetic reasons. Participant 10 said: "some landowners really enjoy having them around, and some of them…[when] they cut down their prized trees…they have concerns with those." This was viewed as a concern by multiple participants. Participant 6 said: "you can introduce them [but that] doesn't mean they're gonna stay." This seems to highlight the value of "other people" in the area, where participants show concern that impacts on the land via beaver reintroduction could negatively impact others in the area.

In spite of the potential for conflict surrounding beaver, some landowners tolerate their presence. The following quote shows a relationship with beaver built on values of reciprocity, where the land steward allows beaver presence on their land with an expected return benefit of better feed for livestock and a more aesthetic landscape:

> *"Where we summer our cows…we actually try to help the beaver population because they dam the water off and they spread the water out and make… beautiful meadows and they keep the quakes [quaking aspen, Populus tremuloides] back out of the meadow so that the cattle have a place to graze." (Participant 12)*

Local knowledge connects to relational values via salient species

This research has explored specific relational values attributed to four species–elk, Mule deer, Russian olive, and beaver–that are present in the Battle Creek watershed and could potentially be seen as barriers or opportunities for overall collaborative restoration between the NWBSN and their neighbors. Numerous species beyond the four that were most prominent in my analysis are important to this region's ecosystems, leaving room for more research on other species that may be key to overall success of restoration efforts in the area. That being said, this paper uses a case study to explore a novel approach to "mobilization", the first step in a five-step framework for weaving knowledge systems (Tengö et al. 2017) using relational values. This study provides a novel approach to connecting local knowledge about regionally salient species with particular relational values by clarifying the linkage between knowledge of a species to the values underlying the relationship an individual may have with it (Figure 3.2). For example, local knowledge about Russian Olive such as its effects on agricultural production in the region is associated with relational values of a responsibility to the landscape and the surrounding community to control its spread. Further, clarifying these linkages can help frame restoration messages that resonate with particular audiences and this knowledge mobilization approach with attention to relational values could be adapted to and tested in other regions, where plant and animal species, as well as the relationships that people have with them, differ.

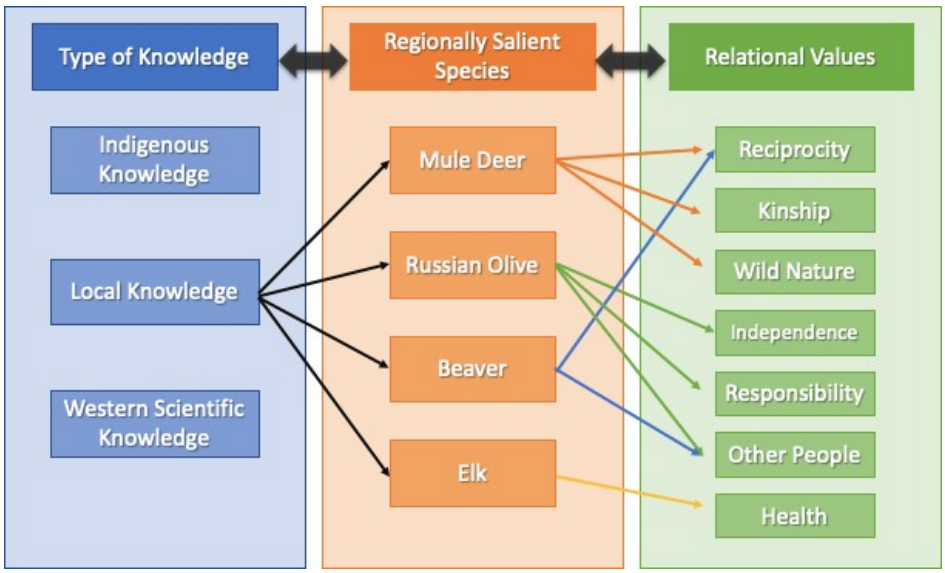

Figure 3.2 Boa Ogoi site-specific species and relational values that study participants attributed to them.

