COMING TO KNOW:

AN INDIGENIST INFORMED ETHNOGRAPHY ON NIMÍIPUU KNOWLEDGE AND ITS INTEGRATION INTO ENVIRONMENTAL MANAGEMENT

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Authorization to Submit Dissertation

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Abstract

Increasing pressure and demands on wildlife, plants, ecological systems, and their landscapes underline the growing importance for understanding human-environment interactions. To address land use issues and ecosystem health, environmental managers are integrating traditional ecological knowledge (TEK) and indigenous knowledge (IK), knowledge-practice-belief systems, through collaborative efforts. Despite, positive motivations for such strategies, concerns remain regarding whether non-indigenous land and resource managers have the ability to value TEK or IK and whether such community specific and place based knowledge can be integrated into existing management structures without threats to its integrity. Such concerns and challenges are paralleled within academic institutions as indigenous academicians and those working with indigenous communities struggle within the existing institutional structures to support indigenous knowledge and communities.

This doctorate research addresses the integration of community specific and place-based knowledge into both research and environmental management. It explores the challenges academic and management philosophies pose when rooted in notions of a secularism and objectivity to indigenous knowledge and their communities. This dissertation illustrates indigenous knowledge is rooted in a praxis philosophy of *coming to know* reality through one's subjective relationship with the landscape and their community by using indigenist theory and Nimíipuu concepts, propositions, and principles. The supporting research was generated collaboratively with Nez Perce tribal participants utilizing an indigenist informed ethnographic approach to explore Nimíipuu knowledge, practice, and perspectives of the landscape and toward environmental management. This dissertation argues both academic research and environmental management involving indigenous communities must integrate ontological, epistemological, and axiological principles of the communities to support tribal sovereign and self-determination.

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1) Introduction

Increasing pressures on the landscape continue to underline the importance of human-environment interactions and the relevance of social dimensions of environmental management (Ingold, 2000; Kosek, 2006; Knight, 2000; Lindquist, 2000). The land-use practices and associated knowledge of surrounding communities often conflict with land management agencies' management practices. Shortcomings in management exist that stem from over emphasizing historical baselines gathered during periods of high disturbance, a lack of diachronic observations of the landscape, and understanding ecosystem level changes over time (Butler, 2006). To address these issues, federal land managers are directed to engage in consultations with surrounding indigenous communities. Both, mandates for tribal consultations and a need for diachronic knowledge have led to interests in indigenous knowledge integration into environmental management.

Indigenous knowledge (IK) as a concept used in environmental management is contained within the broader notion of traditional ecological knowledge (TEK). Both are gaining increased attention for their potential integration into federal and state-led natural resource management. Indigenous knowledge is a specification of the form of traditional understanding that would be included within the field of traditional ecological knowledge, among other forms of non-indigenous traditions, for example among centuries old practices of dry land farming in southern Spain (Cortes-Vazquez & Zedalis 2013). Co-management theorists define IK, as indigenous communities' "knowledge–practice–belief systems" that consist of worldviews shaped by environmental components. IK is diachronic, generationally transmitted, and is "fundamentally linked to ecology" (Tang & Gavin, 2010). At what level of management IK can be integrated is unsettled. Historical relations and paradigmatic differences between indigenous communities and non-tribal government agencies, cause misunderstandings and political dynamics exacerbate conflicts. Furthermore, the existent structures predominant in environmental management often pose barriers to IK integration as they decontextualize knowledge that is community specific and place based (Joubert & Davidson, 2010; Nadasdy, 2003a, 2003b; Sherman, 2010; West et al., 2006).

A growing framework for research methodology, indigenist theory provides insights on such environmental management challenges. Indigenist theory is primarily a theory with interweaving ethical and epistemological components; it makes claims about the nature of IK and it makes claims about how such research ought to be conducted, presented, and utilized. The central claim of indigenist theory is that there are structures existing in academic institutions that continue to undervalue, delegitimize, and de-contextualize IK and such research has negative impacts on indigenous communities (Atleo, 2004; Deloria, 1997; Deloria & Wildcat, 2001; Graveline, 1998; Kovach, 2009; Tuhiwai-Smith, 2012; Wilson, 2008). As such, indigenist theory views IK as involving ontological, axiological, and epistemological principles that diverge from the assumptions that indigenist theorists see as common within academic research paradigms. To remediate these shortcomings, indigenist theorists advocate pursuing research that self-reflectively incorporates IK into the research and research process itself, rather than objectifying IK as merely an object for detached research. By enacting IK processes in co-generation with other research processes, IK can have an organic, well-rooted home in academic and other research institutions.

Although indigenist theorists critique academic institutions and resultant research processes for de-legitimizing IK and disenfranchising indigenous communities, such arguments are also applicable to environmental management and its managers. Similar structures that exist in academic institutions also prevail in environmental management agencies. Indigenist theory, when applied as a general tool for understanding paradigmatic principles often held by indigenous communities, articulates how such principles are divergent from common paradigmatic assumptions. The framework helps pave the way for conceptualizing community and place specific expressions of such principles. Such contributions have relevancy within debates surrounding IK integration into environmental management, as differences in conceptual assumptions held by both researchers and resource managers engaging with indigenous communities effect research and environmental management processes in similar ways.

Paired with adaptive collaborative management (ACM), indigenist theory provides insights on strategies for IK integration into environmental management. Such a combination enables both researchers and land managers to be aware of their paradigmatic assumptions, the existing challenges associated with integrating community specific and

place-based knowledge into externally formulated structures, and the importance of multi-level collaboration. The objective of this chapter is to assist both researchers and environmental managers in implementing practices that support indigenous knowledge and communities and helps to preserve and sustain socio-cultural landscapes through a process of knowledge co-generation.

The following chapter describes major concepts and propositions within ACM and indigenist theory. Described are interpretations of IK, as the construct is defined and conceptualized by ACM and indigenist theorists. Illustrated in the following discussion, are the contributions indigenist theory propositions and community-specific experiences make toward a more expansive notion of IK. Such a discussion precedes the chapter's objective to explore the contributions an indigenist theory framework combined with applications of ACM can make to environmental management strategies that involve indigenous communities. As such, this chapter addresses pragmatic issues by reviewing several examples of IK integration into environmental management. The latter section of this chapter will address the questions: What paradigmatic and structural differences affect IK integration?, What political and historical factors affect IK and collaboration with indigenous communities?, What are some of the land management contexts that IK can contribute to?, What strategies need to be adopted for a process of knowledge co-generation in environmental management? Recommendations will follow each question.

2) Adaptive Collaborative Management

Adaptive collaborative management (ACM) is a method for environmental management that integrates adaptability through adjusting and evolving in response to the landscape. It promotes intra-group as well as external collaboration (Berkes, 2012). This management approach governs multi-actor management practices (Armitage et al., 2009; Klooster, 2002; Plummer, 2009). As such, it encourages learning and flexible processes of collaboration through social network building to resolve environmental management challenges (Armitage et al., 2009; Kristofferson & Berkes, 2005; Parlee & Berkes, 2006). The approach argues for incorporating local systems and institutions into external agencies' management strategies through TEK or IK integration (Klooster, 2002; Kristofferson & Berkes, 2005; Parlee & Berkes, 2006).

In ACM contexts, the environment is portrayed as a natural landscape that cannot be controlled by humans and is unpredictable, therefore requiring management institutions to be responsive to feedbacks (Berkes, 2012). Institutions can either consist of *formal* or *informal practices* that structure social interactions. *Formal practices* are measured by variables such as rules, laws, constitutions, and organizational entities. An example of an institution with *formal practices* would be the Forest Service entity and system of management, in which formal practices are predicated by set department structures and rules regarding management duties. *Informal practices* on the other hand refer to codes for conduct, behavioral norms, conventions, and social sanction variables (Armitage et al., 2009). Social capital, people's social connections and shared values that promote social cooperation, is an example of an *informal practice* present in multiple types of institutions that affects the quality and quantity of interactions.

Institutions govern behaviors falling under *formal or informal practices* and this governance i.e. the cumulative set of human interactions that organizes regulations entails varying degrees of power and control among human relationships. The relationships between people and institutions rely on networks i.e. the bonds formed by both social and ecological systems, just as animals or plants rely on ecosystems. Variables that can measure *social networks* include information flow, shared understandings, problem articulation, and social capital. *Adaptability*, a crucial concept in ACM, refers to the ability people, networks, and institutions have to accept ecological and social changes and have flexibility (Armitage et al., 2009). *Flexibility*, for social relations and environmental management requires feedback learning to address uncertainty at both social and institutional learning levels (Berkes 2012).

Within ACM, knowledge is seen as that which is exchanged through a process of *social learning* and an experiential process of "learning by doing" (Armitage et al., 2009). ACM represents IK as possessing a continuity and cumulative acquisition of knowledge over a long time-period exercised through practical experience (Butler, 2006). It is based on acute observations and sophisticated knowledge that indigenous people have of their environment that is both evolving and current (Usher, 2000; Berkes, 2012). ACM proponents argue similarly to expressions in IK, that ACM supports a dynamic view of ecosystems under which land-use is presented as one of many processes of ecological cycles

of renewal and whereby resiliency is an important factor for understanding an ecosystem's ability to adapt to change without altering its equilibrium. In addition, ACM assumes, as IK asserts, that nature cannot be controlled and brings about uncertainty and unpredictability (Berkes, 2012)

According to ACM, social networks between communities and institutions need to incorporate various forms of knowledge to necessarily identify, contextualize, and analyze challenges in environmental management (Armitage et al., 2009; Berkes, 2009; Kristofferson & Berkes, 2005; Parlee & Berkes, 2006; Plummer, 2009). IK, in particular is a crucial tool to be supported through these social networks (Armitage et al., 2009; Kristofferson & Berkes, 2005; Parlee & Berkes, 2006). Social and political institutional imbalances, through both formal and *informal practices*, affect access and hinder resource sharing and knowledge transformation. Governance inherently has social and ecological uncertainties. For example, social capital is measured differently among communities and with that, such capital can be lost in cross-social network interactions. Proponents of ACM argue adaptability and collaboration in management require measures of flexibility, social learning through knowledge exchange, social network building, and measures for establishing cross-network social capital. Through such efforts IK can be integrated making environmental management more robust, holistic, and successful.

3) Indigenist Theory

There are key aspects of indigenist theory that make it both structured as a research approach as well as provides insights on integration of IK into environmental management policies and decisions. The concepts of indigenist theory are drawn from observations as they occur in situations that are highly ethically structured. For example, human-wildlife interactions are interpreted as spiritual meetings between equal agents; therefore, any observations made during such interactions are imbued with overtones of the spiritual and social norms relevant to the encounter. Concepts employed by indigenist theory function to not only explain and relate phenomenon, they also reinforce the sort of inter and intra personal morals with which knowledge, according to indigenist theory, ought to be handled. It is a way to contextualize research itself.

Indigenist theory is a framework developed to guide research with indigenous communities. One of indigenist theory's central tasks is to develop a research theory that is

consistent with the experiences of the indigenous community that the research includes. Furthermore, the research theory must maintain this consistency while forming a bridge to research practices that are congruent with the other research institutions, universities for example, also involved in the research processes. When working with indigenous populations one should engage in a research process that reflects the cultural worldview of the participants (Struthers, 2001). Like the prescriptions of ACM, research practices that incorporate indigenist theory facilitate collaborative work through ameliorating any of the imbalances of social and political capital that can occur when one community's knowledge is de-contextualized by another group. This is especially important when one considers the degree to which, under indigenist theory, knowledge is imbued with a context of ethical norms for its collection and dissemination. Furthermore, indigenous communities want research and its design to contribute to their self-determination and liberation struggles, as it is defined and controlled by their communities (Wilson, 2008). Here, indigenist theory can function as a corrective measure for research practices that overlook important insights and contributions regarding how indigenous people conceptualize human relationships to the landscape.

Although, researchers may not have been embedded in indigenous communities' epistemologies, an active role can be taken to develop an understanding for indigenist concepts and principles throughout the research process. Indigenist theory is, " a philosophy that anyone can choose to use rather than claiming any sort of racial exclusivity" (S. Wilson, personal communication, September 18, 2012). Non-indigenous researchers using the approach reconstruct the research process by shifting the control from the researcher to the community (Denzin et al., 2008; Kovach, 2009; Tuhiwai-Smith, 2012).

Indigenist theory is structured on IK principles. Because IK principles vary among cultures, when speaking of indigenist theory *per se* it is more appropriate to speak of the scope, or form, of indigenist theory, rather than any particular, context-sensitive specific content its local application may include. It is important to understand indigenist theory is not a pan-indigenous theory, or a syncretism of the diverse range of indigenous spiritual practices; instead, indigenist theory is a general framework that facilitates co-generating research with indigenous community members based on their unique ontological and epistemic experiences. Indigenist theory necessarily must be adapted to the local context in

which it is to be used. As Kovach (2009) explains, IK can never be standardized because it is in relation to both person and place. Nevertheless, indigenist theory does present a body of concepts, and propositions meant to introduce an awareness and sensitivity to the specific ways in which indigenous knowledge systems relate to the landscape. Therefore, a full articulation of the scope of indigenist theory requires initial familiarity with some general ontological and epistemological claims that form the bases of IK.

a) Key concepts & propositions of IK

Indigenist theory critiques Cartesian approaches to science that necessitate ontological principles involving a nature-culture dichotomy, objectivity, material reductionism, and secularization of knowledge (Frey et al., 2001, Kovach, 2009; Tuhiwai-Smith, 2012; Wilson, 2008). These Cartesian approaches separate nature in a hierarchical manner from humans, distinguishing humans as the sole agents who posses the ability to understand, predict, and control a passively viewed nature. Through such approaches, knowledge is gained by striving for objectivity under ideal circumstances where objects are uninfluenced by inquiry. As such, within these approaches there is a promotion of material reductionism, the claim that the ultimate reality is a material reality that can be broken down into measurable or analyzable parts. For example, Guba & Lincoln claim that these characteristics are foundational in positivist paradigms (1994). Positivist and post-positivist forms of realism, both naïve and critical, assume an objective reality exists; while critical realism acknowledges reality can only be imperfectly apprehended due to, “flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena” (Guba & Lincoln, 1994, p.110). Here, knowledge presents itself as a state of the knower, the possession of which does not necessarily affect the known "object of research." Within such approaches, knowledge is possessed even when its possession does not motivate reciprocity toward the known object as a partner in the knowledge relation.

In contrast to Cartesian approaches, indigenous communities often adhere to a process of *coming to know* that is based on tenets of equality among all beings, including what a Cartesian would call the "object of research." In many IK systems, the world is viewed as being imbued with spirit and reality is experienced as in the making. Reciprocity among relationships is a precondition for entering a knowledge-imbued relationship with any aspect of the process that is reality (Cajete, 1999b). IK is approached through the

intellect, intuition, and senses (Cordero, 1995) and it is egalitarian, relational, and its structure supports inclusion and wholeness (Kovach, 2009). It is often described as in conjunction with a feeling, something the heart tells, or an intuitive experience involving the spiritual. Frey et al. (2012) refer to it as a transitory intersection of participants. Those participating include humans, animals, plants, rocks, water, mountains, streams, spirits, ancestors, everything, all beings within temporal and spatial kinship. All of these things are assumed to have the potential for an active, rather than merely passive, role in processes of *coming to know*.

An operative difference between these approaches is the degree of emotion and motivation toward spiritual engagement and reciprocity accompanied by knowledge. The form knowledge takes is, in this regard, narrower as it has more specificity than when it is represented under Cartesian approaches, which tend to be indifferent to the subjective motivational salience of knowledge. However, in another sense, IK constitutes a broader category than knowledge in the purely Cartesian sense. There are many ways to enter into a "coming to know" relationship with the world that can present a form of IK. For example, indigenist theory claims that IK is transmitted through a multitude of sources including, traditional stories, special interactions with non-human plants, animals, and objects, and revelations that include dreams, visions, cellular memory, and intuition (Steinhauer, 2002).

As indigenist theorists argue, indigenous ontological principles are based on the premise that all beings are relational. The concept of *relationality* is defined as the relationships among all humans, place i.e., land, animals, the cosmos, and knowledge. There are no distinctions between relationships among people and those with land, both are considered sacred (Wilson, 2008). In short, all of existence is conceived of in communal terms. *Relationality* is wholly integrated within everything; there is an epistemological interrelationship between people, place, language, and animals influencing the act of *coming to know* (Cajete, 1999b; Kovach, 2009). This *relationality* extends beyond the mechanistic relationality possible within purely physical systems. Rather, ontological principles are premised on the idea that all things are personally related and therefore fall under the domain of relevant social and ethical principles, such as respect and reciprocity.

Reality is a set of relationships that come in various forms (Wilson, 2008). Knowledge, then, not only describes a certain awareness of reality, or agent neutral facts,

but also an awareness of certain relationships one has with aspects of that reality. Steinhauer (2002) states knowledge is relational, “it is a relationship with all of creation” and is shared with all of creation. We go about knowing reality by looking at the relationships among beings, developing "relational knowledge" systems. Within indigenist epistemological principles, “knowledge is seen as belonging to the cosmos of which we are a part and where researchers are only the interpreters of this knowledge” (Wilson, 2008, p. 74). As such, knowledge is always partial and is never complete. In this way, reality is known through understanding our being embedded in concrete relationships with others e.g. animals, mountains, or people and not in terms of abstraction.

Through the concepts *place* or *land*, indigenist knowledge conveys the epistemic function of relationships with one’s surroundings. *Land* is described as place, environment, reality, and the space one is embedded in. *Place* is the distance, space, or relationship between the environment and ourselves (Low, 2003; Wilson, 2008). Place is alive and is imbued with spirit and teachers (Kovach, 2009). The notion of landscape as opposed to environment captures a reality inclusive of the dynamic and spiritual relationships it is imbued with. The landscape acts as a pre-condition for the formation of any particular coming to know relation, and is thus identified as a necessary constituent of any given act of knowing. Take for example the following oral tradition told by a Nez Perce elder about a landmark where a great council of animals gathered to be given their roles in life and to establish how they would prepare the world, make sacrifices and teach the humans to come:

> So in this concept or story, all the animal people had to come up and be qualified to serve or help the human beings, when the human beings come. This is way before the human beings first came. So they're asked to come out and demonstrate the way they wanted to live and act and be. And they would be given a name, and they would say, I will provide something for the human beings when they come. And so all the animal people did that. And this was all done in Nez Perce, of course, and grizzly bear would be "grizzly bear", wolf would be "wolf", and elk would be "elk", and moose "moose" and so forth. And the ducks and the geese and the eagle, salmon and trout, spiders, you know, ants, and everything all got a name, and they would contribute someway to help the human beings.
>
> Well, Coyote, he was the last one to show up, he just barely made the meeting. But the other people who came after him, they got changed to stone, and there's these stones going up this ravine over here, kinda shaped like haystacks. Well, they’re the ones who came late to the meeting, they didn't

> know what was going on, so they became stones. And so this all happened, and Coyote just barely made the meeting. And he was asked, well who do you want to be, how do you want to live and act? So he says, I want to be Grizzly Bear. Well you can't be, Grizzly Bear's already been taken. Well I want to be Eagle. Well, eagle's already been taken. So he didn't know what to do, he couldn't do anything. He'd just go out there and stumble around, he didn't' know how he wanted to be. So the Creator said I'll take pity on you, and you'll be just like the human beings when the human beings come, all the desires, wants, faults, and you'll even get killed because of your stupidity. But I'll give you the gift to come back to life. And you'll also be able to change and modify things on earth, to fit the needs, or whatever you want to do. And so he was happy, you know, he got a name, "Coyote", "*Iceyéye*. " Yeah, but he was just going to be grey, he wasn't going to be any other color.
>
> So there, after the meeting broke up, he traveled the world, and did his business, and created the *Nimíipuu* up here, by Kamiah, after he killed the monster. So I'm giving you the real short version of the story, otherwise I'd describe every animal, bird and insect, fish that I knew, to make that story last a long time…So there again you have these landmarks that create this sense of place. That's where we belong, this is where we were created, this is where we should live. And that's why we still live here, today. Because we have this sense of place; we don't want to leave it
> (Nez Pere tribal elder, personal communication, October 5, 2013)

This oral tradition illustrates the spiritually imbued connection the Nez Perce have with the landscape. A landmark of stones tells of the sacrifices animals make for the survival of the *Nimíipuu*. The landscape holds wisdom that re-reminds the Nez Perce, for the generations to come, of their relationships with all. Landscapes connect indigenous communities to places multi-generationally and are the matrixes in which oral traditions such as gathering, hunting, and storytelling are embedded. For this reason, a key IK proposition is that "knowledge sits in places."