Recommendations for Future Research

In my previous chapter (see *Understanding Cultural Identities and Relational Values to Inform Watershed Restoration Message-Framing at The Boa Ogoi Historical Site),* I focused on relational values in addition to group values and worldviews (Kahan 2010). *At the Boa Ogoi Historical site,* the findings on species-specific relational values contained in this paper could be used to inform effective messaging between the NWBSN and their neighbors. Future research could test the effectiveness of the scientific message-framing to which my research points. In the previous chapter I suggested a possible future research study to test the effectiveness of message-framing that emphasizes relational values. Something similar can be done with the results of this study, where a sample of participants that are representative of demographics of the Battle Creek region could be separated into three groups and given one of three messages on restoration at the Boa Ogoi site. One of these messages should contain information that is reinforced by

species specific relational value data from this research. A survey could then be administered which measures the participants response to this message compared to the response from participants who were given messages that didn't contain this data.

Conclusion

Local and Indigenous Knowledge systems can complement Western Scientific Knowledge in efforts to combat the decline of biodiversity caused by human activity, establishing a need to recognize diverse knowledge to support land stewardship. In this chapter, I take a novel approach to knowledge mobilization, a preliminary task in weaving diverse knowledge systems, by characterizing relational values. My case study at the Boa Ogoi Historical Site in southern Idaho, provides insight from semi-structured interviews with surrounding land managers and owners on species-specific opportunities for stewardship. Because many participants came from families who were multi-generational residents of the area, I suggest that they could possibly hold potentially useful knowledge regarding land and species management in the area. In this research, I analyze examples of four species-specific areas of the restoration process which could be potential barriers or opportunities to collaborative restoration for the Northwestern Band of Shoshone Nation and their neighbors, including: Russian olive removal, restoration of Mule deer habitat, and the reintroduction of beaver to the Battle Creek. Framing restoration goals as a benefit to desired species as well as a collaborative effort to combat undesired invasive species could generate collective action toward achieving restoration goals in the Battle Creek region. Through the analysis of relational values, I argue that the values underlying the overall relationship between the individual and certain species

are informed by the knowledge system of the individual. Further, I contend that understanding these relational values – which encompass more than instrumental values driving land use – will likely be key to long-term successful collaborative stewardship in the area.

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CHAPTER IV: CONCLUSIONS

Synthesis of Results

Theoretical Background

There exists for some an increased urgency to identify and implement solutions for a growing list of human-induced environmental issues, such as biodiversity loss and degraded water quality, creating a need for collaborative action at the local, national, and global levels to combat environmental degradation. A major hurdle to the creation of effective and long-lasting environmental policy, particularly in the U.S., is the growing chasm between partisan groups concerning how to address politicized environmental issues. This has led social scientists to theorize about more effective ways to disseminate scientific information that avoids further political polarization on the subject (Kahan 2010b). One theory, cultural cognition, attempts to explain the dissonance between individual behavior and behaviors recommended by scientists to circumvent environmental risks, particularly by examining a lapse in rationality of the individual due to the influence of groups and worldviews that they subscribe to (Kahan et al. 2012).

Relational values, or "values linking people and ecosystems via tangible and intangible relationships to nature as well as the principles, virtues, and notions of a good life that may accompany these" (Klain et al., 2017, p. 1), can also be useful when evaluating value systems of the individual, particularly when some values–in the case of this research, values of land stewardship– held by an individual have the potential to be contradictory to the larger groups they identify with. I argue that a thorough

understanding of the relationship individuals have with their environment can contribute in a meaningful way to the creation of scientific messaging that minimizes the risk of political polarization or alienation by acceptance of the individual from the groups they subscribe to (Kahan et al. 2011; Newman et al. 2018). Establishing a relationship built upon trust– and lacking the fiery discourse of partisan politics–between scientists and the general public has proven to be difficult in today's politically charged climate, where popular media is more accessible than ever before, often reporting information in a way that supports and confirms the worldviews of their chosen audience (i.e., conservative media downplaying the urgency of climate change, ultimately contributing to the distrust of scientists (Newman et al. 2018)).

Of further importance is the need for creative solutions for prevalent environmental problems, such as water shortages, increasingly intense wildfires, and severe air and water pollution. More collaborations among scientists and other knowledge holders, particularly those with Indigenous and local knowledge, have the potential to enhance knowledge and governance of social-ecological systems (Tengö et al, 2017). In short, weaving western scientific knowledge with knowledge contributed from alternate knowledge could potentially enrich and improve environmental policy and management.

Research Area and Methods

Using a qualitative case study approach, this thesis first explored relational values of stewardship held by individual landowners and land managers in the Battle Creek watershed area. This part of southern Idaho is near the location of the Boa Ogoi Historical site, where the Northwestern Band of Shoshone Nation (NWBSN) have begun

construction of a cultural interpretive site and are planning to restore the surrounding landscape to a semblance of pre-colonial conditions. In an initial profile of the region, I found that residents of the area are predominately white and conservative, and overwhelmingly subscribe to the Mormon faith (*see Chapter II: Understanding Cultural Identities and Relational Values to Inform Watershed Restoration Message-Framing at The Boa Ogoi Historical Site*). I then utilized data from 15 semi-structured interviews with 12 individual landowners residing in southern Idaho and northern Utah (10 of the individuals identified as men, 2 identified as women, and 10 identified as white, 2 as Native American), to code for a typology of relational values of stewardship influenced by the work of Klain et al. (2017). Participants included farmers, ranchers, and environmental professionals in the area. My analysis organized data into three themes: stewardship and the individual; stewardship and the community; and stewardship and nature.

Relational Values Can Inform Message-Framing

I found that some of the interviewees identified with the landscape in deep and intimate ways, with relationships to the land that transcended traditional instrumental (economic and extraction-based) and intrinsic (the belief that nature has its own inherent value) value systems (Allen et al. 2018). For example, residents expressed a strong responsibility for the well-being and maintenance of the landscape. Though they valued independence from outside involvement in the stewardship of their land–particularly from the federal government–interviewees valued stewardship for the sake of other people, particularly for their neighbors and surrounding community, as well as for the

sake of future generations. Further, around half of the participants spoke of the importance of stewardship as it pertains to the health of the natural landscape, speaking of the importance of removal of invasive species and the restoration of endemic species, an important objective in the Boa Ogoi stewardship plan (Parry, 2019). This suggests potential opportunities for collaborative restoration between the NWBSN and their neighbors. Additionally, my research offers insight on important relational values that could inform more targeted and effective messaging between the Tribe and the surrounding community. I offer that message-framing surrounding potential restoration objectives should consider relational values of stewardship to communicate their benefit in a way that is important to the audience. These communications should focus on the individual's relationship with the management of the landscape and could be supported by respected local officials and leaders.

I also found potential barriers to collaborative restoration and working relationships between the NWBSN and their neighbors. Consistent with conservative worldviews, interviewees frequently mentioned the desire to make their own land stewardship decisions, with fear of government overreach and the encroachment of development (Newman et al. 2018). These concerns could potentially be troublesome for the NWBSN, as construction of an interpretive center and potential increased visitation to the site seemed to fall into the category of development encroachment. Further, residents seemed to fear a change in the status quo and did not want people seen as "outsiders" involved in local affairs, a category seemingly encompassing members of the NWBSN. Concluding this first study, I offered potential message-framing recommendations based on the recommendations of Kahan (2010), suggesting that communication of restoration

objectives should highlight key relational values that I identified in my interviews, such as the removal of invasive species as a benefit to the community, or the preservation of native species for the enjoyment and benefit of future generations.

Relational Values assist in the Knowledge Weaving process

My second study approached a knowledge weaving framework gleaned from the work of Tengö et al. (2017). I argued that the first step, the creation of mobilization processes to begin the synthesis of knowledge, such as organizing community-led data collection exercises, could benefit by first characterizing the relational values of individual knowledge holders. Many of the interviewees were members of families who have farmed and ranched the land in the Battle Creek region for multiple generations, suggesting that they may hold knowledge that can pertain to land management practices, invasive species management, and agricultural methods (Joshi et al. 2004) which could potentially be used to address environmental issues associated with agricultural pollution, road construction, grazing, water diversion, and destruction of riparian areas by livestock (Kauffman, 1997).

For this study I identified four species that could potentially serve as barriers or opportunities for collaborative restoration between the NWBSN and their neighbors: elk (*Cervus Canadensis*), Mule deer (*Odocoileus hemionus*), Russian olive (*Elaeagnus angustifolia*), and beaver (*Castor*). I focused on the values that informed the relationships interviewees had with these species. I found that local landowners possess valuable knowledge pertaining to the management of these species. Interviewing land managers

about their local knowledge naturally led to discussions about why these species are valued or not by residents of the area.

Using an augmented version of Klain et al.'s (2017) typology of values, I coded my interviews while focusing on these four species. I found consensus among interviewees in concern for the spread of Russian Olive, with implicit relational values of stewardship underlying their relationship with the species. These included a responsibility to the landscape, as well as neighbors and the community, to control its spread. As the removal of Russian Olive at the Boa Ogoi site is an important objective in the site stewardship plan, my results point towards this removal as an opportunity for collaborative efforts between the Tribe and neighboring landowners.