The concept of *spirituality* is of particular importance to understanding IK attachment to the landscape. *Spirituality* refers to one's internal sense of connection to the universe (Cajete, 1999b). Any exercise that increases connection and builds relationships such as gathering *qémes*, *Camassia quamash*, camas, or dancing in powwow is *spiritual* (Wilson, 2008). The things, or more appropriately, partners we interact with during spiritual practices, are referred to as *sacred*. Sacred things are valued for their teachings and importance. Sacred things can be concrete or abstract objects and can include such things as concepts, metaphors, symbols, relationships, or physical beings. That which is sacred is

highly regarded and respected. For example, the sacred tree is a symbolic metaphor for an ecological Native American philosophy of stewardship. Sacred landscapes contain teachings of "remembering to re-member," one's *relationality* and to care for these life sustaining places, and re-render its meaningfulness (Cajete, 1999a).

Coming to know relationships that precipitate forms of IK involve active relationships and thus carry a degree of motivational saliency. Importantly, for knowledge to be genuine it must occur in a relationship of mutual respect; therefore, the construct of *reciprocity* is typically provided to describe a norm regarding epistemic processes. *Reciprocity* refers to a respect and giving back to all your relations (Cajete, 1999a, 1999b; Kovach, 2009). The Nez Perce concept of *téḱe*, to give and share (food with others) (Aoki, 1994) is an expression of this sense of *reciprocity*. Téḱe is exemplified in the above Nez Perce oral tradition about the council in which animals and others gave parts of themselves as food for the Nez Perce who would rely on these sacrifices for survival. Research implications of such a concept can be providing food during interviews and meetings to generate a more meaningful process.

Indigenous people and their customs are shaped by the landscape and their relationships. Their spiritual, emotional, and physical relationships to the landscape give them their responsibility for reciprocity (Cajete, 1999a, 1999b; Kovach, 2009; Wilson, 2008). In this way, nature is perceived as possessing language, culture, and the ability to assess their representation. Spirituality is the cultural mechanism for language by which communication occurs (Cajete, 1999b; Kovach, 2009). Relationships with nature, like those with sacred places or animals, such as coyotes, expressed through oral traditions or experiences enable communication to occur. For example, when Coyote crosses a person's path and stops to look at her, Coyote is speaking to the person, and is giving her a message. Spirituality allows the person to decode that message and understand Coyote.

In addition, the landscape allows space for the transverse of time and provides an immediate connection to ancestors, reminding one of who they are and linking the self to one's kinship group (Kovach, 2009). One way this occurs is because landscapes hold the knowledge that is transmitted through spiritual ceremonies like sun dance, re-telling oral traditions, or gathering *ɬitán*, *Lewisia rediviva*, bitterroot. Ceremonies and oral traditions bridge the space between the landscape and people, reducing the distance, strengthening the

sacred relationship shared, and promoting collective responsibility and stewardship (Wilson, 2008). Re-dancing or re-membering stories enable a spiritual experience i.e., the bridging, in which the world is literally perpetuated and rendered meaningful (Frey et al., 2012). For example, the Coeur d'Alene Lake is said to receive its blueness from the spoken words of its creation story (Frey, 1995; Frey et al., 2001).

Spirituality and the sacred enables participants to transcend linear time, connecting them with other beings and ancestors. Such a principle has many expressions. The ability for time to be transcended is exemplified in some Native American traditions of telling stories after the first frost and before the spring thaw to ensure that certain animals depicted would not visit because they were hibernating. The Nez Perce seasonal round, *nimíipuum inmiiwit,* is a symbolic expression of cyclical and relational time. It depicts landscape changes occurring as the months and seasons progress throughout the elevations. The name of the months refer to specific features in the landscape and tell the Nez Perce what practices they should be doing at that time; for example the fishing of salmon when they arrive. The Nez Perce experience involving the transcendence of time through the building of a connection with a *wéeyekin*, or a tutelary also exemplifies this spirituality.

In exploring how IK principles take shape in community and landscape specific contexts, we can begin to gain an understanding of how these principles may conflict with the assumptions held by researchers and environmental managers alike. Within indigenous theory, IK is conceived of as inherently demanding reciprocity among those who collaborate in its disclosure, presentation, and application. Conversely, this entails that failure to reciprocate while researching IK constitutes an *epistemic failure of research* because a lack of reciprocity betrays a lack of fully grasping the indigenous knowledge at which the research inquiry aims.

When knowledge is conceived of under more Cartesian paradigms, there is potential for a lack of reciprocity. This lack of reciprocity can take the form of exploitation of indigenous groups by academic researchers (Deloria, 1997; Deloria & Wildcat, 2001; Tuhiwai-Smith, 2012).As indigenist theory often exposes the negative effects of positivist and similar approaches on research with indigenous communities, it is crucial to remember the context in which these statements are made. Indigenist theorists would not argue these approaches to science are without value. They contribute to and enable great advances in

research. However, indigenist theorists do argue that such approaches combined with a failure to acknowledge indigenous ontological, epistemological, and axiological perspectives in research with indigenous communities is problematic. The following section elaborates on the discontinuities that can arise out of such approaches.

According to indigenist theory, approaches to gaining knowledge "based on a rationalist, secular paradigm, discounts the possibility that knowledge arises from happenings that cannot be explained through reductionist means" (Kovach, 2009, p.78). An example of such would be at the landmark of stones, the place of the council where the late arriving animals were turned to stone. Abstracting a single object of inquiry from its context in order to make definite claims about its intrinsic properties can be problematic because it neglects the affects of relationships on the object (Wilson, 2008). As such, "positivist approaches, with their propositions of neutrality and their service to a political and economic agenda of capital [capitalism], philosophically conflict with indigenous social values" (Kovach, 2009, p. 78). For example under such approaches it may be acceptable for a researcher to collect Cartesian knowledge and then use this knowledge in a way that would result in personal career gain that is not shared with the participating community. Such an example depicts the experiences many Native American and First Nations communities have had with external researchers and resource managers. Standing Rock Sioux scholar, Vine Deloria Jr. (1969, 1997), criticizes researchers for such approaches, arguing that such endeavors often result in the sole benefit of external entities and rarely for the participating community.

Indigenist theory, as presented here, does not see exploitative research as merely a shortcoming of general research ethics, but rather as a failure to acknowledge the subjective aspects of the *coming to know* relationship constitutive of IK. For example, in striving for a relationship of objectivity with, say a salmon, either through research or management, the researcher neglects the subjective relationship with the salmon, thus neglecting the duty of reciprocity that comes from having a personal relationship with that salmon.

For the *Nimíipuu,* in embracing a subjective relationship with salmon, one is reminded of the sacrifice salmon made as re-minded in the council oral tradition affecting their actions. An example of such would be a *Nimíipuu* student's decision to utilize all of the tissue of the steelhead that had data potential for research when in which the tissue he

needed for his thesis was only a small amount. In his remarks the student explained that the steelhead had made a sacrifice and that the sacrifice must be honored by not wasting needlessly. He went on to explain with Nez Perce tribal management, "A lot of our viewpoints, especially when it comes to management, kind of gets into that relationship with them, its not just fish, its not just a deer to eat, it's a relative of sorts" (Nez Perce tribal member D, personal communication, September 26, 2013). Indigenist theory acknowledges a direct subjective experience within science; predicated by connectivity to nature, yielding an awareness of the subtle qualities of nature that guides scientific observation and experiences (Cajete, 1999b). Indigenist theory argues these insights are lost when IK is translated into Cartesian forms of knowledge. As the Nez Perce tribal member explained, the landscape is made up of "relatives of sorts."

Indigenist theory is not solely an intellectual framework, but it must also be understood for its practical manifestations involving reciprocity (Kovach, 2009). In participating in research with indigenous communities we too as researchers contribute to the perpetuation of the world through the re-telling or re-transmitting of oral traditions. Indigenist researchers must both understand and respect this proposition. In addition, indigenist theory reflects reciprocity by encouraging the development of inquiries that will benefit the community. As such, giving back in the form of adopting or utilizing components of an indigenist framework assists in maintaining and renewing connections with ancestors for indigenous communities (Wilson, 2008).

4) Indigenist Theory & Environmental Management

Accelerating pressures on the landscape demand a growing interest in understanding the human-environment nexus (Ingold, 2011; Kosek, 2006; Knight, 2000; Lindquist, 2000; Wildcat, 2009). Indigenous epistemologies provide knowledge regarding the dynamics of our relationships with the landscape. This knowledge, with its experiences with ecological conditions, pre and post contact, and with long-term experiences with indicators of ecological health, is increasingly important in environmental management approaches (Lansing, 1991; Menzies, 2006; Turner et al., 2000). As consultations and collaboration with indigenous communities multiply (Usher, 2000), cultural and natural resource managers' accessibility to a dynamic understanding of community and landscape specific IK principles and training in adaptive collaborative strategies is needed.

The previous discussion of IK as contextualized by indigenist theory contributes to a more expansive conceptualization of IK and its expressions among indigenous communities' than put forth by ACM theorists. An understanding of indigenist theory not only contextualizes IK for environmental managers, but its notions of *relationality* and *reciprocity* promote collaboration. In addition, indigenist theory, further contributes to understanding the existing paradigmatic differences between indigenous communities and environmental managers. Highlighted below are the political and historical contexts that affect relations between indigenous communities and environmental managers further. To support collaboration with indigenous communities, managers must be cognizant of the affects of historical changes, tribal sovereignty, and self-determination on IK and its use as a political discourse. With that being said, ACM can assist the building of social networks among indigenous communities and environmental managers.

Combined, indigenist theory and ACM promotes using the local institutions and *informal practices* valid for indigenous communities (Cajete, 1999b; Deloria & Wildcat, 2001; Denzin et al., 2008; Frey, 2001, 2012; Four Arrows, 2008; Ingold, 2011; Kovach, 2009; Tuhiwai-Smith, 2012; Webber-Pillwax, 2001; Wilson, 2008). The following addresses a series of questions concerning IK and its use in environmental management. The discussion does so by looking at examples of attempts at IK integration into environmental management, exposing the paradigmatic, structural, historical, and political barriers. Following a description and discussion of these examples are recommendations on how to improve these efforts using indigenist theory and ACM prescriptions. In conclusion, this section helps to illustrate that rather than IK integration, environmental managers and indigenous communities should work toward a process of knowledge co-generation within an adaptive collaborative management structure.

a) What paradigmatic and structural differences affect IK integration?

The Forest Service separates natural and cultural resource management under different departments. Cultural resource management as practiced under the Forest Service system involves consulting managers on the presence or absence of archaeological resources within a project area for proposed actions. During this process, cultural resource managers and district rangers attend tribal consultations, required under Section 106 of the National Historic Preservation Act (NHPA). The role of cultural resource managers as outlined by

Forest Plans and agency guidelines is to point out the presence of archaeological resources within the proposed project areas and advise on the effects the project will have on those resources. The resultant reports are shared with the State Historic Preservation Office (SHPO) for concurrence on the potential effects and tribal entities for consultation regarding the project and its effects on archaeological resources. After SHPO review and tribal consultations, district rangers within the Forest make final management decisions.

During the consultation process, tribal members express concerns that go beyond conventional notions of natural and cultural resources. Natural and cultural resources are managed by federal agencies under objectivist and commodified perspectives of the landscape, whereas, tribal participants' expressions of natural and cultural resources during consultations are framed through IK in the form of *relationality,* ethical obligation, and reciprocity. This means that an important cultural resource is the indigenous community's approach to environmental management. The result of such discontinuity between structures and perceptions generates problems during consultations. Environmental managers often fail to understand the principles behind IK and structural, training, and role barriers prohibit cultural resource managers from potentially facilitating an awareness of such principles.

The following example from a tribal consultation I attended with an Idaho national forest in 2012 illustrates these barriers. When a project extending snow-grooming permits for snowmobile use was proposed resource managers assumed tribal members would not object to the project as no archaeological resources were to be impacted. However, tribal representatives raised concerns over the project regarding its effects to wolverines and their habitat. Wolverine research regarding winter habitat was underway, and although not conclusive, the research indicated that wolverines were still present in high impact stress areas. Such a research outcome was not satisfactory as the tribal representative argued American Indians live in high impact stress areas too and that such conditions are not acceptable for them nor are they for wolverines. The representative went on to say that wolverines are regarded as family and the Shoshone-Paiute speak for those in need, especially when "those in need" are family members. This elder viewed himself and the Tribe as having important relations with wolverines, relations governed by certain forms of ethical obligation and reciprocity. For this elder, speaking on behalf of wolverines was highly appropriate during consultation.

After the consultation, environmental managers did not understand how the research results for wolverines could be perceived as insufficient. Environmental managers viewed the research results as complete as they illustrated wolverines were located in high stress areas, as such presence was the major factor of concern for them. For the tribal participants, determining wolverine presence was not the only criterion for the completeness of the survey; importantly, another necessary aspect of the survey was the objective of maintaining *relationality* with, and respect toward, wolverines. Because the wolverine research did not factor in such concerns, tribal members questioned the validity of the survey, viewing it as incomplete. Concerns like these can go unresolved during consultations due to barriers at both the paradigmatic and structural levels.

Differing conceptions of the natural world can imply different and potentially mutually exclusive land-use practices. These differences between groups contribute to the presence of environmental conflict on multiple levels (Joubert & Davidson, 2010). Structures within the Forest Service system impact the potential transmission of IK to managers, as resources are problematically separated as cultural and natural and are perceived of as objective resources without requiring ethical obligation. At a cultural awareness workshop later in 2012 with the Forest the same tribal elder explained nature-culture dichotomies and therefore natural and cultural resource separations did not exist in their tribal worldview. Despite resultant awareness of this expression of IK, the Forest Service system does not promote natural-cultural resource management connectivity. Nor does the system promote cultural resource managers to expand beyond conventional archaeological resource management to assistant in IK awareness and integration. To address cultural concerns that expand beyond archaeological resources, many tribes are requesting ethnographic and cultural analysis as part of compliance for Section 106. However, existing Forest management mandates require consultation, but not a collaborative decision-making process that could contribute to a support for such concerns by indigenous communities.

In addition to these structural barriers, Nadasdy (2003a) points out that IK is often only incorporated into management strategies if it is in agreement with existing biological data. Nadasdy presents his assessment by describing the Kluane First Nations' involvement in the Ruby Range Sheep Steering Committee in Burwash Landing, Yukon. The committee

was comprised of First Nations, federal government employees, territorial government employees, local big game outfitters, and environmental group representatives. It was formed to address management of the dwindling numbers and management of Ruby Range sheep, an important and significant ungulate to the area. The sheep are an economically important draw for outfitting services and are a continual major source of subsistence with cultural significance for the Kluane (Nadasdy, 2003b).

The committee's objectives included incorporating both scientific knowledge and IK into a management strategy for Ruby Range sheep. The Kluane and wildlife biologists agreed that sheep numbers were dropping in the Yukon. While biologists suggested this decrease was due to weather related changes in habitat conditions; Kluane elders and hunters viewed this argument as not only wrong, but as disrespectful to the Ruby Range sheep. Such a suggestion was perceived of as wrong because it neglected to acknowledge the intelligence and ability of the sheep to survive changes in weather conditions (Nadasdy, 2003b). For example, one possible way to make this acknowledgment would be to note, and account for, the resiliency habits of the sheep due to changes in habitat. Such acknowledgement, however, was absent in the Ruby Range collaborative process. This disagreement subsequently contributed to the undermining of the collaborative process. Considering how knowledge expresses relationships with animals on the landscape could have prevented this by ensuring that each group's views were presented in a culturally sensitive manner.

Divides further ensued as western conceptualization and practice of natural resource management, being relatively recent in North America is often externally formulated and rarely place specific. In contrast, IK involves the knowledge claims of a kinship group that possesses a lifetime of experience in the surrounding landscape (Usher, 2000). More than isolated and unconnected personal observations, IK is cumulative, shared, and validated by a community's practical testing for accuracy. For example, assessments about the landscape are triangulated between the experiences of various peers and the culturally preserved historical context and information about the landscape. As such, IK depends on diachronic experiences, while "biologists" and conventional science's interface with the landscape occurs in "static and temporally isolated 'snapshots'" (Nadasdy, 2003a, 2003b; Usher, 2000). These discrepancies lead to each group questioning the validity and quality of the other's knowledge.

Environmental managers often neglect indigenous epistemologies (Joubert & Davidson 2010, Sherman 2010), that is processes of *coming to know*, and establish a degree to which IK is accepted and integrated (Kristofferson & Berkes 2005, Nadasdy 2003a, West et al. 2006). Knowledge-integration assumes that the incorporation of IK can be done within the existing structures of government led natural resource management (Nadasdy, 2003a). This assumption ignores paradigmatic differences, resultant structures, and their affects on landscape perceptions in ways susceptible to the same criticisms indigenist theorists level at Cartesian academic practices. Through the integration process, resource managers perceive IK as just another form of "data". Such a conception contrasts with viewing IK as teachings. Through the process of viewing teachings as "data," *relationality*, experiences, values, ethical obligations, and practices are decontextualized and translated into forms that are compatible with bureaucratic management processes (Nadasdy, 2003a). This process can lead to alteration of IK content, so that it no longer resembles its intended underlying principles. Such an outcome can result in indigenous communities either denying further collaboration or a diminishing faith in the collaborative process.

i) Recommendations for overcoming paradigmatic and structural barriers:

As illustrated above, IK cannot always fit within the existing structure of 'cultural' or 'natural' resource management. Packaging conventional scientific knowledge or IK to fit in a ready-made structure or blending or synthesizing the two can result in de-contextualization, neglect of ethical obligations, and a loss of integrity of the quality of knowledge (Berkes, 2009). Collaborative processes among indigenous communities and environmental managers should not be approached as an incorporation of compartmentalized components of knowledge, scientific or IK, but as a process of knowledge co-generation. Under indigenist theory, just as co-generation shifts the control from the researcher to all the participants, adapted under environmental management, control is individually distributed among all those participating.

Co-generated knowledge occurs under new structures for management. Ecosystem-level approaches are widely integrated and accepted into environmental management by recognizing connectivity among landscape features. A similar structural process can be adopted for natural and cultural resources under co-generation. Such a

structure would recognize IK principles of holism and *relationality* among all features of a landscape including, plants, animals, water, weather conditions, periods of ecosystem succession, land uses, and tribal practices.