Another potential opportunity could come with the creation of Mule deer habitat, a highly valued game species in the area, through removal of noxious weeds and the restoration of native vegetation at the site. Deer herds in the area have declined in recent years, partially due to the uptick in elk populations in the region, a species which can directly compete for habitat with deer (Anon n.d.). Interviewees expressed concern over the growth of elk herds, citing– in addition to the decline in Mule deer–an increase in dangerous traffic accidents and the destruction of hay crops by elk. In personal communications with one Tribe official–Darren Parry (2021)– I was told that elk rarely are seen at or around the site, but Mule deer are quite common. I argued that an improvement of Mule deer habitat could be communicated to neighboring landowners as a benefit of the site restoration project, potentially creating an opportunity for cross-boundary collaboration between the NWBSN and landowners who value the species.

I found the fourth species, beaver, to have the most potential for contention between the Tribe and its neighbors, as the stewardship plan will expand suitable habitat for the existing beaver population and could potentially call for the relocation of beaver as a restoration tool to the Battle Creek. Beaver have been increasingly acknowledged as a restoration tool, particularly in the western U.S., where drought has led to lower water table levels and incised water channels, causing damage to riparian ecosystems (Charnley et al. 2020). By live-trapping and re-introducing beaver, the Tribe could potentially benefit from beaver activity to accomplish restoration objectives, such as the regulation of stream flow and erosion reduction, leading to the restoration a more ecologically diverse aquatic and riparian habitat (Charnley et al. 2020). Though a few interviewees mentioned a potential relationship of reciprocity with beaver, allowing them to reside in streams on their land while benefitting from their activity, most interviewees expressed concern for the negative effects of beaver activity, including flooding, the disruption of stream flow for agricultural use, and destruction of prized trees on their land. These concerns seemed to highlight values of responsibility, as well as concern for other people and community. If attitudes towards beavers remain in their current state among regional land owners, beaver could serve as a potential barrier to collaboration between the tribe and their neighbors, as beaver activity has the potential to cause a rift between the two groups. This potential source of conflict should be taken into account when creating the site stewardship plan.

Recommendations for Future Research

This research builds upon previous research on relational values of stewardship by applying the concept to message-framing literature built on the theory of cultural cognition, as well as research involving weaving alternate knowledge systems with western scientific knowledge. However, I acknowledge the limited scope of this case study, necessitating replication at a larger scale to confirm the utility of relational values in other contexts. More research is needed on the possible linkages between relational values and the groups and worldviews subscribed to at an individual level. Individuals hold the ability to rationally understand and act on communicated scientific information, yet often choose to ignore or even outright deny that information to avoid alienation by groups they subscribe to (Kahan et al. 2012, 2015; Newman et al. 2018). This research suggests that communications that highlight relational values could potentially be more effective, leading to the question: is there a dissonance between relational values of stewardship held by individuals and the values underlying the groups and worldviews they subscribe to? An example of this would be concern for future generations leading a land manager to participate in positive environmental behaviors –such as reduction of emissions or a change in agricultural watering practices–which may be at direct odds with a conservative worldview. If this dissonance exists, how could this potentially affect other future stewardship decisions? At Boa Ogoi, more research is needed involving potential differences and similarities in relational values between the NWBSN and their neighbors. I anticipate differences in the valuation of the landscape between the groups, possibly due to a difference in worldview that the NWBSN, as well as most other Indigenous groups in America, see humans as a part of rather than separate from nature (Salmon 2000). While I did find some evidence to suggest interviewees identified with

the landscape, kinship with nature was much less present. I suggest that this information could inform efforts to communicate and create stronger collaborative relationships between these groups. The effectiveness of this research should also be tested empirically, where a sample of participants from the Battle Creek area could randomly be asked to read one of three messages involving restoration at the site. One of these messages should contain relational value data from this research highlighting the importance of the values from my analysis. A survey could then be presented to all participants to quantitively assess their reaction to the message.

Interview participation in this study was largely skewed toward male interviewees. In Chapter II (*Understanding Cultural Identities and Relational Values to Inform Watershed Restoration Message-Framing at The Boa Ogoi Historical Site)* I argued that the "White Male" effect could be a factor in stewardship decisions in the Battle Creek watershed due to the fact that an overwhelming majority of residents in the area (91%) are white (Idaho-demographics.com, accessed 2021). Research has also previously shown that women exhibit more concern toward environmental risk than men (Shi, 2015). Only 2 out of 12 of interview participants in this research identified as women. I believe more research exploring potential differences or similarities in relational values of environmental stewardship between genders is needed to paint a more complete picture of the subject.

I recommend that more research should be done involving the use of relational values to assist in the knowledge weaving process. This research focused on the initial step–the first of five, mobilization–in the synthesis of knowledge systems (Tengö et al. 2017), and only involved relational values informing the relationships of four plant and

animal species in the Battle Creek area. Further research is needed on whether the characterization of relational values and sharing this information can assist in fostering understanding and trust among diverse stakeholders, and a collaborative atmosphere for the co-production of knowledge between scientists and knowledge holders.

Conclusion

My research represents a step forward in understanding relationships between the individual and their environment. At Boa Ogoi it was clear to me that interview participants had not only important and relevant knowledge, but a connection with the stewardship of the landscape that was deeper and more meaningful than just its instrumental function. Understanding this helps establish a foundation for a working partnership in the Battle Creek area between the NWBSN and other landowners that is built on trust and common ground. Informed communication should consider not only what is being said, but how it is being said (Kusmanoff et al. 2020). This research will ideally inform not only future studies at the Boa Ogoi site, but also interactions between land managers and stakeholders elsewhere.

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Appendices

Appendix A. IRB Approval Letter for Supporting the Boa Ogoi Stewardship Plan with Local Ecological Knowledge Research Protocol

Certificate of Exemption

From: Melanie Domenech Rodriguez, IRB Chair
Nicole Vouvalis, IRB Director
To: *Sarah Klain*
Date: *July 31, 2020*
Protocol #: *11284*
Title: *Supporting the Boa Ogoi Stewardship Plan with Local Ecological Knowledge*

The Institutional Review Board has determined that the above-referenced study is exempt from review under federal guidelines 45 CFR Part 46.104(d) category #2:

> *Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subject; (ii) Any disclosure of the responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation, or (iii) the information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and the IRB conducts a limited IRB review to make required determinations.*

This study is subject to ongoing COVID-19 related restrictions. As of March 15, 2020, the IRB has temporarily paused all in person research activities, including but not limited to recruitment, informed consent, data collection and data analysis that involves personal interaction (such as member checking and meaning-making). If research cannot be paused, please file an amendment to your protocol modifying procedures that are conducted in person. The IRB will notify you when in person research activities are once again permitted.

This exemption is valid for five years from the date of this correspondence, after which the study will be closed. If the research will extend beyond five years, it is your responsibility as the Principal Investigator to notify the IRB **before** the study's expiration date and submit a new application to continue the research. Research activities that continue beyond the expiration date without new certification of exempt status will be in violation of those federal guidelines which permit the exempt status.

If this project involves Non-USU personnel, they may not begin work on it (regardless of the approval status at USU) until a Reliance Agreement, External Research Agreement, or separate protocol review has been completed with the appropriate external entity. Many schools will not engage in a Reliance Agreement for Exempt protocols, so the research team must determine what the appropriate approval mechanism is for their Non-USU colleagues. As part of the IRB's quality assurance procedures, this research may be randomly selected for audit during the five-year period of exemption. If so, you will receive a request for completion of an Audit Report form during the month of the anniversary date of this certification.

In all cases, it is your responsibility to notify the IRB **prior** to making any changes to the study by submitting an Amendment request. This will document whether or not the study still meets the requirements for exempt status under federal regulations.

Upon receipt of this memo, you may begin your research. If you have questions, please call the IRB office at (435) 797-1821 or email to irb@usu.edu.

The IRB wishes you success with your research.

Appendix B. Interview Recruitment Letter

Local Knowledge to Inform Land Management on the Boa Ogoi Cultural Site

You are invited to participate in a research study led by Dr. Sarah Klain, an Assistant Professor in Environment and Society at Utah State University. This research will contribute towards Cole Stocker's MSc thesis and Will Munger's PhD dissertation. The purpose of this research is to gather information that will be useful for the development of the Bear River Massacre Site stewardship plan. Specifically, we are interested in learning about your local ecological knowledge relevant to the reintroduction of native species, such as trout. We are also interested in understanding your perspective on the development of this cultural site. You are being asked to participate in this research because you or your family works on or owns land in the Battle Creek watershed area.