As indigenist theorists explain, IK recognizes equality among all beings; all those participating in co-generation are equal. Such equality helps to promote social capital and social networks within management as prompted under ACM. Co-generating also involves a process in which participants' acknowledge personal assumptions or bias for trust building (Berkes, 2009). Measures of flexibility and adaptability as proposed by ACM, and a sense of reciprocity as suggested by IK are necessary for co-participants to share knowledge. Collaborators are not required to compromise their worldviews, as they may be forced under an integration process. Instead through such a process of knowledge co-generation, the paradigmatic differences among participants are revealed and contextualized to promote a mutual respect. A process of co-generating knowledge requires an understanding that just as relationships are never complete, knowledge itself is never complete, an IK and ACM epistemological premise that enables flexibility and adaptability (Berkes, 2012). As such, a process of knowledge co-generation encourages resolutions to paradigmatic differences through network building and the development of social capital and trust.

b) What political and historical factors affect IK and collaboration with indigenous communities?

With their research, Sherman and others (2010) describe how Lakota households on the Pine Ridge Reservation struggle with environmental conflicts. Illustrated are the politically charged structural barriers from tribal, state, and federal land policies. Conflicts stem from forms of indigenous marginalization by external entities resulting in degraded environmental, social, and cultural conditions. Despite these conditions, there is an immense desire among Lakota families to restore ecological wildness through restoring native ecological systems. The major barriers to Lakota communities' involvement with the conditions of the local landscape are formal legal controls and restrictions. These externally imposed regulations lead to reactionary behaviors from the Lakota community that result in further degradation of the landscape through extensive resource extraction. Major conflicts occur between commoditized land-use views and expressions of a 'traditional' Lakota approach to improve social and land conditions (Sherman, et al., 2010).

'Traditional' Lakota approaches express a practical environmentalism that comes from practice within rather than abstraction from the landscape that maintains their connection to place (Sherman et al., 2010). Such a view can also be expressed under IK as seeing oneself as a part of a system and not separated from it. Contextualized under IK concepts, Lakota tribal members use oral traditions and practices to instill environmental stewardship among younger generations and enhance community solidarity and sustainability of practices. Such a process is contextualized under IK's process of "remembering to re-member." As Frey and others (2012), Kovach (2009), and Wilson (2008) indicate, engagement in oral traditions connects indigenous communities to all their relations and promotes reciprocity within those relationships. The discontinuity between excessive resource extractions, commodification of environmental features, and a practical environmentalism is an indicator of the historical changes that have occurred among Lakota tribal members. In this case study, outside regulations impose an external structure on Lakota communities' IK and connection to the land that negatively affect their local socio-ecological relations.

i) Recommendations for overcoming political and historical factors:

Sherman and others (2010) demonstrate that institutional structures, such as legal controls and restrictions to Lakota land-use practices and the ensuing conflicts, obstruct the potential for incorporation of IK into management strategies. Indigenist theory explains how one relates to knowledge expresses how one relates to the group that presents it (Tuhiwai-Smith, 2012). Efforts to share knowledge between Lakota communities and external agencies are tainted by the negative relations between one another. Colonization has resulted in commodified views of the landscape, which clash with IK principles and cause conflict among and between Lakota communities and external land managers. The effects of colonization on IK are widespread; therefore, "a critical recognition of the impacts of colonialism on Indigenous knowledge is crucial if there is to be any successful integration into resource management" (Butler, 2006, p. 107). The historical and political factors that effect IK and tribal membership-external managers relations need to be exposed; through co-generation of knowledge and social networking, groups can begin to overcome these barriers in the realm of environmental management.

Oversimplified and uncritical promotion of IK's use in external agencies' environmental management is both practically and politically dangerous. Recognition among collaborating participants of colonization's impacts in the form of historical changes, cultural interactions, and power relations on IK as the Lakota case exemplifies is a good step toward building intra-group social capital. Furthermore, all participants in environmental management need to understand the history of resource use and access and the impacts on the generation and preservation of both IK and the landscape (Butler, 2006). Discontinuities among indigenous communities and their expressions of IK are partially due to external political forces. An extensive understanding of treaty rights, tribal sovereignty, and self-determination efforts among environmental managers is needed to redirect the discourse from negative effects to one that emphasizes problem solving, solutions, and successes. An awareness of such provides a better platform from which social networks, trust, and social capital can be built between indigenous communities and environmental managers.

c) What are some of the land management contexts that IK can contribute to?

IK content and processes such as *coming to know* and *relationality* augment environmental management understandings and strategies because of the characteristic practices of indigenous communities. A process of *coming to know* in which there is a natural drive to learn especially through direct experience (Cajete, 1999b) provides knowledge pertaining to human-landscape co-dependency relationships. Q*éḿes*, *Camassia quamash*, prairies that Nez Perce cannot access, due to private property boundaries and other issues, for gathering have resulted in diminished *qéḿes* in both bulb size and numbers. Gathering practices provide aeration and other disturbances that improve bulb productivity. Landscapes such as *qéḿes* prairies equally, "are tied to our physical health, our spiritual health, our mental health, they are basically our survival" (Nez Perce tribal member B, personal communication, September 11, 2013). Knowledge of this Nez Perce expression of IK among environmental managers could encourage facilitating Nez Perce access to *qéḿes* prairies; such support would facilitate landscape restoration efforts needed under many Forest Plan directives, social networking and knowledge co-generation among Nez Perce and environmental managers, and *relationality* between the Nez Perce and their homelands.

In addition to insights on human-landscape co-dependency, IK can contribute greatly to environmental assessment by providing a holistic scope of pre-historic baseline conditions,

local ecological processes, and ecological health for a finer and more detailed geographical area (Usher, 2000). Indigenous communities' practices span a large area and time period. Their knowledge correlates to a broad geographical and temporal scope because indigenous communities' treaty rights enable its membership to be less bounded by legal property rights and restricted harvesting regulations employed by federal and state agencies. A greater diversity of practices and correlating IK is expressed in the degree of biocultural diversity.

Indigenous communities also work within a communal and sharing framework, like the Nez Perce Tribe's notion of *teḱe*, within their communities. This contributes to a greater degree of shared knowledge and the ability for social sanctions, reinforced through social capital, for stewardship purposes. An example of such would be the Nez Perce Tribe's Salmon Chief role along the Columbia River under which salmon harvesting regulations were employed to allow fish passage to upriver communities (Nez Perce tribal member D, personal communication, September 26, 2013). This role was employed prior to the destruction of Celilo Falls and U.S. government campaigns that lead to its dismissal. Such indigenous communities' *informal practices* can enhance environmental assessment as knowledge is shared, collectively created, and peer-reviewed.

Another example of a context that was successful for IK contributions to environmental assessment is Cree and Inuit communities in Canada's Territory of Nunavut increase of Arctic char numbers in Cambridge Bay. Artic Char are customarily a major food source for communities and are privately and commercially harvested. The James Bay Cree fisheries' traditional management practices are adapted to the local area and managed by land users. This management system relies on social sanctions that are embedded in an ethical context for decision-making (Kristofferson & Berkes, 2005).

Within the James Bay Cree fisheries, IK and ACM practices help to ensure sustainable harvesting. ACM is considered "the scientific analogue" of IK as it also integrates flexibility into management strategies and emphasizes practices that allow change and adaptability (Kristofferson and Berkes, 2005). Through this management approach a successful recovery plan for Arctic char stock was developed, restricting the char caught by non-First Nations anglers through regulations and utilizing internal community sanctions to restrict James Bay Cree and Inuit communities' harvesting.

Similarly, Teetl'it Gwich'in women in Northwest Territories, Canada, employ social sanctions for berry gathering practices. Social sanctions have functioned in indigenous societies since time immemorial and are measures of indigenous stewardship and *reciprocity*. The interrelationship between ecosystem dynamics and local institutions along with common property rules, an *informal practice*, all play out to regulate gathering. Regulations are employed as a result of a collective knowledge building process, like the knowledge co-generation process, through which in this case variation in berry density and the distribution of commons are evaluated. Such local *informal practices* are defined as rules-in-use being both adaptive and flexible to responses on the landscape and within the community (Parlee & Berkes, 2006).

Knowledge building is a process whereby experiences and individual and collective interpretation of those experiences occur among the commons to build local institutions. Indigenist theory would further argue knowledge building also relies heavily on *relationality*, understanding one's subjective relationship with both the landscape and community. *Relationality* entails ethical obligations to such relationships that motivate regulations on harvesting practices and a sharing ethic, like the Nez Perce concept of *téḱe*, that motivate actions that enable equal distribution among community members. The flexibility of commons rules is positively correlated to the abundance of berries (Parlee & Berkes, 2006). In times of scarcity, commons rules are more strictly enforced through social sanctions.

In addition to social sanctions involving land use practices there are also sanctions involving the cultural management of sacred landscapes. Recent top-down directives within the USFS encourage identification of sacred sites (USDA Office of Tribal Relations and USDA Forest Service, 2012). The following is a discussion of such efforts I was involved in from 2012-2013. Several rock cairn features, all within a 1.5 mile radius, were identified on an Idaho Forest landscape where a project to extend a motorized vehicle route was proposed. These sites were speculated to be associated with one another and to have significance among Idaho's Native American tribes. The proposed extended trail would increase the visitation and pressure within the area of the cairns. Informal consultations with three tribes were conducted and the result of which was the Nez Perce Tribe identifying the features as significant to their Tribe.

In an effort to develop an understanding of the significance of such features among Forest Service land managers and to encourage dialogue, land managers and Nez Perce Tribe representatives attended a field visit. The Forest Archaeologist explained that if the route were extended there would be no effect to the features, conceived of as archaeological resources. The Tribe's representative contested the expansion by explaining that the project would impact the relationship Nez Perce tribal members do, and could potentially, have with the landscape upon which the features lay because the sense of solitude and the soundscape afforded by these places would be impacted by the extension of the motorized route.

If the location described above is to be managed solely based on its archaeological value to the Forest then the integrity of Nez Perce IK and tribal relationships with the landscape will be lost through the pressures of the existing federal structure. Such structures can stifle acknowledgement of the areas' sacred nature. When considering the relational implications of the landscape, federal management strategies have to incorporate managing not just for physical or symbolical embodiments of a relationship, but also the relationship itself. If top-down directives address and encourage sacred landscape management at a local level it must entail a process of knowledge-cogeneration among collaborators. As such, this example illustrates the necessity for IK content, structures, and processes to be transmitted in order for land managers to understand, value, and protect the integrity and *relationality* of sacred landscapes.

i) Recommendations for contexts that facilitate IK contributions:

The previous examples illustrate how IK content, structures, and processes can enhance environmental management. Conventional natural resource management often oversimplifies complex relationships in harvesting systems and accumulates large amounts of data formed on conservative harvesting practices until a more complete biological understanding is achieved. In contrast, ACM acknowledges these uncertainties and identifies key ecosystem relationships that can provide measures for how features on the landscape will respond to different management and land-use practices (Kristofferson & Berkes, 2005). Q*émes* gathering, Arctic char harvesting, and berry gathering exemplified the *informal* practice and management strategies and the resultant landscape responses.

ACM utilizes elements of indigenous institutions and *informal practices* to adapt to the local area and land users. ACM's adaptive approach and environmental assessment

strategies, from an indigenist theory standpoint, are better positioned to understand and develop measures for knowledge co-generation because multiple processes, inclusive of local indigenous practices, can be supported. Such was the case with using social sanctions for indigenous communities and agency regulations for non-First Nations for harvesting. As illustrated in the examples, these approaches factor in elements of indigenous social structure whereby allocated decisions are communally made and shared and compliance is socially sanctioned. Such systems have a moral and ethical context under which separations of nature and culture are not made.

Specifically addressing cultural resource management, a knowledge co-generation process involving IK in Forest Service management is necessary for mangers to identify and conceptualize the protection of sacred landscapes. This requires an understanding of the underlying principles behind IK, such as *relationality*. It also requires land mangers building social networks and social capital with local indigenous communities so that IK is community specific and place based. Knowledge building, or the co-generation of knowledge must maintain the integrity of all knowledge forms and be used responsibly. This is especially important with IK related to the sacred and spirituality, as reluctance to share such information is great among indigenous communities because of the misuse and misunderstandings of such knowledge. Appropriate structures can be conceptualized and co-generated between land managers and tribal communities through ACM's proscriptions of social network building and the use of *informal practices*. Without integration of IK content, structures, and processes, indigenous sacred landscapes will not be managed in a way that reflect nor support indigenous communities' ways of living.

d) What strategies need to be adopted for IK a process of knowledge co-generation in environmental management?

Indigenist theory explains examining antecedent biases is an important aspect of research. It calls this examination self-locating. Self-locating, as described by Kovach's (2009) indigenist approach refers to the methodological process of all research participants becoming aware of their personal assumptions, paradigms, values, and biases. This process is also suitable within environmental management. It is important under acts of self-locating all expressions of knowledge need to be recognized as valuable (Cobb, 2011). It is also recommended that participants have an understanding for the political and historical factors

that influence IK, human-landscape relationships, create barriers, and empower participants. Throughout both processes, participants establish a rapport with one another, build trust, and create social networks.

Toward this end, workshops establish deliberate and facilitative methods for overcoming divisions due to paradigmatic or other differences. For example, distinctions between different forms of knowledge are often arbitrarily and mistakenly made (Berkes, 2009; Cobb, 2011; Raymond et al., 2010). These unproductive distinctions can be avoided through examining similarities within forms of knowledge through educational workshops and the co-generation of knowledge. While scientific knowledge is formally presented in written reports or presentations, the information is interpreted by individuals in terms of its relation to their existing knowledge and past experiences. Indicating knowledge always has relational and subjective components. A point which may be unacknowledged by its holder, yet is explicitly acknowledge by IK. Exposing such a point can foster a receptive attitude to knowledge co-generation . Attempts at knowledge co-generation need to actively promote dialogue on the different epistemological premises (Cobb, 2011) and their implications on the reliability and validation of knowledge claims (Raymond et al., 2010). Such issues that arise are exemplified by disagreements over snowmobile impacts on wolverines and weather condition changes on Ruby Range sheep.

Environmental management needs to follow an adaptive collaborative process co-generating knowledge together that facilitates a learning-by-doing, experiential-based, and knowledge building partnership and dialogue among indigenous communities and environmental managers (Berkes, 2012). Within the collaborative partnership environmental management preparation should occur to co-generate management objectives with an understanding of the project sideboards. Together participants establish the structures in which co-generated knowledge will form the management strategies. Co-generated knowledge is exercised through all *coming to know* approaches. Interpretation of experiences are co-generated. Measures of reciprocity are made throughout the whole process in which sharing, respect, humility, and giving is practiced. Adaptability and flexibility in understanding all perspectives and possible changes are exercised throughout the whole process that enables the collaboration.

Although such a suggested strategy for environmental management may seem idealistic, processes like the one prescribed occur in existing management structures. Many tribal management systems take into account the paradigms and approaches of both tribal member employees and non-tribal member employees. Structures in tribal environmental management are co-generated and cultural and natural resource distinctions are becoming increasingly blurred.

For example, the Coeur d'Alene Tribe's natural resource management program integrates IK into stream restoration projects by focusing efforts on facilitating beavers' habitat creation of dams. Coeur d'Alene elders and the Tribe's non-indigenous natural resource specialists co-generated a plan to focus resources on facilitating beavers' ecological role as opposed to placing efforts on streambed restoration itself. Elders IK about beavers, observed effects on the local ecosystems, and notions of streambed restoration contributed to the co-generated management project. Collaborators make note of the knowledge and lessons shared among participants and the desired results are evident on the landscape.

5) Conclusion

Environmental management can be approached in multiple ways. It can be approached from a paradigm whereby 'natural' and 'cultural' resources are separated. It can also be viewed within an indigenist framework that emphasizes the *relationality* and nexus between social, political, and environmental features. IK can best contribute to environmental management when indigenist theory suggests it is approached as a relation. Through understanding IK from an indigenous perspective, one becomes a participant and an active and engaged contributor. This not only entails understanding indigenist starting points, such as the epistemic necessity of addressing relationships within research and resource management. It also requires appreciating the ethical aspects of knowledge sharing, such as active reciprocity, and contextualizing IK within its political and historical influences. Both are necessary under indigenist theory and encouraged by ACM.

As indigenist theory suggests, predominant paradigms that guide research and environmental management often do not incorporate the ontological and epistemological principles of the involved participants and communities. Likewise, ACM theorists and practitioners argue IK integration into environmental management often extracts IK from

their context affecting its integrity and jeopardizing further collaboration with indigenous communities.

Challenges in IK integration into management practices arise partly due to an ignorance and neglect of historical changes, tribal-federal government relations, tribal sovereignty, and self-determinism. IK's application within applied research and environmental management programs and strategies is often decontextualized of its political influences. Historical changes due to colonization have affected not only IK content, but also the structures and processes through which IK is exercised. Discontinuities have affected IK's continued practice, but it has also enabled IK to become a political tool to legitimize indigenous communities' authority and place within environmental management. Differences between indigenous communities and federal environmental managers can hinder collaboration and communication between the two groups. IK is best holistically applied relying on both social and ecological understandings to exhibit a diachronic, practice-based, community-shared and tested knowledge that can work with conventional scientific management.

When IK is applied holistically, the approaches and structures developed through ACM are supported by IK. This involves acknowledging members in the community as the philosophers, theorists, experts, teachers, and managers. The shared ecological knowledge is rooted in participation in oral traditions that situate indigenous communities in place where practices like gathering *qémes* are conducted. The relationships built are sacred and include measures of etiquette such as the required degrees of respect and reciprocity inherent in indigenist theorists' conceptualization of IK.

Recommendations for integration include recognizing both the epistemic and political barriers within existing natural and cultural resource management structures to IK. Self-locating is a measure that can be used to acknowledge differing paradigms and bias. Workshops help to establish a learning-by-doing process, social networks, rapport, and trust to co-generate knowledge within an ACM approach. Through such a format, environmental managers and indigenous communities can initiate a holistic management approach that does not negatively impact the positivist or indigenist paradigms held by its participants. Social networks and the building of social capital among collaborators would help support such a co-generation strategy through mutual acknowledgement and respect for all

collaborators' paradigmatic positions. The discussions by Usher (2000), Kristofferson and Berkes (2005), and Parlee and Berkes (2006) exemplify some of the contexts in which indigenous communities can use local systems such as community sanctions to contribute to stewardship, conservation, and management.

Integration initiatives need to move beyond conventional scientific knowledge and IK integration to incorporating indigenous communities' "unique ecological, social, cultural, and spiritual understandings of the land into a broader societal environmental ethic" (Cobb, 2011, p. 10). Partnerships between IK and environmental managers need to be built to solve problems that occur at the nexus between social, political, and landscape issues. Collaboration can strengthen networks between community conserved areas and government agencies' environmental management. Adopting a knowledge co-generation approach informed by indigenist theory and ACM helps managers to engage in ecosystem-based management in which humans are participants, establish cross-cultural monitoring, and conduct ecological restoration that incorporates community perspectives and social needs.

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Chapter 2: Nimíipuu Contributions to Research Methodology: A Comparison with Indigenist, Qualitative, and Quantitative Approaches

1) Introduction

As indigenous communities continue to assert their authority in research with initiatives such as the protection of intellectual property rights and the requirement of research permits, researchers working with such populations have an increasing responsibility to support community representation. While community collaborative research approaches are expanding and increasing (Ervin, 2000; Herr & Anderson, 2005; Kemmis & McTaggart, 2003; Whyte et al., 1991; Williams & Brydon-Miller, 2004), many lack integration of research methods that are rooted in a community's ontological, epistemological, and axiological principles. Indigenist researchers argue research approaches need to expand beyond conventional participatory efforts to adopting methods supported by and situated in community members' metaphysical frameworks (Braithwaite, 1997; Cochran, 2008; Denzin, Lincoln & Tuhiwai-Smith, 2008; Ermine, 1999; Kovach, 2009; Steinhauer, 2002; Tuhiwai-Smith, 2001; Wilson, 2008). This chapter explores differences across research approaches and describes an indigenist informed ethnographic approach to understanding Nimíipuu ontological, epistemic, and axiological principles within a research context.

The chapter is based on combined components of both qualitative ethnographic and indigenist approaches for exploring Nimíipuu knowledge, practices, and views toward environmental management. The Nimíipuu, also known as the Nez Perce, have a population of approximately 3,500. Nimíipuu ancestral homelands expand into what are now parts of Washington, Oregon, and Idaho. The Nez Perce Tribe's reservation, designated by the 1863 Treaty, is in Idaho with the seat of government in Lapwai (Nez Perce Tribe, 2003).

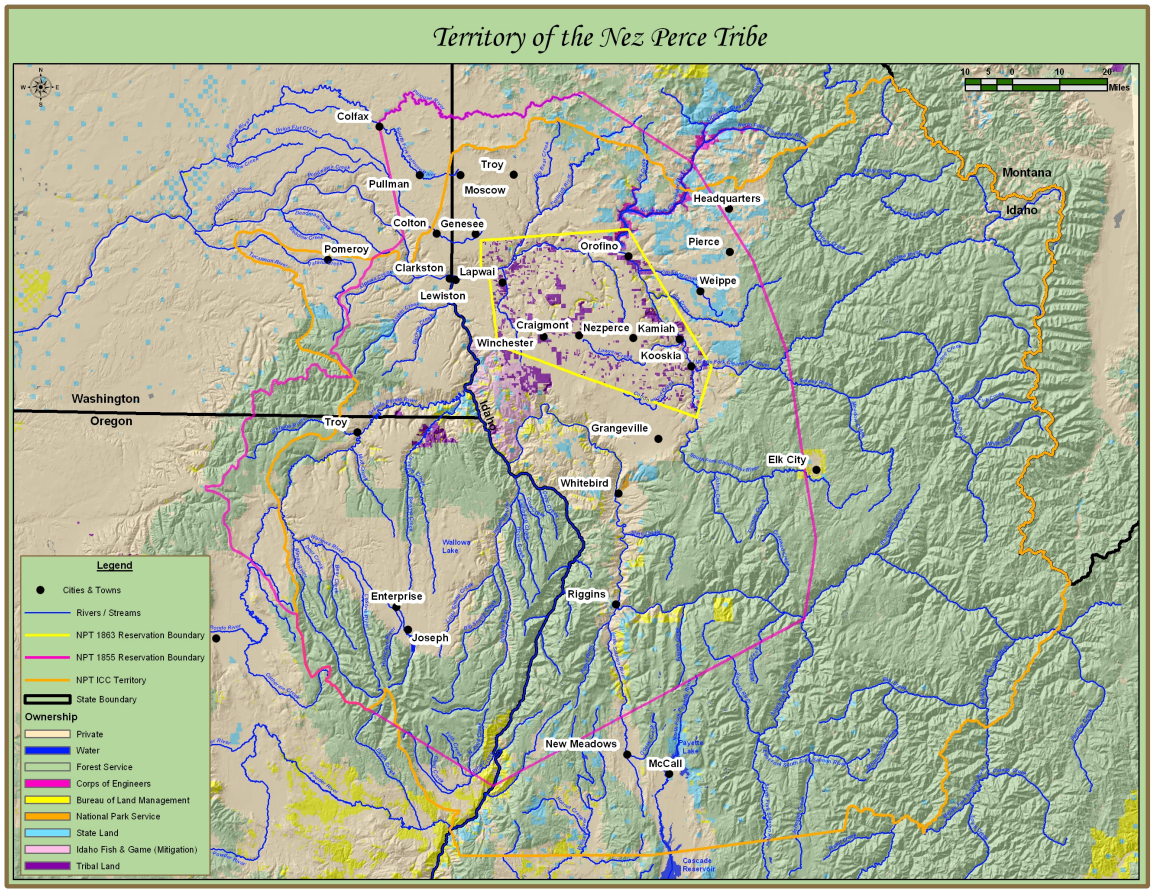

Figure. 1. Nez Perce Tribe territory boundaries. Source: Nez Perce Tribe (2009).

The 1855 Treaty between the Nez Perce Tribe and the US Federal Government reserved hunting, gathering, fishing, and pasturing rights at "usual and accustomed places" within the states of Idaho, Oregon, Washington, Montana, and Wyoming that are continually exercised (Nez Perce Tribe, 2003). In accordance with Federal trust responsibilities, the Tribe engages in consultations with several national forests and state agencies concerning land management issues. The Nez Perce Tribe's environmental management includes a Fisheries Department that has administered one of the leading fish restoration programs in the Snake River Basin. The Nez Perce Tribe is also noted for their Wildlife Management Division that assisted gray wolf reintroduction in the state of Idaho by leading their management for the first five years (Nez Perce Tribe, 2003; Landeen & Pinkham, 1999). The following table (Table 1) lists the Tribe's environmental management departments and their associated divisions.

Table. 1. Nez Perce Tribe Environmental Management

Natural Resources Department	Fisheries Resources Management Department
Natural Resources Cultural Resources Environmental Restoration & Waste Management Forestry & Fire Management Division Land Services Water Resources Wildlife Management Division	Conservation Enforcement Division Harvest Division Production Division Research Division Resident Fish Division Watershed Division

Source: Nez Perce Tribe (2012)

2) Indigenist Informed Ethnography

Ethnography supports research attempts to gain an in-depth understanding of community knowledge, perspectives, and practices. Such a research approach enables participants to elaborate on their complex perspectives through an inductive process using interviews, narratives, and participant observation techniques (Atkinson & Hammersley, 1994; Bailey, 2007 Bernard, 2011; Creswell, 2009; Hammersley, 1992; Kottak, 1999; Pelto, 1970; Willis & Trondman, 2000). To address this research topic, an ethnographic approach facilitates thick description and contextualization of Nimíipuu participants' knowledge, practices, and views toward environmental management.

Combined with an indigenist framework, ethnographic research facilitates integration of indigenous knowledge principles and structures to inform the research's cosmological context, methodology, and axiology. When working with indigenous populations, researchers should engage in a research process that reflects the cultural worldview of the participants (Struthers, 2001). Research practices that integrate indigenist frameworks facilitate a restructuring of researcher-participant relationships to one of collaboration and equality among all participants. Under indigenist research the researcher's role is situated as a participant, emphasizing the importance of equality. This ameliorates the imbalances of social and political capital that can occur when one community's knowledge is de-contextualized by another person, researcher, or group. This is especially important when

one considers the degree to which research involving indigenous communities' knowledge is imbued with a context of ethical norms for its collection and dissemination. Indigenous communities increasingly require research and its design to contribute to their self-determination and liberation struggles, as it is defined and controlled by their communities (Kovach, 2009; Tuhiwai-Smith, 2001; Wilson, 2008). Here, an indigenist framework within research can function as a corrective toward research design and practices that overlook important insights and contributions regarding how indigenous people and communities conceptualize their relationships to the environment and interpret them.

Although non-indigenous researchers have not been embedded in indigenous community-based epistemologies, they can take an active role in the engagement of indigenous concepts throughout the research process. Deeming it "indigenist theory" rather than "indigenous theory" encourages non-indigenous inquirers to engage with the approach; "To me it then becomes the name of a philosophy that anyone can choose to use rather than claiming any sort of racial exclusivity" (S. Wilson, personal communication, September 18, 2012). As such, adopting an indigenist framework as a non-indigenous inquirer helps to reconstruct the inquiry whereby the control is shifted from the researcher to the community (Denzin et al., 2008; Kovach, 2009; Tuhiwai-Smith, 2001; Wilson, 2008).

In an effort to integrate an indigenist framework as a non-indigenous researcher a collaborative relationship was initiated with the Nez Perce Tribe in 2009.[i] This project explored the Nez Perce Tribe's role in gray wolf reintroduction in Idaho and Nimíipuu perspectives toward wolves and their management. Exploring the relationships between the Nimíipuu and wolves assisted in laying the groundwork for further conceptualizations of Nimíipuu relationships with the broader landscape.

The research this chapter is based on began in 2011 upon informal meetings with tribal members in an effort to co-generate a research project. The resultant research topic explores Nimíipuu knowledge as it relates to community relationships with the landscape and how these relationships inform and have the potential to be integrated into both tribal-led and external agencies' environmental management regimes and practices. Such a research topic would entail understanding Nimíipuu perspectives of the environment as ontological, epistemological, and axiological principles expressed during the research process. Although a community's specific conceptions and perceptions may not fully be known or understood by researchers because they

are not a member of that community themselves, researchers can articulate components of community cosmology as they are expressed through the research process. Such was the case in working with Nimíipuu people.

As a researcher, my paradigmatic assumptions included a mixture of pragmatic and artefactual constructivist views. This research was influenced by a pragmatism based on premises that we come to know through doing and that thought functions to solve problems and promote action (Boog, 2003; Brydon-Miller et al., 2003). Artefactual constructivist arguments were also influential on the researcher including the premise that humans interact with the landscapes that they are embedded in through both material and immaterial reciprocal processes. As such, perspectives and relationships with the world arise from this dialectical exchange (Joubert & Davidson, 2010). These assumptions motivated interests in environmental management issues as they relate to Nimíipuu knowledge and impact treaty rights activities. Indigenist literature spanning from topics involving indigenous cosmological principles, critiques of quantitative and qualitative research approaches, and exemplifications of community-specific indigenist research techniques was used as a general tool to assist in the development of a Nimíipuu specific research methodology. Such influences fueled an interest in co-generating the research topic and having a collaborative process; both support Nimíipuu participants' constructing of the research in an effort to address real environmental management challenges and barriers.

For this project, the research design was initially grounded in qualitative ethnographic and indigenist approaches. The inclusion of Nimíipuu knowledge and inquiry approaches was developed through an iterative research process. Such a design primarily consisted of open-conversational interviews and the gathering of oral traditions and other forms of stories. Research involved interviewing 14 Nimíipuu tribal members. Interviews ranged from one to four hours in length and were often held over food and in public spaces or personal offices. In order to establish relational accountability with the participants, interviews often involved several meetings and encounters with participants. Data saturation, the point at which research themes are apparent, repeated by several participants, and little new information arises during interviews (Bernard, 2011), occurred around the 10th interview of the research process.

Participation and observation in Nimíipuu and Forest Service events, activities and land management processes also generated knowledge on the research topic. Beginning in 2011,

participation and observation was exercised in various events such as powwows, cultural conventions such as basket weaving, fishing events and activities, and presentations. In addition, the research process was informed by four consultations with the Circle of Elders, a Nimíipuu group formed of female and male elders. These meetings contributed to the gathering and interpreting of Nimíipuu knowledge.

Open conversational interviews, gathering narratives, and participation and observation techniques all contributed to developing relationships with the Nimíipuu community and landscape. Events participated in and observed were documented through note taking and reflective journal pieces and interviews were audio recorded. Throughout the research process interviews were transcribed, coded, and triangulated with the knowledge generated by other method techniques such as participation in a fishing event. A Nez Perce tribal member assisted in the transcribing of interviews for those participants who did not want anonymity. Primary sources generated during the research process and secondary sources generated externally from this research were both used. The resultant themes were collaboratively interpreted by consulting indigenist literature, Nimíipuu principles, primary and secondary sources involving Nez Perce Tribe participation, and through direct consultation with elders and participants.

Another major source used for both guidance and interpretation of the research findings was the Nimíipuu concept of *tamálwit.* This concept was first introduced to me in 2009 during research with the Nez Perce Tribe on Idaho wolf reintroduction; it was used to discuss the important role of wolves as teachers of *tamálwit*. The concept appeared again in 2013, as several participants discussed the concept's power for guidance. The Nez Perce dictionary states, *tamálwit* is a, "law, ordinance, commandment, constitution, government" (Aoki, 1994, p. 679). *Tamálwit* as described by a participant below, expresses a concept that expands beyond a law and speaks to a way of being,

> Its [*tamálwit*] our, our, you might say law, Indian law, or in a real broad anthropological sense you might say its our culture or something, but its basically how… its like our laws, in a literal sense, in a ceremonial sense, its our law that we live by. All that makes us who we are… it can spread out to a whole lot of different things, in terms of again, how we relate to the land, and even really simple, basic things of knowing particular types of medicines, knowing particular types, or places to go for medicines, the right times of year, all the things that go into maintaining that connection to, to the land. Fishing, hunting, the proper times, all that is not something that we make, and that's why, part of the reason we aren't in tune with, like, making hunting seasons, or fishing

> seasons, and stuff, is because sometimes our view of the proper time to hunt fish is different than, like say the State's version, or even another tribe's version. So that all guides, its supposed to, those laws are supposed to guide us on this land, and they're pretty dynamic, some people may have, some families may have more knowledge concerning one particular aspect, you know, but collectively, that's what makes up being Nez Perce, is that understanding. And then it goes to like, you know, just basic stuff, laws that we have as far as families and how we relate to one another, and how we draw kinship to one another, and things like that, so it just covers everything, basically (Nez Perce tribal member A, 2013).

As this Nez Perce tribal member explains *tamálwit* is a philosophy, a set of principles that guide interactions with the world. Its ontological principles tell of the nature of the world and how it works such as knowledge associated with plant medicines and when to hunt fish. *Tamálwit*'s epistemological principles tell of how beings *come to know* the world, through such practices as fishing, gathering medicines, ceremonies, and through teachings from other beings. Its axiological principles tell of the ethical context for interacting with the world, such as the appropriate ways to interact with family and the landscape. Collectively, *tamálwit* speaks to what "makes up being Nez Perce."

Developing an understanding of *tamálwit*, as it is conceptualized, shared, and embedded in relationships has been a major component of the research process. Understanding such a philosophy would present its challenges, but to not integrate such an important aspect of Nimíipuu lives into both the process and content of this research project would be a disservice to the Nimíipuu community, their knowledge, forms of governance, and ways of being. An understanding of *tamálwit* principles occurs through one's relationships within the Nimíipuu community and to the landscape. Throughout the research process I strived to build these relationships and to be attentive, participate, and observe, so that I may be able to integrate such principles into the research process. To address research with *tamálwit* principles in mind is to integrate measures of equality, collaboration, respect, and reciprocity. Such measures take shape in the re-telling of Nimíipuu perspectives and interactions with the world as they conceptualize and interpret them.

Another aspect in which principles of *tamálwit* take shape within the research process is through application of the research for the betterment of the participating community; a tenet of indigenist research as well (Denzin et al., 2008; Kovach, 2009; Weber-Pillwax, 2001; Wilson, 2008). Increasing pressures on the environment continue to underline the importance of

human-environment interactions and the relevance of social dimensions of environmental management (Ingold, 2000; Kosek, 2006; Knight, 2000; Lindquist, 2000). This research project gathering Nimíipuu knowledge as it relates to community relationships with the landscape and its presence and potential integration into environmental management can greatly inform both tribal and external land managers' practices.

Given the current climate, research outputs must progress beyond academic institutions to application within the broader society (Ervin, 2000; Herr & Anderson, 2005; Kemmis & McTaggart, 2003; Kottak, 2006; Whyte et al., 1991; Williams & Brydon-Miller, 2004). To assist in facilitating such a goal, at the beginning of this research process in 2011 I received a career opportunity working with an Idaho national forest in cultural resource management and assisting consultations with the Nez Perce Tribe. Such an opportunity facilitates integration of Nimíipuu knowledge into land management through my position as it informs my understanding of Nez Perce landscape perspectives, treaty rights activities, and Nez Perce Tribe-National Forest land managers' relations. In addition to direct integration, research outputs include Tribal ownership of data, presentation of data to the Tribe's environmental management programs, and presentations to external agencies' land managers.

3) Comparative Tables

Indigenist research approaches are defined by their comparative and contrastive attributes to quantitative and qualitative research approaches. The following tables and discussions (Table 2 - Table 16) explain the indigenist informed ethnographic approach utilized in this project and outlines its diversions, overlap, and uniqueness from the described quantitative and qualitative research approaches. The tables and discussions describe tenets of indigenist research as they are outlined by contemporary literature. Also illustrated are some Nimíipuu epistemic, ontological, and axiological concepts and principles as expressed by the Nimíipuu community through both primary and secondary sources. Together, qualitative approaches, indigenist literature, and Nimíipuu community-specific principles assisted in guiding the indigenist informed ethnographic approach utilized.

a) Paradigmatic Implications

The contrastive differences between a post-positivist paradigm, artefactual constructivist, and indigenist paradigms have influenced indigenist researchers' critique of western science and its own development. Table 2 describes paradigms that often are, or can be, adopted by the described research or inquiry approaches. In the following discussion the term research refers to the act of seeking information as universities and other similar organizations institutionalize that act. Inquiry refers to the act of seeking information, which can be done outside of academic institutions. The ontological differences, regarding what constitutes reality, that follow from these paradigms affect research and inquiry at every level and mark some of the major differences between the approaches.

From an ontological standpoint, post-positivist inquirers argue an objective reality exists independent of human influence. This post-positivist ontological principle emphasizes a demand for high researcher control, minimization of subjectivity, and achievement of representativeness (Creswell, 2009; Gioia, & Pitre, 1990; Gupta & Ferguson, 1997). In contrast to a post-positivist ontological view, artefactual constructivist inquirers argue there is interplay between a material reality and a human constructed reality, by which humans both construct and are constructed by reality (Curry, 2003; Joubert & Davidson, 2010). As indigenist paradigms articulate, principles of indigenous knowledge support an ontological understanding of reality as a series of relationships between all features on earth that are co-dependent. Furthermore, it is through a diachronic, subjective, and growing relationship with reality that people *come to know* what reality is (Cajete, 1999; Kovach, 2009; Personal communication with Nez Perce tribal members, 2008-2009, 2011-2013; Wilson, 2008).

Quantitative, qualitative, and indigenist inquiries account for researcher subjectivity in different ways. A post-positivist researcher's attempt to achieve an objectivist researcher perspective enables generalizability to a larger population, so it is strived for (Gioia, & Pitre, 1990; Guba & Lincoln, 2005). The artefactual constructivist and indigenist approaches to inquiry argue that it is through humans' subjectivity that we come to understand or *come to know* reality, making researcher subjectivity a necessary part of the research process (Gioia, & Pitre, 1990; Guba & Lincoln, 2005).

Nimíipuu principles relating to inquiry or a *coming to know* process describe reality as consisting of a series of subjective relationships and ethical teachings, for those

relationships are embedded in the concept of *tamálwit*. Objectivity toward nature inhibits gaining knowledge through oral traditions and *tamálwit* because these devices rely upon and teach an ethical responsibility rooted in the understanding of one's subjective relationship with the landscape. Take for example the following excerpt from an interview,

> "the animal people were called to council and they said a great change is coming. They all agreed that they are going to give themselves. I'll give my hide/skin for clothing, my meat for the people to come. The fish they all agreed that they were going to give themselves to us in exchange that we take care of them. They have that agreement…they promise to give themselves for us and then we would take care of them. On the land, on this precious land that we are talking about we take care of the things that will take care of us" (As told by Nez Perce tribal member, Angel Sobotta, 2013).[ii]

This Nimíipuu oral tradition about a great gathering during which animals and many others sacrificed parts of themselves for the Nimíipuu teaches a responsibility for reciprocity to the landscape. It reminds them of the sacrifice animals, like salmon, make for the Nimíipuu. As one tribal member expressed, such oral tradition teachings influence the Fisheries Department's objectives to support salmon restoration as such an act reciprocates what salmon sacrifice to the Nimíipuu people (Nez Perce tribal member, Aaron Penney, 2013). The Nimíipuu axiological principle of *téḱe*, a concept for the giving of food and sharing (Aoki, 1994) also expresses this reciprocal exchange.