Your participation in this study is voluntary and you may withdraw your participation at any time for any reason.

If you take part in this study, you will be asked to complete a five-minute demographic survey then participate in a recorded interview lasting between 30-60 minutes.

The possible risks of participating in this study include psychological stress related to discussing potentially contentious topics, including reintroduction of different species and land management changes. To minimize and avoid psychological stress, the confidentiality of the information that you share is guaranteed and you are free to stop participating in the interview at any point.

The benefits of participating in this study is that your local knowledge may contribute to the stewardship plan under development for the Bear River Massacre site. We cannot guarantee that you will directly benefit from this study, but it has been designed to learn more about your knowledge of the land and waters in the Battle Creek watershed. If you participate, you will be entered into a raffle to win a $50 gift certificate to IFA.

We will make every effort to ensure that the information you provide remains confidential. We will not reveal your identity in any publications, presentations, or reports resulting from this research study. However, due to the nature of our study focusing on interviewing people who live in a rural area, it may be possible for someone to recognize specific opinions or perspectives that you share with us.

We will collect your information through audio recorded phone interviews or recorded computer-based video interviews. Online activities always carry a risk of a data breach, but we will use systems and processes that minimize breach opportunities. All recordings of interviews and transcripts will be securely stored in a USU password-protected cloud storage account and deleted after five years or less. Your name will be removed from your survey response and interview transcript before we analyze our results.

You can decline to participate in any part of this study for any reason and can end your participation at any time.

If you have any questions about this study, you can contact Dr. Sarah Klain at sarah.klain@usu.edu. Thank you again for your time and consideration. If you have any

concerns about this study, please contact Utah State University's Human Research Protection Office at (435) 797-0567 or irb@usu.edu.

By selecting "Agree" then typing your name and the date below, you agree to participate in this study. You indicate that you understand the risks and benefits of participation, and that you know what you will be asked to do. You also agree that you have asked any questions you might have, and are clear on how to stop your participation in the study if you choose to do so. Please be sure to retain a copy of this form for your records.

Appendix C. Supporting the Boa Ogoi Stewardship Plan with Local Ecological Knowledge Interview Protocol

Boa Ogoi Site Restoration Interview (First Time Interview)
Interviewee Name:
M / F
Landowner/Other

1. Interview Introduction

Length of interview: 30-60 minutes
Goal: to gather Local Ecological Knowledge and understand nearby landowner perceptions regarding the restoration and management of the Bear River Massacre Site. The Northwest Band of Shoshone purchased this historical site in 2008, as well as adjacent land in 2018. As you may know, the band is going to build a cultural interpretive center there. Also, they are removing trees like Russian Olive and planting other types of vegetation in order to restore the site to the condition it was in in 1862.

2. Verbal Consent and Assurance of Anonymity

Assure participant that no information regarding their identity will be shared, and go over the confidentiality agreement
Would you be willing to participate in this interview?
The participant has given verbal consent
The participant has not given verbal consent

3. Participant Background

Get basic information about the participant through basic questions:

- How long have you/your family been living in the area?
- What do you do for a living? Tell me about it (if it's relevant to land use in the area)
- What do you use your land for?

4. Stewardship

Questions regarding relational values of land management and the roles, responsibilities, and rights imbedded in "good stewardship"

- How would you describe your relationship with the land? With the Battle Creek Area?
- How has your upbringing effected how you relate with your land? With the Battle Creek area?
- What does the word 'stewardship' mean to you?
- What does self-sufficiency mean to you?
- What does 'living well' mean to you? How does this effect how you manage your land?
- What motivates you the most when it comes to the management of your land?

- Are there land management problems you are concerned about that future generations will face in the area? If so, can you tell me about them?
- How do you think that your management actions effect future generations?
- Do your neighbor's management actions effect you personally? How so?

5. Boa Ogoi Site Restoration

Questions regarding Boa Ogoi site restoration objectives and the animal and plant species involved

- How could changes to land management on this historical site affect your land?
- Do you foresee issues arising from the band's changes in land management for other neighboring landowners?
- Do you think the community should be involved in developing a management plan for the site? If yes, how so?
- Do you have any concerns regarding changes to land management at the Bear River Massacre Site? Are you interested in being more involved? If so, how? If not, why not?

Part of the restoration plan will involve reintroduction of native plants to the riparian area of the site.