Téḱe is expressed in many of the daily actions of Nimíipuu people. The following quote provides an example of such considerations. This participant working on steelhead research discussed the amount of waste that occurs when collecting data; often only a small amount of tissue is required. "With my work I try to use every little thing, like whenever I sacrifice a fish for tissues for energetics. I take everything I could off that fish for analysis" (Nez Perce tribal member D, 2013). The participant contextualized his actions by describing that the steelhead had given his life for his research and in exchange he uses all the data-potential tissue that he could; such an action illustrates how Nimíipuu-land *relationality* informs the ethics of steelhead energetics research.

In addition to paradigmatic differences between an objectivist and subjectivist view of reality, quantitative, qualitative, and indigenist approaches support different understandings of empiricism. Quantitative inquiry supports a view of empiricism rooted in

the inquirers' objective relationship to the inquired that does not take into account subjective experiences and interpretations. For example, diachronic fishing experiences at a watershed may yield valuable information to an objectivist researcher, but the use of dreams or oral traditions that further inform those experiences would not be considered valid sources of knowledge. Both qualitative, through an artefactual constructivist approach, and indigenist approaches specifically acknowledge the human constructed or relational factors that influence and inform one's experiences that augment observations gained from long-term fishing at the same watershed. Qualitative approaches acknowledge such human constructed influences on perceptions, experiences, or observations of reality when applied to the communities they work with and documenting researcher self-reflectivity.

Table 2: Paradigm Characteristics of Frameworks for Accumulating Knowledge

Characteristic	Frameworks for Accumulating Knowledge			
	Quantitative Approach	**Qualitative Approach**	**Indigenist Approach**	**Nimíipuu Approach**
Paradigm	***Post-positivist:*** A objective reality exists separate from human perceptions **Principles:** Objectivism: Researcher needs to obtain as close of an objective detachment as possible to discover reality Realism: Reality is assumed to exist, but cannot be fully known because of flawed human intellectual mechanisms Reductionism: Reduces ideas to small, discernable parts to test Determinism: Causes determine effects Empiricism: The truth about reality is learned through experience and observation[iii]	***Aretfactual Constructivist:*** Reality is both material and constructed (i.e. humans are constituted by and constitute reality)[iv] **Principles:** Subjectivity: Researcher and the research is interactively linked with the values of the researcher inevitably influencing the research[v] Co-dependency: that which doing the perceiving and that which is perceived are interdependent[vi] Approaches tend to ask how experiences with the material environment influence the construction of knowledge and values	***Indigenist:*** Reality is one's inherent relationship with nature (nature contains dynamic active entities inseparable from our own perceptions) **Principles:** Natural Democracy: All things are alive, intelligent, have a right to exist, and require respect and measures of reciprocity Everything is Related: All things are related and are part of a cycle Natural History of Relationships: Humans have a history in place(s) and a history of relationships with other beings Native Science Orients Itself to a Specific Space and Place: Knowledge is used to understand, explain, and honor the life in spaces and places that are inherently sacred Everything Has a Time and Evolutionary Path: A natural evolution is expressed through cycles in which everything has a role and is connected [vii]	***Tamálwit:*** A Nimíipuu concept for epistemological and ontological principles that guide decisions and actions[viii] **Principles:** Epistemological Principle: Nimíipuu people come to know reality through their diachronic relationships with the land Teachings are also embedded in oral traditions, stories, ceremonies, practices, places, and in the being of all things Ex. Wolves teaching about hunting and family dynamics Ontological principles: Nimíipuu are a part of the land not separated from it The land is full of gifts and teachers that provide All beings have an inherent value and moral rights aside from what humans attribute

b) Discipline

Although disciplinary lines are being blurred in academic institutions with multidisciplinary, interdisciplinary, and transdisciplinary research, quantitative and qualitative approaches are commonly associated with specific disciplines. Table 3 describes the disciplines and communities, which support and validate these approaches. A quantitative approach is often adopted under biophysical, applied, and behavioral sciences and can include biology, chemistry, psychology, and sociology disciplines. The social and human sciences support a qualitative approach within disciplines such as anthropology, sociology, nursing, social work, counseling, and education.

Indigenist research approaches are community rooted rather than having foundations in academic disciplines. Such an approach stems from the indigenist premise that many non-indigenist approaches support processes of colonization by delegitimizing the participating communities' knowledge and neglecting to assist empowerment and reciprocity to participating indigenous communities (Deloria, 1997; Denzin et al., 2008; Four Arrows, 2008; Kovach, 2009; Tuhiwai-Smith, 2001; Wilson, 2008). Distinctively, indigenist approaches support deriving epistemic, ontological, and axiological principles that inform the research process from indigenous communities (Cordero, 1995; Ermine, 1999; Kovach, 2009; Struthers, 2001; Weber-Pillwax, 2001). Indigenist approaches as institutionalized in the academy are strongly represented in the disciplines of education and healthcare and are often applied to help address community struggles (Steinhauer, 2002; Wilson, 2008). Indigenist approaches share similarities with participatory, action, and collaborative research as they attempt to address advocacy and problem solving.

Table 3: Discipline Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
DISCIPLINE	**Associated with:** Biophysical sciences (e.g. biology and chemistry) Applied and behavioral sciences (e.g. psychology, archaeology, some approaches to anthropology, and sociology)	**Associated with:** Social sciences (e.g. anthropology and sociology) Human sciences (e.g. nursing, social work, counseling, and education)	**Associated with:** Indigenous communities Being utilized in education and healthcare Has similarities with participatory, action, and collaborative research	**Associated with:** Nimíipuu Community Has implications for all types of research interests Participatory, action, and collaborative research can help support a Nimíipuu approach

c) Inquiry Strategies

As Cajete (1999b) explains, humans have a natural drive to learn through direct experience. Table 4 describes the inquiry strategies supported by quantitative, qualitative, indigenist, and Nimíipuu approaches. Quantitative approaches to research involve a moderate to high degree of researcher control. Examples include experimental, quasi-experimental, and correlational designs that require artificial or modified natural settings. Qualitative research approaches can include ethnography, phenomenology, and narrative designs. The researcher control under such designs is often less pronounced when compared with quantitative approaches as participants play a larger role in selection of participants, the setting, and the depth of data collected.

As indigenist approaches are rooted in the participating community's cosmological principles, the degree of researcher control is low. Research is much like human's natural processes of inquiring. Cajete (1999b) explains that indigenist research involves active and creative participation, art, practices, oral traditions, dreams, visions, and ceremonies. Implications for research entail involvement in, and the recording, of indigenist *coming to know* strategies. Similarly, Nimíipuu people *come to know* the landscape by developing a relationship built upon elders, *tamálwit*, oral traditions, ceremonies, place, animals and plants, and practices such as gathering or fishing among other customs. As such, implications for research strategies would entail building relationships with the Nimíipuu

community and landscape through the participation and gathering of knowledge by means of community-supported sources.

Table 4: Inquiry Strategy Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
INQUIRY STRATEGIES	**Scientific research strategies** **Strategy examples:** Experimental design Quasi-Experimental design Correlational design	**Scientific research strategies** **Strategy examples:** Ethnography Phenomenology Narrative	***Coming to know* inquiry strategy**: Humans' natural drive to learn especially through direct experience **Strategy examples:** Art Practices Oral traditions Dreams, Visions and Ceremonies[ix] **Research implications:** Researcher involvement in and the recording of indigenist *coming to know* strategies	***Nimíipuu* approach to inquiry:** Learning is reliant upon community relationships and those with the land **Learning avenues:** Elders *Tamálwit* Oral traditions Practices Place Animals and plants Dreams, visions, and ceremonies **Research implications:** Researcher building relationships with the community and landscape through participation The gathering of knowledge from community validated sources of knowledge

d) Theoretical Frameworks

Theory itself plays a necessary role in all the described approaches, but how the inquirers or researchers use theory differs; Table 5 illustrates these differences. Quantitative research designs often use theory in a deductive manner to drive the research and test cause and effect. However, the exception of the disclosure of correlation through statistical analysis does help to form inductive claims of probability. Qualitative research designs support utilizing theory as a lens to enable the inquiry to focus on a certain level of analysis.

The research's induction enables explanation of the phenomena as it is observed throughout the research process and from which a theory is born, an existing theory, or a combination of new and existing theory are used to explain the phenomena.

Within an indigenist approach, the community's cosmology serves to guide research as theory does for the quantitative and qualitative approaches. As such, indigenist approaches to research through an iterative process embeds methodology or a *coming to know* within a cosmological context to provide meaning and guidance throughout the research process (Cajete, 1999; Kovach, 2009; Wilson, 2008). Theoretical guidance may include indigenist literature, indigenous cosmology, indigenous expressions and teaching devices such as oral traditions, and participation in the community.

Within the Nimíipuu research context, participants suggested avoiding academic lenses and reliance on academic literature as the knowledge I sought was in the minds of the participants. *Tamálwit*, as a Nimíipuu concept, offers epistemic, ontological, axiological, and methodological guidance. Epistemic and ontological claims from participants assisted in informing research processes such as gathering knowledge through a developing relationship with the Nimíipuu community and landscape based on engagement and participation. As I learned, the Nimíipuu people come to understand reality through their subjective relationships. Likewise, I came to learn about Nimíipuu knowledge of and relationships with the landscape and land managers through my subjective relationship with the Nimíipuu people, landscape, and land managers. The Nimíipuu concept of *téḱe* informed my methodological approach to sharing and giving food during interviews and participatory events and integration of applied research outputs.

Table 5: Theoretical Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
THEORETICAL FRAMEWORK	***Deduction:*** Takes general information from theoretical sources and tries to draw conclusions Theory is often used at the beginning of research to drive the study in a specific direction Focused on testing, verifying, and building theory Guidance comes from theorists in the academic community	***Induction:*** Takes specific information from research to create or build on an existing theory Theory is often referenced throughout the research process like a lens that shapes the development of research questions, methods, and interpretation Guidance comes from theorists in the academic community	***Indigenist:*** Indigenist community's cosmology, elders, practices, and the landscape guides *coming to know* **Research implications:** • Indigenist literature • Participating community's cosmology and principles • Coyote stories and oral traditions[x] • Participation Guidance comes from elders who are the keepers of the community's knowledge	***Tamálwit:*** A concept for a set of principles that guide interactions with the world **Research implications:** • Nez Perce cosmology, concepts, and principles Ex. *Tamálwit* • Oral traditions • Building relationships with the community • Participation in community events and practices

e) Vocabulary Associated with the Measured Units

Table 6 shows the vocabulary used by the different approaches. Common vocabulary used under quantitative research approaches includes constructs, that is ideas or notions, and propositions, statements about the ideas or notions. Independent and dependent variables are measurable characteristics that are quantifiable and operationalized to show the direction of the cause-effect relationship. For qualitative research, constructs and propositions are also common vocabulary. Principles, relationships, and narratives expressed by a community or group are also common vocabulary and interests of qualitative researchers. For indigenist research, vocabulary is often contextualized and not represented in an abstracted form and often includes the terms relationships, teachings, and oral traditions. Relationship was a common construct among Nimíipuu participants as it was used to express a relationship with the landscape, outside communities, and external agencies.

Table 6: Vocabulary Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
VOCABULARY ASSOCIATED WITH THE MEASURED UNITS	**Utilized vocabulary:** Constructs, propositions, independent variable(s), dependent variable(s), hypothesis, and operationalization[xi]	**Utilized vocabulary:** Constructs, propositions, principles, themes, patterns, relationships, and narratives[xii]	**Utilized vocabulary:** Relationships, teachings, oral traditions, practices The context in which things are articulated are of extreme importance[xiii]	**Utilized vocabulary:** Relationships with the land, others [outside communities], and the government [State or Federal governing entities] The context of statements are key for understanding *relationality*

f) Conception of Relationships

The importance of specific types of relationships is emphasized under the different approaches; Table 7 illustrates these differences. Quantitative research approaches focus on cause and effect relationships that are generalizable to a broader community (Bernard, 2011; Creswell, 2009). A quantitative study might involve understanding the influence wolf reintroduction has on people's hunting behaviors. Contrastive relationships involving different groups and or ideas often tend to be a focus of qualitative research approaches (Bailey, 2007; Bernard, 2011; Creswell, 2009). Anthropology, in particular, as a discipline often explores cross-cultural comparisons of contrastive relationships. Such research might include exploring Nimíipuu people and Anglo livestock producers' perspectives of and relationships with wolves. Indigenist research approaches describe relationships as expressions of a *relationality* principle in which all is connected through a reality of *equal* relationships with all beings (Cajete, 1999b; Wilson, 2008). Nimíipuu participants explain this conceptualization of relationships through expressions such as, "the earth is my body," "this land is my body," and "we are relatives" (Landeen & Pinkham, 1999; Nez Perce Tribe, 2003; Personal communication with Nez Perce tribal members, 2009-2013). Similes such as, "we are like salmon" and "we are like wolves," were often used during interviews to express this relationship of closeness and connection with the environment.

Table 7: Conceptual Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
CONCEPTION OF RELATIONSHIPS	***Cause-effect relationships***: These relationships are generalizable[xiv]	***Contrastive relationships:*** These relationships involve different groups or ideas[xv]	***All My Relations:*** All things are of equal relation and are connected[xvi]	***Relationality:*** Guidance comes from relationships with all beings **Expressions of *relationality*:** The earth is my body This land is my body We are relatives We are like salmon We are like wolves

g) Sampling and Selection Strategies

Differences on how to solicit participation in research are described below in Table 8. Randomization of sampling and assignment in quantitative research enables a sample to be representative of a population (Campbell et al., 1963; Graziano & Raulin, 2012; Marsden & Wright, 2010). Qualitative inquiry often follows a selection process of chain referral, whereby participants suggest potential participants. Similarly, indigenist approaches rely on individuals in the community to select participants. Those selected often include elders, family members, individuals respected in the community, specialists, and individuals in the community considered knowledgeable on the subject. Indigenous community-shared values may influence the type of people participants refer that may differ with non-indigenous communities. For example, non-indigenous communities may not share the same degree of emphasis on interviewing elders as indigenous communities may. Such a selection strategy was utilized when collaborating with the Nimíipuu community. Most participants were referred, often related, and included elders and tribal government specialists in natural and cultural resource management. In addition, participants encouraged selecting participants from the community's general populace in an effort to include voices not often heard.

Table 8: Participant Inclusion Characteristics of Frameworks for Accumulating Knowledge

Characteristic	Frameworks for Accumulating Knowledge			
	Quantitative Approach	Qualitative Approach	Indigenist Approach	Nimíipuu Approach
Selection or Sampling Strategies	**Sampling:** Random sampling enabling generalizability of data[xvii] **Includes:** Random individuals with the given population	**Selection:** Selection techniques of chain referral[xviii] **Includes:** Experts, friends, those respected by the participants	**Selection:** Selection is determined by individuals in the community **Includes:** Elders, family members, and those respected in the community[xix]	**Selection:** Selection is determined by individuals in the community **Includes:** Elders, environmental management specialists, family members, and respected community members

h) Ways to Generate Knowledge

Data generation techniques are described in Table 9 for quantitative, qualitative, indigenist, and Nimíipuu approaches. Within quantitative research data collection is conducted through empirical observations under a high degree of control. Methods often include questionnaires, semi-structured and structured interviews, and observations. Qualitative methods involve a lower degree of researcher control and involve data gathering techniques under which there is a higher degree of participant influence. Such approaches include open-conversational, semi-structured, and structured interviews, narratives, and participant observation (Bailey, 2007; Bernard, 2011; Creswell, 2009). Both quantitative and qualitative approaches may utilize the same interview styles and regard observation as a useful method.

Indigenist approaches may involve similar methods to both quantitative and qualitative approaches; however, a key difference is that these methods are imbued with aspects of the community's cosmology to help guide these methods. For example, focus groups or group interviews may be utilized in all three approaches; an indigenist research alteration of this method would be a talking circle. Talking circles are a method in which participants form a circle and a feather is passed around the circle to indicate whose turn it is to speak. A participant states what is on their mind and is the sole person at that moment to speak. The feather is used as a symbol of respect that helps to ensure proper etiquette and is

passed in a clockwise direction, so that the next person is allowed to speak. This creates a safe environment where no one is interrupted or criticized and the researcher can act as a facilitator (Wolf & Rickard, 2003).

Open-conversational interviews, narratives, and participant observation (Atkinson & Hammersley, 1994; Bailey, 2007; Bernard, 2011; Schensul et al., 1999) were the main methods used to gather Nimíipuu knowledge. To ensure interviews were tailored to the research question, topical discussions were focused toward aspects concerning Nimíipuu knowledge, practices, and views toward environmental management. Open-conversational interviews provide space for Nimíipuu participants to articulate and develop their views because the inquiry is not limited to rigidly defined questions. Gathering narratives, recounts of events, descriptive similes, and symbolism contextualizes Nimiipuu knowledge as embedded in community pedagogical devices.

These techniques give respect to the participant's story by facilitating the participant's control over sharing knowledge (Kovach, 2012). In addition, open-conversational interviews supporting narratives, recounts of events, descriptive similes, and the use of symbolism enable Nimiipuu participants to utilize their own concepts and operationalize them within self-constructed propositions. This method facilitates the use of Nimíipuu principles of knowledge and structures; for example, it supports the role oral traditions play in the Nimíipuu community.

In addition to oral traditions, another pedagogical device is learning-by-doing. Native science, as described by indigenist literature is rooted in diachronic experience and knowledge is gained through participation (Cajete, 1999). Similarly, Nimíipuu educators express that Nimíipuu knowledge transmission is much more effective via participation. Nez Perce Tribe environmental managers highlight their diachronic knowledge of and experiences with the landscape established prior to historical baselines as useful for ecosystem restoration. As such, participation in and observation of Nimíipuu events and practices enable the researcher to learn through community-supported pedagogical devices. This facilitates developing a first-hand experience and understanding of how Nimíipuu knowledge takes shape within practices and is generated and shared. Selection for engagement in Nez Perce practices was based on open-invitations and participants' invitations.

Table 9: Data Generation Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
WAYS TO GENERATE KNOWLEDGE	***Data collection:*** Is through empirical observations with a high degree of researcher control **May involve:** Questionnaires Interviews: Ex. Semi-structured or structured Observation[xx]	***Data generation:*** Involves a lower degree of researcher control than quantitative with increasing participant control **May involve:** Narratives Interviews: Ex. Open-conversational, semi-structured, or structured Participant observation[xxi]	***Coming to know:*** Occurs through active and creative participation in community practices and with their cosmology[xxii] **May Involve:** Participation Interviews: Ex. Open-conversational, semi-structured, structured interviews, or talking circles Narratives[xxiii]	***Building relationships:*** Knowledge is gained through building relationships with people and the landscape **Involved:** Open-conversational interviews Gathering oral traditions and stories Participation Observation

i) Sources of Knowledge

As shown in Table 10 primary and secondary sources are used by all approaches. Indigenous communities often do not categorize sources under these terms. In addition, indigenist and Nimíipuu approaches highlight an expansive researcher ethical responsibility to sources. An expression of such responsibility is indigenist cosmologies often regard elders as the keepers of traditional knowledge (Cajete, 1999; Personal communication with Nez Perce tribal elders, 2011-2012) and out of respect for such elders indigenist research approaches encourage elder participation (Kovach, 2010; Personal communication with Nez Perce tribal members, 2011-2012; Wilson, 2008). As indigenous cosmologies often support equality among all beings, plants and animals are also sources of knowledge requiring further ethical responsibility. Dreams and visions are also sources of knowledge (Cajete, 1999; Kovach, 2010). Quantitative and qualitative approaches may view these sources as invalid due to a lack of measures for objectivity from the standpoint of quantitative research or transferability of these sources for qualitative research.