- Are there native plants you would like to see reintroduced in the area?
- Are there any native plants in this particular area that you value? Can you tell me about that?
- Have the plants in the area changed over time? If so, how?
- How has your relationship with the plants on your land changed over time?
- What is your experience with Russian Olive?
- What is your experience with noxious weeds, such as Dyer's Woad?

Part of the restoration plan will involve reintroduction of native animal species to the site.

- Are there any native animal species you would like to see reintroduced to the area?
- Are there any animals in this particular area that you value?
- Have the animal species in the area changed over time? If so, how?

Battle Creek was originally referred to by the Shoshone tribe as "Beaver Creek". In the effort to restore this area to 1862 conditions, there are some who would like to see beaver relocated to the area.

- What is your experience with beaver?
- Do you see any issues with reintroduction of beaver to the area?
- What are your thoughts on potentially grazing buffalo on the land surrounding the site?

- What are your thoughts on potentially grazing wild horses on the land surrounding the site?

7. Conclusion of Interview

Thank the person for their participation in the interview, ask them if they have any questions.

- Are there other people who I should interview on these topics who live near Battle Creek? Can you share their contact information?
- Are there other people in this area I could interview who you think would answer quite differently than you did? Can you share their contact information?

Local Knowledge and Relational Values Boa Ogoi Interview Protocol (Follow Up Interview)

Interviewee Name:

1. Interview Introduction

Thank them for participating then mention:

- *Length of interview is 30-60 minutes*
- *Goal: to gather Local Knowledge and relational values regarding the restoration and management of the Boa Ogoi site.*

2. Verbal Consent and Assurance of Anonymity

Remind participant that no information regarding their identity will be shared. Reiterate that they already gave consent via the online survey they took.

3. Stewardship

Questions regarding relational values of land management and the roles, responsibilities, and rights imbedded in "good stewardship"

Once again, the purpose of this interview is to better understand how people use and think about land in the Battle Creek Area.

- How long have you/your family been living in the area?
- What do you do for a living? Tell me about it (if it's relevant to land use in the area)
- How would you describe your relationship with the land? With the Battle Creek Area?
- How has your upbringing effected how you relate with your land? With the Battle Creek area?
- What does the word 'stewardship' mean to you?
- What does self-sufficiency mean to you?
- What does 'living well' mean to you? How does this effect how you manage your land?
- What motivates you the most when it comes to the management of your land?

- Are there land management problems you are concerned about that future generations will face in the area? If so, can you tell me about them?
- How do you think that your management actions effect future generations?
- Do your neighbor's management actions effect you personally? How so?

4. Boa Ogoi Site Restoration

Questions regarding Boa Ogoi site restoration objectives and the animal and plant species involved

The Northwest Band of Shoshone purchased this historical site in 2008, as well as adjacent land in 2018. As you may know, the band is going to build a cultural interpretive center there. Also, they are removing trees like Russian Olive and planting other types of vegetation in order to restore the site to the condition it was in in 1862.

- How could changes to land management on this historical site affect your land?
- Do you foresee issues arising from the band's changes in land management for other neighboring landowners?
- Do you think the community should be involved in developing a management plan for the site? If yes, how so?
- Do you have any concerns regarding changes to land management at the Bear River Massacre Site? Are you interested in being more involved? If so, how? If not, why not?

Part of the restoration plan will involve reintroduction of native plants to the riparian area of the site.

- Are there native plants you would like to see reintroduced in the area?
- Are there any native plants in this particular area that you value? Can you tell me about that?
- Have the plants in the area changed over time? If so, how?
- How has your relationship with the plants on your land changed over time?
- What is your experience with Russian Olive?
- What is your experience with noxious weeds, such as Dyer's Woad?

Part of the restoration plan will involve reintroduction of native animal species to the site.

- Are there any native animal species you would like to see reintroduced to the area?
- Are there any animals in this particular area that you value?
- Have the animal species in the area changed over time? If so, how?
- What is your experience with beaver?
- Do you see any issues with reintroduction of beaver to the area?
- What are your thoughts on potentially grazing buffalo on the land surrounding the site?

- What are your thoughts on potentially grazing wild horses on the land surrounding the site?

7. Conclusion of Interview

Thank the person for their participation in the interview, ask them if they have any questions.

- Are there other people who I should interview on these topics who live near Battle Creek? Can you share their contact information?
- Are there other people in this area I could interview who you think would answer quite differently than you did? Can you share their contact information?