Table 10: Data Source Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
SOURCES OF KNOWLEDGE	**Primary and secondary**[xxiv] Primary: sources generated during the study Secondary: sources removed from the study Researcher responsibilities to the protection of human subjects	**Primary and secondary**[xxv] Primary: sources generated during the study Secondary: sources removed from the study Researcher responsibilities to the protection of human subjects	**Primary and secondary**[xxvi] **Indigenous communities:** Sources of knowledge may include people, plants, animals, places, dreams, practices, visions, intuition, and stories Sources require an expansion of the researcher's ethical responsibilities	**Primary and secondary** **Nimíipuu community:** Sources of knowledge include places and features in the landscape, elders, and practices Sources require an expansion of the researcher's ethical responsibilities

j) Measurement

Table 11 shows the measurement of data is often different among quantitative and qualitative approaches and meaning rather than measurement is a focus for indigenist and Nimíipuu approaches. Quantitative data is numeric; qualitative data can include text, discourse, images, audio, narratives, and numeric (Bernard, 2011; Creswell, 2009). Qualitative measurement includes being aware of and documenting the text, what is actually said, the context, the environment things are said in, and the texture, how things are said (Dundes, 1980).

With indigenist approaches there is an emphasis on meaning rather than measurement. Meaning is attributed to a parts' relationship to the whole. As a participant retells an oral tradition, the stated narrative itself is important, but perhaps more important is how the oral tradition is related to *tamálwit.* Take for example the following oral tradition:

> there was this young couple that had a child and they were told to not separate the string from the cradleboard. I mean you are familiar with a cradleboard and what they look like…and now they have laces up the front. Well, this young mother kind of, she in her haste for want of soothing the child and being up all night and just being worn down she in her haste she separated the string from the cradleboard and that baby, was just there on her lap, it jumped up on to all fours and turned into a little deer, it sprouted this snout, big ears, and black hooves. It jumped to the door and shot out the door. She ran to the door and they watched as that

> deer took flight and from that day on the deer flew. They no longer were bounding around in the forest and the people suffered. They became sick and they would always wish that the deer would come back down when they would see them fly overhead. Until these 5 brothers came and they said we are here to bring the deer back to you, but let us implement our plan. And not having a better option the people told those 5 wolf brothers, go ahead and do that. So, each wolf brother went to a different ridgeline and these deer would come over head and one of them got tired and decided that it was going to lie on the ground and rest for a little bit and so all of the deer flew off like that and that one rested or chose to rest on a particular ridgeline and this wolf came out and barred its teeth and snarled at it and growled and really made itself fierce. Scared that deer into flying to another ridgeline where upon another wolf brother came out and did the same thing, you know, made itself fierce. And they kept doing that, each of those wolf brothers kept scaring that deer until eventually that deer landed in front of the youngest wolf brother and it told that wolf brother, 'okay I am going to give my body to you now but allow my people to retain the ability to jump as a symbol of the days when we took flight to the skies,' so the wolf brother said, 'okay I'll take you back to the people now.' Any they commenced to eat that deer…that's why the deer jump like that (Nez Perce tribal member B, 2013)

Within this story there are several key principles being illustrated as they are embedded within a Nimíipuu and place-based context. *Téḱe*, is exemplified in the giving of food from the deer to the people. Reciprocal exchange is also exemplified, as the deer agreed to provide itself as food to the people, the deer retained its ability to jump.

In addition to *téḱe*, another principle of *tamálwit* represented in the story is the importance of a part's role within the whole; each participant in the story serves a role that contributes to the whole that is the perpetuation of creation. These roles further contribute to the perpetuation of creation as this oral tradition and its knowledge was transmitted from this Nimíipuu participant to the researcher, myself, and as I to the reader. In this way, this oral tradition serves to welcome not only the researcher, but also the audience into a participatory experience as the re-telling of the story helps to perpetuate the world as its teachings are transmitted outward. As such, measurement is not an objective unit in the context of Nimíipuu knowledge and relationships to the landscape, as the researcher and the audience become participants in the perpetuation of Nimíipuu oral traditions. The participatory experience of the oral tradition's re-telling situates the participant, researcher, and audience equally, as all parts contribute to the whole.

Table 11: Measurement Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
MEASUREMENT	**Measuring unit:** Data is numerically counted or expressed[xxvii] **Examples:** • Exact count: 34 *Nimíipuu* went salmon fishing • Type of measurement: 34 pounds of salmon were harvested in the month of June	**Measuring units:** Text, discourse, images, audio, narrative, and numeric[xxviii] **Awareness of:** Researcher documentation of text, context, and texture *Text:* what is said Context: environment things are said in Texture: how things are said[xxix]	**Meaning:** Emphasis is on meaning rather than measurement **Awareness of:** Meaning is attributed to a parts' relationship to the 'whole;' as such relationships between ideas and objects and their community and place-based contexts are key Meaning is known through understanding and participating in indigenous cosmology and practices[xxx]	**Measurement contextualized:** Measurement is not an objective unit but rather a contextualized unit **Human-land codependency:** Ex. Connection with the land and landscape balance play a large role in measuring the health of one's self, family, community, ecosystem, and earth.

k) Structure of Data

Table 12 describes the ways structuring data differs across the approaches. Quantitative approaches structure data using existent theoretical and methodological structures. Interpretation of data relies on statistical analysis and content analysis; theoretical explanations may also be used to strengthen generalizations to a larger population (Creswell, 2009; Graziano & Raulin, 2012). Qualitative and indigenist analyses can involve textual, narrative, and observational analysis whereby themes emerging from interviews and narratives with participants are accompanied by participant observation and experiential learning. Such analyses were utilized under research with the Nimíipuu community. Textual analysis involves documenting the text, context, and texture of interviews, narratives, and participant observation events. Narrative analysis assists in interpreting how participants tell stories, narratives, or recount events (Bailey, 2007; Bernard, 2011; Hammersley, 1992;

Willis & Trondman, 2000). Events could include things such as a hunting event or a watershed management event from which themes and reoccurring structures may emerge. Observational analysis pertains to interpreting activities and events (Bailey, 2007; Bernard, 2011) in the field that may include hunting, gathering, fishing practices, powwows, and perhaps traveling to significant places where activities and stories have taken place.

Table 12: Data Structure Characteristics of Frameworks for Accumulating Knowledge

Characteristic	Frameworks for Accumulating Knowledge			
	Quantitative Approach	Qualitative Approach	Indigenist Approach	Nimíipuu Approach
Ways to add structure to the data	**Existing structures:** Utilize existing theoretical and methodological structures Content analysis and statistical analysis[xxxi]	**Themes:** Textual, narrative, and observational analysis Develop codes for themes Focus on the relationships between people or ideas[xxxii]	**Indigenous community devices:** May borrow from qualitative approaches for analysis Represent knowledge through narratives, storytelling, metaphors, and symbolism so that the meaning is contextualized and relational[xxxiii]	**Nimíipuu devices:** Supported textual, narrative, and observational analysis Knowledge is situated in a relational context and not abstracted from it Embedded in oral traditions, anecdotes, coyote stories, similes, symbols, and practice

Analysis often includes developing codes for themes that emerge within the data. Close attention is often paid to the relationships occurring between people or ideas as they are represented in the data generated. Themes emerge from events such as interviews and observed practices and may be triangulated by multiple participants and or observations. Themes were coded from transcribed interviews with Nimíipuu participants and triangulated across participants, with participation in and observation of events, and secondary sources including other research and projects involving the Nez Perce Tribe. Themes were categorized under the following topologies: epistemological, ontological, axiological, Nez Perce community organization and characteristics, oral traditions, Nimíipuu-land relationship, perspectives of land management, tribal management, federal and state

management, tribal-agency relationship building strategy, and tribal-non-tribal relations themes.

l) Interpretation

Quantitative researchers interpret results from statistical tests of hypotheses from which conclusions are drawn. Interpretation of such tests address the statistical significance of the results, how the results answer the research question, whether the hypothesis is supported by the results, and how theoretical claims and models can further explain the results or how the results might contribute further to theoretical claims or models. Qualitative interpretation of the data generated involves an iterative process of reflection on the data, exploring analytical questions, and documentation of thoughts. Themes that emerged from the data, coded or not, are interpreted with the assistance of participants' perspectives on meaning, existing theoretical frameworks and models, re-storying participants' narratives using structural devices, and development of new theory or new contributions to existing theory based on the data generated.

Under indigenist approaches, including research with the Nimíipuu community, community paradigmatic principles, community cosmology, secondary sources pertaining to the community, and indigenist literature are used to help interpret data (Kovach, 2009; Wilson, 2008). Indigenist literature was utilized to help support and articulate interpretation of themes from research with the Nimíipuu community. Interpretations can also be collaboratively drawn among participants in indigenist approaches. Under open-conversational interviews, follow-up questions pertaining to interpretation of key statements were asked to Nimíipuu participants. For indigenist research approaches, elders within the participating community are considered the 'theorists' that guide inquiry and its interpretation. Similarly, quantitative and qualitative approaches view 'elders' within the academic community as the theorists that guide and inform the interpretation of the inquiry. In support of elder interpretation, several consultations over research questions and themes were done with the Circle of Elders, a group of Nimíipuu elders.

Indigenist approaches draw collectively from community-based sources such as elders, cosmology, community concepts and stories, community supported sources such as dreams and visions, and teachers within the landscape to assist in interpreting knowledge (Cajete, 1999b; Kovach, 2009; Wilson, 2008). Dreams, visions, and intuition are validated sources for providing meaning and interpretation among indigenous communities (Cajete, 1999b; Kovach, 2009; Wilson, 2008). Sources and indicators are also embedded in the landscape to assist interpretation of knowledge; the participating community establishes these. Under the Nimíipuu research context participants often used similes to express meaning and understanding of life. Several participants described how the Nimíipuu are like salmon. Both Nimíipuu people and salmon have endured barriers, dams, reservations, and hatcheries. Through a shared struggle for survival, salmon provide meaning of resilience for Nimiípuu people. Similarly, the Nimíipuu are like wolves. Wolves are also survivors and they provide meaning for the importance of family, as each role supports the whole of the pack. Validating other beings' ability to provide knowledge and meaning, such as salmon and wolves, further stresses the indigenist axiological principle of equality among all beings. In addition, such expressions exemplify other principles of *tamá*lwit, like a part's relationship to the whole, as salmon and wolves guide Nimíipuu interactions with the world.

Table 13: Interpretation Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
INTERPRETATION OF THE DATA	Researcher interprets results from a statistical test and draws conclusions **Addresses:** • Whether the results were statistically significant? • How do the results answer the research question? • Did the results support the hypothesis? • How might the results be explained by the theory advanced in the proposed study, past literature as reviewed in the literature review, or logical reasoning that may contribute to a new theory?[xxxiv]	Interpretation of text and image data involves an iterative process of continual reflection about the data, asking analytical questions, and taking notes throughout the inquiry process This process involves interpreting themes that emerge from open-ended data and may involve coding data for themes) **Interpreting themes may involve:** • Using participants' perspectives on analysis • Existing theoretical frameworks or models • New theory development based on the data generated • Re-storying participants' narratives using structural devices and interpretation[xxxv]	Meaning is understood through guiding elders, stories, cosmologies, indigenous knowledge principles, and through participation [xxxvi] Stories require active creative participation from the storyteller and the listener, so that meaning can be exchanged Stories are often situated within a community's cosmology that provides further interpretation[xxxvii]	*Tamálwit,* Nimíipuu principles, oral traditions, stories, coyote stories, anecdotes, elders, specialists, and those respected for their knowledge help guide interpretation Interpreters or indicators are also embedded in the landscape to assist interpretation: Ex. Nimíipuu similes express salmon and wolves help teach and interpret meaning of one's own or the community's relationship to the land

m) Addressing the Quality of the Research

Validity, trustworthiness, and reciprocity of quantitative, qualitative, and indigenist approaches differ greatly as Table 14 shows. Quantitative research minimizes internal validity threats enabling the researcher to draw inferences from the data about the population. There are several strategies used to minimize threats that include randomly selecting participants, having a large sample size, limiting the interaction between treatment and control groups, and limiting the potential for maturation and history threats. External validity threats involve the results' generalizability to the general population. These threats can be minimized by restricting claims about groups that the results cannot generalize to, replicating the study later, and replicating the study in different settings to see if the results still follow (Creswell, 2009; Vellutino & Schatschneider, 2004). All of these measures are used to allow the researchers and participants who collect data to claim that the data is valid.

Qualitative research addresses trustworthiness of the inquiry to provide quality assurances. Transferability as opposed to generalizability is used, whereby the audience is doing the transferring to another context. This is dependent on thorough documentation by the inquirer. Reflective journals and documentation of activities will also support the quality of the research through the documentation of researcher biases and interpretations (Bailey, 2007; Bernard, 2011; Creswell, 2009; Fick, 2009; Patton, 2002).

Credibility provides assurance that the participants' views and the researcher's representations match; using member checking and triangulation ensures this. Dependability refers to the research process being logical and documented. Reflective journal pieces support the dependability of the research. Confirmability of the research refers to credible interpretations, of which member checking, peer debriefing, and reflective journals help to ensure. Authenticity is measured in part through thick description, member checking, and observations (Flick, 2009; Patton, 2002).

Similar to qualitative trustworthiness measures, indigenist approaches use the guidance of elders and other teachers, member checking, reflective journals, observation, triangulation, and close collaboration with the community to ensure quality of the research. Research is expected to reciprocate, benefit, and give back to the community, in this way the researcher is responsible for *relational accountability*. The researcher is required to respect the knowledge of the community by leaving it contextualized and attributing ownership of

the knowledge to the community, and not the individual, when appropriate (Cajete, 1999b; Kovach, 2009, Wilson, 2008).

In further support for indigenous ontological principles of *relationality,* the researcher must acknowledge that the research and its text are a part of a participatory experience involving the community, researcher, and audience. The text then becomes part of a dialectic process between the experiences of all those participating used to interpret the text and what is presented in the text. Similar to some efforts in quantitative research and the use of reflective journals in qualitative research, indigenist approaches' self-location, a process of situating oneself in relation to the research by being forthcoming and documenting inward knowledge, is a necessary part of the indigenist research process to ensure responsibility (Graveline, 1998).

For the Nimíipuu research context several techniques from both qualitative and indigenist approaches were used to ensure trustworthiness, authenticity, respect, reciprocity, and responsibility of the research and analysis. Member checking, whereby research themes and interpretation are discussed and verified with participants to increase credibility, confirmability, and authenticity, was one technique used during interview and consultation processes. Triangulation across interviews and participant observation, facilitated research credibility and confirmability as both data generation techniques supported the findings. Multiple source triangulation across Nimíipuu participants and secondary sources based on work with the Nez Perce Tribe also facilitated credibility of the themes generated. Theory triangulation facilitated interpretation credibility, as the findings were consistent with previous studies and the theoretical literature. Peer debriefing with participants including members of the Circle of Elders and a Nez Perce transcriber on themes also facilitated credibility and confirmability of the findings.

Under indigenist approaches researchers must ask themselves the following questions when engaging in research:

- "How do my methods help to build respectful relationships between the topic and myself, myself and the research participants?

- How can I respectfully relate to participants so to form a stronger relationship with the ideas that we will share?

- What is my role as the researcher and what are my responsibilities? Am I fulfilling this role to the participants, topic, and to all my relations?

- "What am I contributing to the relationship? Are the sharing, growth, and learning reciprocal?" (Wilson, 2008: 77).

Protocols for indigenist research are developed based on these questions and shared with participants. Outlining and sharing these objectives and protocols with participants help to ensure *relational accountability.* These questions were addressed and integrated into the Nimíipuu research design by using certain measures that are documented in the Tribe's research permit application. A related aspect of *relational accountability* is the issue of appropriateness; not all information shared with the researcher by the indigenous community should be shared publically. Some information, concepts, or even stories might be shared with the researcher for different reasons other than their direct public dissemination. Sharing the right information, in the right way, is a function of the quality of the research. Close collaboration with participants helps to ensure that these guidelines are followed.

Table 14: Addressing Quality Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTIC	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
ADDRESSING QUALITY OF THE INQUIRY	V*alidity*, *replication*, and *reliability* measures research quality[xxxviii] **Controls:** • Preparation of the setting • Response measurement • Replication	T*rustworthiness* and *authenticity* measures research quality[xxxix] **Measures:** • Dependability • Credibility • Confirmability • Transferability[xl]	*Reciprocity, respect,* and *responsibility* measures research quality **Measures:** • Relational accountability • Engagement • Collaboration • Self-location: documenting inquirer relationality[xli] • Reciprocity: giving back	*Téke* concept: reciprocity in giving back to the community [xlii] **Research Implications:** Research builds in measures to benefit and give back to the Nimíipuu community

n) Contextualizing & Presenting Findings

Display of data collected or knowledge gathered from sources can be expressed in many forms as Table 15 describes. Quantitative research presents statistical analysis of the data in tables. Findings are represented without situating the researcher within the research (Marsden & Wright, 2010; Graziano & Raulin, 2012). Qualitative approaches' self-reflection and indigenist approaches' self-location are practices in which the researcher's relation to the research is explicitly acknowledged in the findings. Such practices were utilized throughout the research process with the Nimíipuu because my place as a non-indigenous researcher and role as a newly appointed cultural resource manager were influential to the research. Such practices of reflection support the ontological proposition that it is through my subjective relationship with the world that I *come to know* reality.

As it is through one's subjectivity that reality is known, it is through the same process that we view and interpret research. Under an indigenist and Nimíipuu approach, with the presentation of the research findings the audience brings with them their own experiences, knowledge, and understandings as they interpret and relate to the findings presented. As such, the presentation of findings does not result in an objective end product. In situating this text *relationality* that is in relation to all its participants the text, contrary to quantitative presentation of findings, is not a representation, but is a text that invites the audience into a participatory experience.

Despite differing perspectives of a text and acknowledging audience relationality, quantitative and qualitative approaches use models to express relationships and theoretical interpretations as indigenist approaches use the participating community's symbols and metaphors. The Nimíipuu seasonal round (Figure 4) is a useful tool to express a depth of knowledge and diachronic connectivity the community has with the surrounding landscape.

Figure. 2. Nez Perce seasonal round. Source: Nez Perce Tribe, 2012.

This model illustrates the various seasons in Nez Perce language as they correlate to the changes occurring on the landscape as with the movement and practices of the Nimíipuu. It exemplifies the relationship the Nimíipuu have with specific plants and animals and the tools utilized to gather, hunt, and fish. Utilizing such images to present findings supports community-constructed symbols.

Other images including videos may also be used by qualitative and indigenist inquiry to display findings (Pink, 2001; Kovach, 2009). Qualitative approaches not only gather narratives, but also use narratives as a contextualized display of the findings (Flick, 2009; Kovach, 2009). Indigenist approaches, including the approach used in the Nimíipuu context, represent knowledge, themes, or findings through narratives, storytelling, coyote stories, anecdotes, metaphors, similes, symbolism, and practice so that meaning is contextualized and relational. In utilizing oral traditions as a device to present themes or findings, the teachings, principles, or propositions are contextualized in a teaching device supported and used by the participating community. Such was the case in presenting principles of *tamálwit* through the oral tradition concerning deer and wolf.

Traditionally, quantitative and qualitative research publishes findings in academic journals and books for outside audiences, focusing outward. However, there are recent efforts within these approaches to produce outputs for the participating community. Some indigenous communities are requiring proposals for such measures before approving research projects. For example, the Nez Perce Tribe's research permit asked how the data was going to benefit the community. Due to indigenous knowledge views of reciprocity, indigenist approaches strive to produce inward outputs for the community and participants (Kovach, 2010). In the Nimíipuu research context findings will be presented to the Nez Perce Tribe, Tribe environmental managers, and external agencies' land managers. In addition, knowledge gained will be integrated into cultural resource management through my role with the national forest.

Indigenist approaches maintain community ownership of knowledge by supporting indigenous intellectual property rights (Tuhiwai-Smith, 2001; Kovach, 2009; Wilson, 2008). In conjunction with these efforts indigenist approaches acknowledge participants for their knowledge in outputs, as such anonymity is only provided if desired by the participant. Nimíipuu participants will be and are acknowledged when desired in presentations and anonymity will be given when requested. Indigenist approaches also integrate collaborative measures with the participating community on contextualization and presentation of findings by offering co-authorships on published works (Kovach, 2009). Co-authorships and partnerships in public presentations will be pursued with Nimíipuu participants.

Table 15: Contextualizing and Presenting Findings Characteristics of Frameworks for Accumulating Knowledge

CHARACTERISTICS	FRAMEWORKS FOR ACCUMULATING KNOWLEDGE			
	QUANTITATIVE APPROACH	QUALITATIVE APPROACH	INDIGENIST APPROACH	NIMÍIPUU APPROACH
CONTEXTUALIZING FINDINGS	***Generalizability*:** Extending findings from a sample community to a larger population[xliii] **Models:** Utilizes models to explain theory[xliv]	***Transferability*:** The audience does the transferring of findings to other communities [xlv] **Models:** Utilizes models to explain theory[xlvi]	***Context Embedded:*** Representing knowledge as embedded within the community's cosmology, principles, and teaching devices.[xlvii] **Models and symbols:** Utilizes models and community-based symbols to illustrate meaning[xlviii]	***Tamálwit embedded:*** Represent Nimíipuu knowledge as embedded in *tamálwit,* oral traditions, and treaty rights activities **Symbols:** Utilizes Nez Perce teaching devices (e.g. stories, symbols, and similes)
PRESENTING FINDINGS	**Publications:** Findings published in peer-reviewed articles and books Some research projects explore ways of providing outputs for participants Some institutions require an IRB permit to work with communities[xlix]	**Publications:** Findings published in peer-reviewed articles and books And/Or Collaborate with community on publishing, acknowledging that some information may be omitted and acknowledging all collaborators' contributions in publication Some institutions require an IRB permit to work with communities[l]	**Publications and community outputs:** Community owns and has rights to the research generated Community is closely worked with on various forms of representing knowledge that may include publications, workshops, and presentations Narratives are a community and place-based medium commonly used to represent and teach meaning Collaborators' contributions are acknowledged in representation of findings Develop strategies for how the presentation of knowledge can give back to the community[li]	**Publications and community outputs:** Nimíipuu will continue to own their knowledge and will own raw data Collaborate with participants and others in the community on an appropriate and respectful way to present Nimíipuu knowledge. Acknowledge the participants who don't want anonymity. A presentation of findings incorporates benefits for the community (e. g. sharing findings with tribal environmental managers and external land managers) Incorporate pedagogical devices used by the Nimíipuu community to share knowledge such as stories and symbols

4) Conclusion

This chapter discusses components of quantitative, qualitative, and indigenist approaches, along with a Nimíipuu-informed approach to research. Described were potential tenets and practices for each approach. Paradigmatic assumptions under each approach illustrate epistemological and ontological differences in how a researcher's assumptions influence how and why research is conducted. As discussed, different types of research approaches are validated and supported under specific disciplines. Such an understanding is necessary when research attempts to reach across disciplines. Adoption of an inquiry strategy is dependent on the researcher's paradigmatic assumptions, which informs the types of research questions asked and the perceived range of possible ways to answer such questions. Theory serves different roles in research depending on the approach. Theories originating from individuals and communities outside of the participating community can influence how those communities are represented. Supporting community cosmology, interpretation, and explanation shifts the control of representation from the researcher to the community.

Researcher and participant control is also influenced by language, methods, and sources supported by the research. Vocabulary and conceptualization of relationships utilized by these approaches support different types of audiences. As indigenist and Nimíipuu approaches integrate community-based vocabulary and conceptualization of relationships, community formed knowledge and audiences are supported. For example, by adopting Nimíipuu terms and views toward relationality Nimíipuu knowledge and cosmology is supported as opposed to further validating outside theorist's' explanations of Nimíipuu phenomenon. Shifts in control from the researcher to the participating community also occur under sampling and selection strategies. Through techniques such as chain-referral, that is using referrals from participants, those within the community help decide important individuals to include in the research.

Although, types of methods and sources overlap across research approaches, such decisions by the researcher entail a higher or lower degree of community control. For example, open-conversational interviews enable participants to steer the progression of the interview process, highlighting key topics important to them and expressing such ideas under their own discourse. Primary and secondary sources are utilized under all of the

approaches; however, some sources such as dreams or visions supported by indigenist approaches may not be validated by other approaches.

The resultant data type derived by the utilization of different methods and sources influences how the data is structured, interpreted, and assessed for its quality. Quantitative data tends to be numeric whereby statistical analyses are conducted. Qualitative and indigenist approaches tend to have text or image data from which textual, narrative, and observation analyses can be done. Interpretation of data can be supported by tests, theory, and collaboratively with the participating community. Regardless of the differences between approaches, all have adopted measures to assess the quality of the research. These measures vary from the ability of the research to be replicated to relational accountability of the researcher. It is important to utilize the measures for research quality that are best appropriate with the research design. For qualitative and indigenist research approaches it may be inappropriate for the data to be replicable as subjectivity between the researcher and community is supported. Using replicability as a standard for measuring the quality of qualitative and indigenist research approaches may lead to the ungrounded de-legitimization of the research.

Much like with addressing the research quality, special attention must be paid to the contextualization of findings across research approaches. Contextualization of findings within quantitative research emphasizes generalizability to a larger population. Contrary to such extrapolations, qualitative researchers argue findings are context specific therefore generalizability of such findings are often inappropriate. The findings, however, may or may not be transferable outside of the participants. Under such a process, the audience attributes transferability of the findings to provide further meaning, not the researcher. Such a process is similar to that of interpretation of artwork, whereby the viewer attributes meaning to the art piece. Indigenist approaches argue findings must be represented within the community and place-based contexts from which they were delivered. As Nimíipuu participants' knowledge is embedded within Nimíipuu-landscape relationality, it is best from these specific contexts that the research findings be presented.

Although this chapter articulates characteristics of quantitative, qualitative, indigenist, and a Nimíipuu informed approaches categorically in the table, components of each approach are not mutually exclusive. As such, quantitative research can and most

certainly is conducted by Nimíipuu people despite possible paradigmatic differences. Rectifying the inconsistencies and contradictions is up to the individual expression of each researcher or individual interested in a process of *coming to know*. More important of an objective, is the adoption of research efforts that support self-determination and tribal sovereignty for indigenous communities. Integration of collaborative efforts, community benefits, and the community's epistemic, ontological, and axiological principles within the research process at any level or degree is a step toward the right direction.

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Endnotes

[i] This research fulfilled requirements for a Master of Arts in Environmental Anthropology at the University of Kent, Canterbury U.K.

[ii] This oral tradition is told by many Nimíipuu elders and it has been documented in a Nimíipuu story, *Origin of the Sweathouse* told in Nimíipuu language by Lewis D. Williams, a Nimíipuu.

[iii] Column sources: Creswell, 2009 and Guba & Lincoln, 2005

[iv] Section sources: Curry, 2003 and Joubert & Davidson, 2010

[v] Section source: Guba & Lincoln, 2005

[vi] Section source: Curry, 2003

[vii] Column source: Cajete, 1999b

[viii] Tamálwit: a law, ordinance, commandment, constitution, or government (Aoki, 1994)

[ix] Column source: Cajete, 1999b

[x] Section sources: R. Frey, personal communication, October, 2012 and Kovach, 2009

[xi] Column sources: Bernard, 2011 and Creswell, 2009

[xii] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009)

[xiii] Column sources: Cajete, 1999b and Kovach, 2009

[xiv] Column sources: Bernard, 2011 and Creswell, 2009

[xv] Column sources: Bernard, 2011 and Creswell, 2009

[xvi] Column sources: Wilson, 2008

[xvii] Column sources: Bernard, 2011 and Creswell, 2009

[xviii] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009

[xix] Column sources: Kovach, 2009

[xx] Column sources: Bernard, 2011 and Creswell, 2009

[xxi] Column sources: Bailey, 2008; Bernard, 2011 and Creswell, 2009

[xxii] Section sources: Cajete, 1999b

[xxiii] Section sources: Kovach, 2009; Wilson, 2008, Wolf & Rickard, 2003

[xxiv] Column sources: Bernard, 2011 and Creswell, 2009

[xxv] Column sources: Bernard, 2011 and Creswell, 2009

[xxvi] Column sources: Cajete, 1999b; Kovach, 2009 and Wilson, 2008

[xxvii] Column sources: Bernard, 2011 and Creswell, 2009

[xxviii] Section sources: Bailey, 2007 and Bernard, 2011

[xxix] Section source: Dundes, 1980

[xxx] Column sources: Cajete, 1999b; Kovach, 2009 and Wilson, 2008

[xxxi] Column sources: Bernard, 2011 and Creswell, 2009

[xxxii] Column sources: Bailey, 2007 and Bernard, 2011

[xxxiii] Column sources: Cajete, 1999b; Kovach, 2009; and Wilson, 2008

[xxxiv] Column sources: Bernard, 2011 and Creswell, 2009

[xxxv] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009

[xxxvi] Section sources: Cajete, 1999b; Kovach, 2009; and Wilson, 2008

[xxxvii] Column sources: Cajete, 1999b; Kovach, 2009 and Wilson, 2008

[xxxviii] Column sources: Bernard, 2011 and Creswell, 2009

[xxxix] Devices for enabling trustworthiness and authenticity include triangulation, member-checking, and peer-debriefing (Bailey, 2007; Bernard, 2011; Creswell, 2009)

[xl] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009

[xli] Column sources: Graveline, 1998 and Kovach, 2009

[xlii] Literal definition is to distribute (food), give (food), divide, portion, and share (Aoki, 1994)
[xliii] Column sources: Bernard, 2011 and Creswell, 2009
[xliv] Column sources: Bernard, 2011 and Creswell, 2009
[xlv] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009
[xlvi] Column sources: Bailey, 2007; Bernard, 2011 and Creswell, 2009
[xlvii] Column sources: Cajete, 1999b; Kovach, 2009 and Wilson, 2008
[xlviii] Section sources: Kovach, 2009
[xlix] Column sources: Bernard, 2011 and Creswell, 2009
[l] Column sources: Bernard, 2011 and Creswell, 2009
[lili] Column sources: Kovach, 2009 and Wilson, 2008

Chapter 3: *All My Relations:* Nimíipuu Perspectives on Environmental Management

1) Introduction

Environmental managers' collaboration with indigenous communities is increasing worldwide as management agencies are recognizing the beneficial contributions indigenous knowledge can make to resource management (Armitage et al., 2009; Berkes, 2009, 2012; Butler, 2006; Kristofferson & Berkes, 2005; Menzies, 2006; Parlee & Berkes, 2006; Tang & Gavin, 2010; Usher, 2000). As such, research is being done on how environmental management agencies can integrate traditional ecological knowledge (TEK) into existing management structures (Joubert & Davidson, 2010; Klooster, 2002; Knight, 2000; Kristofferson & Berkes, 2005; Kosek, 2006; Nadasdy, 2003a, 2003b; Parlee & Berkes, 2006; Sejersen, 1998; Sherman, 2010). Presented here are ethnographic research findings that contribute further to the body of work concerning TEK and environmental management. The research explores Nez Perce tribal members' knowledge of and relationships with the landscape along with their perspectives of environmental management entities and practices. This chapter serves as both a descriptive articulation of the research findings and it exemplifies the importance of understanding community-specific and place-based principles for collaborative processes in both research and environmental management.

The notion of TEK is defined as "all types of knowledge about the environment derived from the experience and traditions of a particular group of people." This concept encompasses all forms of TEK by various types of social groups that may include cattle ranchers, loggers, and indigenous communities (Usher, 2000). Indigenous knowledge, on the other hand, is a term specifically associated with indigenous communities. It is defined by collaborative management theorists as a knowledge–practice–belief system that is diachronic, generationally transmitted, and is "fundamentally linked to ecology" (Berkes, 1999; Tang & Gavin, 2010). Due to the potential benefits on environmental management, Canada has established a national environmental management policy mandating the use of TEK in management regimes (Usher, 2000). In the United States, Section 106 of the National Historic Preservation Act mandates consultations with American Indian tribes over federal undertakings; IK plays a significant role under such consultations. As a result of these directives, IK is viewed as a management tool that can assist environmental

assessment (Usher, 2000) as indigenous communities may have both baseline knowledge for local ecosystems and diachronic observations based on continued experiences within those ecosystems.

Despite the potential use of IK in environmental management, questions remain whether environmental management philosophies and structures are compatible with IK. Concerns exist about non-indigenous mangers' ability to value IK, and that integration threatens the integrity of IK under the existing management structures (Joubert & Davidson, 2012; Nadasdy, 2003a). Due to paradigmatic differences, when IK is integrated, agencies often establish a maximum degree of incorporation, while being careful that the token amount of integrated IK aspects does not exceed this threshold (Kristofferson & Berkes 2005, Nadasdy 2003a, 2003b, West et al. 2006). Because of this, misunderstandings ensue if environmental managers lack the contextual community-specific and place-based understandings of IK.

Such paradigmatic differences become apparent when environmental management practices emphasize the value of secular and objectivist scientific knowledge to form the basis of management philosophies (Kristofferson & Berkes, 2005). Under this form of knowing, valid knowledge is that which is exclusively obtained through repeatable measurement and analysis, limiting the influence of subjectivity (Guba & Lincoln, 2005). In addition under environmental management, notions of natural and cultural resources are rooted in a commodified view of the landscape. Such management structures imply a nature-culture dichotomy whereby natural and cultural resources are viewed as unconnected entities that can be managed under detached departments.

In contrast, IK relies heavily on cosmological, community, and placed-based contexts to develop and interpret a *coming to know* of the land that forms human-landscape *relationality*. Perceptions of the landscape are rooted in the ontological view of the landscape being imbued with ‘spirit’ as its features, often described as relatives, are both alive and are teachers requiring respect (Cajete, 1999a, 1999b; Kovach, 2012; Personal communication with Nez Perce tribal members, 2009, 2011-2013; Wilson, 2008). Epistemological views of how to *come to know* the landscape and interpret one’s relationship with the landscape support a view that it is not through objective interaction that one gains an understanding of the world. Instead it is through *relationality*, one’s active and

subjective engagement with the landscape, its teachers, and the community that one is taught how to *come to know* (Cajete, 1999b; Ingold, 2011; Kovach, 2012, Wilson, 2008).

In addition to recognizing the paradigmatic concerns between environmental managers and indigenous communities, it is important for the political and historical contexts to be acknowledged when participating in collaborative efforts involving IK. Not only is IK being viewed as an aid to environmental management, it is also viewed as a political tool for tribal sovereignty and self-determination. Tribal sovereignty i.e., the economic, social, and political inherent authority of indigenous people to determine their own future, and self-determination i.e., self-governance (Wilkins & Kiiwetinepinesiik Stark, 2011) both impacts the use and expressions of IK (Felt, 1994). It is imperative to understand that, "the use of Indigenous knowledge is a political act-it is a claim of Aboriginality, an assertion of land and resource rights, and a demand for management power" (Butler, 2006). Under this form, involving IK into broader collaborative management policies requires adaption to the broader social and political situations in which such management occurs.

a) Research Context

The Nez Perce Tribe, also known as the Nimíipuu, is a part of the Sahaptin language-speaking people. Nimíipuu creation stories describe a people placed on the landscape by Coyote (Nez Perce Tribe, 2003; Taylor, 2012). Their aboriginal territory consisting of many various Nimíipuu bands included parts of Washington, Oregon, and Idaho. Those dwelling within a given place were often known by the nearest river drainage and the Nimíipuu name for the area. The Indian Claims Commission determined that the Nimíipuu land base encompassed 13,204,000 acres (Nez Perce Tribe, 2003). The seasonal availability of plants and animals encouraged movement across various ecosystem types - contributing to a great knowledge of and relationship with the landscape. The Nimíipuu community express this knowledge and the sense of *relationality* continues to be shared; "Creation stories, myths, and legends tell us of our humble beginnings, although they also remind us of much that we have learned from the creation and the creatures around us" (Nez Perce Tribe, 2003).

Figure. 1. *Ilcwe wcixnim timíne*, Heart of the Monster, place of a Nimíipuu creation story near Kamiah.

The Nez Perce Removal Era that spanned from 1855 to 1893 greatly reduced the Nimíipuu land base to its current Idaho reservation size of 750,000 acres (Figure 2). Through the Treaty of 1855, Nez Perce fishing, hunting, gathering, pasturing, and other rights were reserved at "usual and accustomed places" and open and unclaimed lands. “Usual and accustomed” places refers to the lands where the Nez Perce Tribe usually traveled to or was accustomed to traveling to for fishing, hunting, gathering, and pasturing purposes. Fishing locations, that are “usual and accustomed” places are situated on and off the reservation and include areas from Portland, Oregon to Montana (Nez Perce Tribe, 2003). Practices at “usual and accustomed” places and open and unclaimed land, being public land such as Forest Service lands, are continually exercised on the landscape. The Tribe has approximately 3,500 enrollees with the seat of the government located on the reservation in Lapwai, Idaho. Many of the Nimíipuu on the reservation live, upriver (Kamiah and above), downriver (Lapwai area), *Aspacha* (Orofino area), and outside the reservation, on the Palouse (Nez Perce Tribe, 2003).

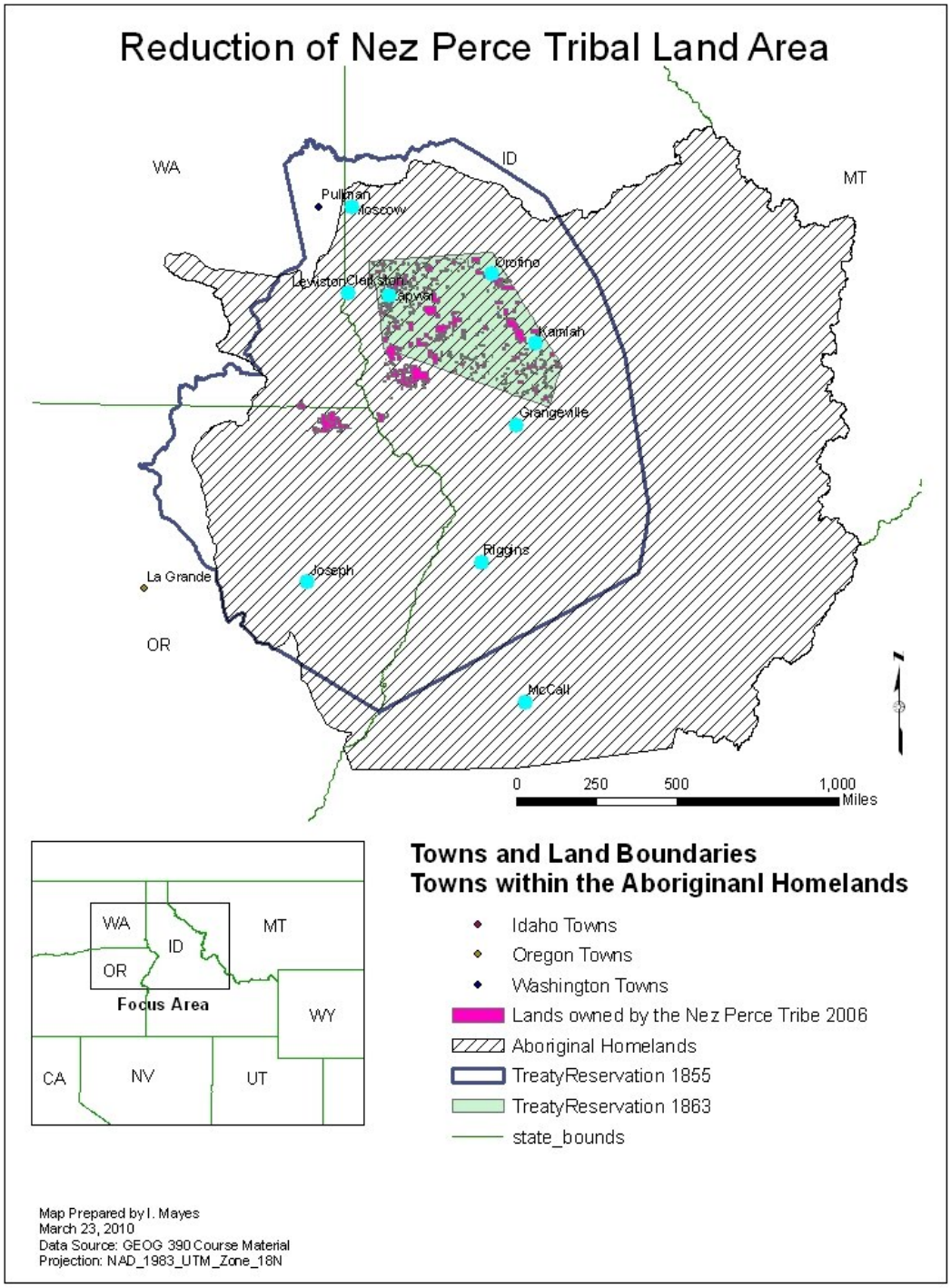

Figure. 2. Map showing the political landscape of the Nez Perce Tribe's aboriginal territory. Source: Mayes (2010).

Environmental management of Nez Perce Tribe lands and its features both off and on the reservation is organized under the following departments and divisions (Table 1). The Natural Resources Department has seven programs under a direction to, "support the cultural and natural resource concerns of the Nez Perce Tribe through implementation of projects in the 1863 Reservation Boundary, ceded territory, and usual and accustomed places and also through technical consultation with the state and federal agencies" (Nez Perce General Council Report, 2012, p.59). The Nez Perce Tribe engages in consultations with several national forests in the states of Idaho, Washington, and Oregon along with Yellowstone National Park and many state and federal fish and wildlife management entities. The Tribe's Fisheries Resources Management's mission is to, "recover and restore all populations and all species of anadromous and resident fish within the Nez Perce territory" (Nez Perce General Council Report, 2012, p.45). As exercised, the "Nez Perce Tribe's fisheries program is the most active entity in restoration of fish throughout the Snake River Basin" (Nez Perce General Council Report, 2012, p.45).

Table 1: Nez Perce Tribe's Environmental Management Departments and Divisions

NATURAL RESOURCES DEPARTMENT	FISHERIES RESOURCES MANAGEMENT DEPARTMENT
NATURAL RESOURCES	CONSERVATION ENFORCEMENT DIVISION
CULTURAL RESOURCES	HARVEST DIVISION
ENVIRONMENTAL RESTORATION & WASTE	PRODUCTION DIVISION
FORESTRY & FIRE MANAGEMENT DIVISION	RESEARCH DIVISION
LAND SERVICES	RESIDENT FISH DIVISION
WATER RESOURCES	WATERSHED DIVISION
WILDLIFE MANAGEMENT DIVISION	

2) Methods

Described below are the research methods, they are reiterated in this Chapter (discussed previously in Chapter 2) because the methods used help to contextualize the research findings. The research this chapter is based on utilizes indigenist theory and Nimíipuu concepts, propositions, and principles to inform the ethnographic process. Indigenist theory is a research framework with epistemological and ethical components. In referring to it as indigenist, rather than indigenous research, the approach becomes inclusive and without promotion of racial exclusivity. These components inform the research process,

supporting not only collaborative and applied strategies, but also the integration of community specific ontological, epistemological, and axiological principles into the research design (Denzin & Tuhiwai-Smith, 2008; Four Arrows, 2008; Kovach, 2009; Steinhauer, 2002; Struthers, 2001; Tuhiwai-Smith, 2012; Webber-Pillwax, 2001; Wilson, 2008). Adopting such a framework reconstructs the research process to one collaboratively created, in which the control is shifted from the researcher to the community situating all those involved, including the researcher, *equally* as participants.

In support of developing a collaborative process and understanding Nimíipuu paradigmatic components, relationships were built with community members in 2009 through exploring Nimíipuu perspectives of wolves and the Tribe's role in the Idaho gray wolf reintroduction (Cortes-Vazquez & Zedalis, 2013; Zedalis, 2009). To continue such relationships, gain further understanding of Nimíipuu management philosophies, and to integrate research benefits to the community the research topic, research permits, methods, and ethical considerations for the research were co-generated with several Nez Perce tribal members through informal consultations that began in 2011. During this process, such things as interviewing techniques, literature review, and situating myself in relation to the research were discussed with collaborators. In addition, documents, such as research permit applications and the research proposal were shared with collaborators for their review prior to submission. The resultant output of these informal consultations with tribal collaborators was their support in a research topic exploring: Nimíipuu knowledge of the landscape, perspectives of environmental management, and the existent and potential use of Nimíipuu knowledge into environmental management.

To address this research topic and support Nimíipuu *coming to know* processes, an ethnographic approach was utilized. Ethnography, a methodology that supports open-conversational interviewing and participant observation, enables the researcher to be situated equally as a participant, as tribal collaborators are able to assist in the constructing of their stories. This methodological approach involves addressing the text, context, and texture of one's findings. The text refers to what is actually said or seen. The context is the environment in which things are said or seen, and the texture describes the way in which things are said or seen (Dundes, 1980). An ethnographic approach allows for thick description and an in-depth understanding of the research topic to enable participants to

elaborate on their complex perspectives through an inductive and iterative process (Atkinson & Hammersley, 1994; Bernard, 2011; Creswell, 2009; Hammersley, 1992; Kottak, 1999; Pelto, 1970; Willis & Trondman, 2000). Combined with indigenist theory, including its collaborative and applied components, an ethnographic design assisted the use of Nimiipuu principles and structures to inform inquiry methodology and axiology.

The methods supported by this indigenist informed ethnography consisted of open-conversational interviews, gathering oral traditions and other forms of stories, and participant observations. A total of 14 Nimíipuu tribal members were interviewed including 8 males and 5 females ranging in ages from 24-75. The duration of the interviews ranged from one to four hours; they were often held over food and in informal settings. To establish relational accountability, a relationship built on respect and reciprocity with the participants (Steinhaur, E. 2002; Wilson, 2008), interviews often involved several meetings and encounters with participants during which the researcher's background, assumptions, and roles were discussed. A point of saturation, during which research themes are apparent, repeated by several participants, and little new information arises during interviews (Bernard, 2011), occurred with the 10th interview of the research process. All interviews were audio recorded, transcribed, and coded for topical themes. A Nez Perce tribal member assisted in transcribing interviews with those participants who did not request anonymity.

Participant observation in Nimíipuu and Forest Service events, activities, and land management processes that began in 2011 all assisted in the triangulation of knowledge gained from interviews and secondary sources. These secondary sources include the outputs from previous research and projects involving the Nez Perce Tribe. Participation and observation in Forest Service events were enabled through the author's position, as a cultural resource manager, with a national forest in Idaho that consults with the Nez Perce Tribe. The types of events involving the Nez Perce Tribe and federal entities included federal-tribal consultations, workshops concerning significant landscapes, and a federal-tribal field visit to a significant landscape. Outside of the federal land management arena, participation and observation was exercised in various Nez Perce Tribe events such as powwows, cultural conventions such as basket weaving, fishing events and activities, and presentations. The research process was also informed by four consultations with the Circle of Elders, a Nimíipuu elder committee. These meetings contributed to the gathering and interpreting of Nimíipuu knowledge and perspectives

of interactions with external agencies and their environmental management. Events were documented by note taking and reflective journal pieces.

The analysis of research materials was rooted in an organic and inductive process in which major themes from the research experience emerged. This inductive or open-coding process involves a close study of and familiarization with the research texts (Bernard, 2011). As such, once interviews were transcribed, I closely read through them only highlighting excerpts and quotes that were of particular importance to the interviewees as suggested by the text, context, and texture in which things were said. An importance to excerpts was also attributed when the theme was repeated throughout the interview and among other interviewees, and when themes correlated with participant observation experiences and researcher reflections.

Themes were attributed to the texts using a key in which themes were categorically organized. The following topologies emerged: epistemological themes, ontological themes, axiological themes, Nez Perce community organization and characteristics, oral traditions, Nimíipuu-land relationship, perspectives of land management, tribal management, federal and state management, tribal-agency relationship building strategy, and tribal-non-tribal relations themes. The key also included brief descriptions often using the language of participants and codes using phrases of the participants and the researcher. Some themes had subthemes in which sub codes were also generated. This key was initiated with the first transcription read and was expanded as reviews of the texts continued. Interviews were transcribed and coded shortly after the interview. Transcriptions were read several times as new themes and codes would be generated throughout the process and would need to be added to the preceding transcriptions, if the themes were not noticed with the initial review.

The following section describes the major findings that emerged from the research process by presenting some of the major themes encountered in the interviews with Nez Perce tribal members. These themes were repeated by tribal collaborators and were triangulated with participant observation and second sources involving other projects with the Nez Perce Tribe. Themes were collaboratively interpreted by consulting indigenist literature, Nimíipuu principles, primary and secondary sources, the Nez Perce Tribe's Circle of Elders, peer debriefing with a Nez Perce transcriber, and member checking with participants both during and after the interview process.

3) Findings

The following described emergent themes concerned issues relating to treaty rights, Nimíipuu-landscape interactions, and education. In statements I organize under the theme treaty rights, collaborators express the view that such rights help maintain Nimíipuu practices on the landscape and that these rights influence relations with the general public and external environmental managers. These interactions, and the major barriers posed to maintaining treaty rights, are discussed. The theme, Nimíipuu-landscape interactions, includes Nez Perce expressions of how principles of *nimíipuum inmiiwit*, the Nimíipuu seasonal round and *tamálwit*, a Nimíipuu law or philosophy, structure relationships with the landscape and different agent's involved with the landscape. The theme education, includes views concerning the education of tribal membership and the benefits and drawbacks to educating the general public and external environmental managers. In the next four sub-sections, the views pertaining to each theme are described in more detail, and as much as possible in the collaborator's own words through the use of block quotes from interviews with these tribal collaborators.

a) Treaty Rights

A recurrent theme among collaborators was the importance of exercising treaty rights. By treaty rights, collaborators typically meant practices of hunting, fishing, gathering, and pasturing animals in places designated by the special phrase, “usual and accustomed” places. The phrase refers to a clause in the 1855 Treaty, and is defined as those locations the Nez Perce usually and were accustomed to traveling to for these practices. These locations contemporarily exist inside and outside of the reservation boundaries. The Treaty of 1855 both supports and hinders tribal sovereignty for the Nez Perce Tribe. While the Treaty was instrumental in the loss of rights over specific land outlined in the Treaty for the Tribe, the rights explicitly retained by the Nimíipuu with the Treaty of 1855 enable contemporary Nez Perce tribal membership to continue their hunting, fishing, gathering, and pasturing rights at “usual and accustomed” places and on open and unclaimed land.

More importantly, these retained rights, which are recognized as always existing based on the legal foundations of tribal sovereignty, treaty provisions, and the "reserved rights" doctrine, greatly contribute to and help maintain Nimíipuu *relationality* with the landscape. For many collaborators, the term "treaty rights" can be used to express any of

four different, inter-connected things; a) the legal right protecting certain actions, b) the actions themselves, c) access to areas pertaining to the exercise of these actions, and d) the landscape features that are the direct object of these practices, for example salmon. Because of the expansiveness of the notion of "treaty rights," it is no surprise that the activities secured by the 1855 Treaty, and of course the traditions that vastly pre-date the Treaty, are viewed as important expressions of Nez Perce identity. As the following tribal collaborator articulates,

> People have a real fuzzy misconception of treaty rights and what they entail and represent. It's more about what I am talking about as opposed to the right to just go shoot something or catch something. It's a lot deeper than that. That's the way and how we perpetuate our identity as Nez Perces by doing those things. Going into what I talked about just previously its our main way in which we maintain that relationship with the land, is by doing those sorts of things. Not only do we benefit from it, but the resource benefits from that. We cannot let that go. We can't let that relationship go. It's not always about fishing, hunting, or gathering (NezPerce tribal member A, 2013).

As this tribal collaborator explains, in exerting treaty rights, a relationship with the landscape is maintained and Nimíipuu identity is perpetuated.

Tribal collaborators often described a Nimíipuu-landscape co-dependency; when treaty right infringement occurs their *relationality* suffers. This *relationality* is built on physical, mental, and spiritual components as one collaborator points out,

> That is why these locations are so important. They are tied to our physical health, our spiritual health, our mental health, they are basically our survival. So, when we go back out to these places and we are doing something as simple as gathering firewood that's cultural maintenance. That's health maintenance (Nez Perce tribal member B, 2013).

The protection of the landscape through exerting treaty rights is of great importance as a consequence of this *relationality.* Figure 6 shows a *qémes*, *Camassia quamash*, camas, meadow that is no longer accessible to Nez Perce tribal membership as it is located on private property; such land borders create *relationality* borders. In addition, private property boundaries prohibit access affecting the health of the Nimíipuu community and the health of the landscape.

Figure. 3. *Qémes* meadow, near Tolo Lake, once used by the Nimíipuu, the meadow is now on private property.

Impacts to Nimíipuu-landscape *relationality* are further exemplified in the following discussion about *qémes* gathering. *Qémes* meadows, without ground disturbance from gathering have small bulbs and small patches as a tribal elder explains,

> There's another good meadow, and that's up at Lolo Flats, called [Place name removed], it's loaded with *qémes*, but its all small. And I don't know, but what they probably need up there is ground disturbance to make it more prolific, and bigger. So there's probably other meadows in the same condition, and I'm sure there are some around McCall too, so there's a lot of meadows out there (Nez Perce tribal elder C, 2013).

Not only does the health of *qémes* depend on its relationship with the Nimíipuu, Nimíipuu health depends on the *qémes*. This elder continues to explain,

> When I was a child, my mom and dad were out, raising garden, and dig *qémes* and *cous*, and roots. Part of the problem is just having to travel to go to these places. And to have it available is another problem. What used to be

> isn't' there any more…But now, we're plagued with diabetes, heart problems, strokes, you know those kinds of things, and so, now, that's why I said we need more access to *qémes* because that's a good source of protein, carbohydrates, and sugar (Nez Perce tribal elder C, 2013).

As this tribal collaborator explains, the noncontiguous access to hunting, gathering, and fishing locations results in the discontinuity of landscape and community health. Environmental management support for treaty rights and access to places such as *qémes* meadows in McCall helps to sustain Nimíipuu-landscape *relationality*, community health, and biocultural diversity.

i) Barriers to Treaty Rights

When treaty rights are infringed upon for various reasons, such as property boundaries, management practices, or by other land users, Nimíipuu-landscape relationships are negatively impacted. Several aspects threaten the maintenance and protection of Nimíipuu treaty rights. Nimíipuu ancestral homelands include parts of Oregon, Washington, and Idaho, maintaining access to some specific locations is, at times, simply logistically difficult, both financially and physically. When tribal members hunt, gather, and fish at these locations, encounters with other land users often presents its challenges, as one tribal collaborator recounts below,

> So there were maybe four tribal members out there hunting and they were actually getting shot at by some actually non-native trespassers in the reserve. (Nez Perce tribal member, Ciarra Greene, 2013).

Most tribal collaborators had their own stories concerning negative encounters, as a result, many of them explained they try and exercise treaty rights activities when they think other land users won't be around.

Many tribal collaborators described situations in which interactions with the general public led to infringement on tribal treaty rights. The following example describes a lack of awareness by the general public of the Tribe's role in fish restoration efforts. In addition, the example highlights a misunderstanding by the general public that because the Tribe doesn't buy State licenses they should have less right to fish. The following tribal collaborator states,

> We've had some other issues with sport-fisherman, and the, what I call, I call it 'infringing' on fishing rights, especially on the reservation…This same guy,

> says, well if it wasn't for me, you wouldn't even have fish… He bought fishing licenses, and tags and stuff, and that revenue went towards creating fish. Of course, that was kinda the wrong thing to say, to *me*. 'Cause then I tore into him, and said, well how do you figure that, and started to fire off at him what I do, and this is what we do, and it's because of our treaty right that there has to be fish. So, through federal court cases, and everything else, that's why we have fish, and why we push for fish, and why you have fish to fish on (Nez Perce tribal member, Aaron Penney, 2013).

Such instances like these, as tribal collaborators described, make it difficult to continue hunting, fishing, and gathering practices when they have to deal with hostile encounters with the general public.

Hostile encounters with the general public highlight not only misunderstandings that involve State versus tribal treaty rights, these encounters also pose barriers for access. The following example explains,

> Some new owners took over it, last year, a family, and then this year a new guy just bought it. And they went down there, two weeks ago, to go to the lodge, and the guy put up a sign, that said, 'no trespassing'. They were going to the lodge to go to the gift shop, and ran into that guy, and he was unfriendly - what are you doing here? Didn't you read the sign, I don't want people trespassing here - and of course then he got, my cousin told him about treaty rights, and access, and so forth, he was like, you know what that is, and the guy was like, no (Nez Perce tribal member, Aaron Penney, 2013).

A lack of knowing treaty rights by the general public, as many tribal collaborators pointed out, leads to an inability to access "usual and accustomed" places for treaty rights activities. As the above tribal collaborator points out access to locations can be impacted by the changing of landowners, effecting fishing, hunting, and gathering practices in those areas. Similarly, the following tribal collaborator explains how encounters with the general public affect decisions to travel to "usual and accustomed" places. She states,

> My brother remembers that because he was little, too, when we were walking up the creek scaring the fish up and it's just like, we want to go back. Because that's where mom gaffed her first salmon, so we want to go back, and we haven't been; because for me, number one, it's being leery about the area. How are the people down there? What are they going to say to us when we get down there? Is it going to be worth it to go through the battle for us to go down there and fish? (Nez Perce tribal member, Yolanda Bisbee, 2013).

As this tribal member explains, maintaining a connection to places like those visited as a child where your mother gaffed her first salmon is challenged by the thought of having negative encounters with the general public. Concerns like these are considered when decisions are made by tribal membership to maintain access to places.

The unique legal relationship the Tribe has to other agencies and their jurisdictions situates the Nez Perce Tribe different from interest groups, yet the Tribe struggles to assert the authority their positions should hold given a history of treaty rights and case laws. In the following passage, a tribal elder explains the Tribe's struggle to assert their positions over interest groups' livelihood claims,

> When we say we gotta save this species or landscape they say, no you're taking my lifestyle away from me, so you're not gonna do that. I'm here to cut a tree down. I'm here to raise crops. You know, don't bother me, leave me alone. I have a right to all these resources. Well, so do we, and we have it in a treaty that says that we do. See, but no one considers our request to enhance these species for our benefit, because they think we're just another interest group trying to take something away (Nez Perce tribal elder C, 2013).

This elder describes interest groups' asserting rights to resource extraction by appealing to lifestyle or livelihood claims. He explains these arguments contrast with Nez Perce Tribe treaty rights and yet they still hold weight with environmental managers through collaborations and coalitions with such groups.

In addition to barriers posed by factions of the general public, environmental management also poses barriers. For example, law enforcement officers who are uninformed of Treaty rights sometimes stop tribal members from activities that are otherwise prohibited to the general public. Such institutionalized barriers involve the Nez Perce Tribe and its membership having to reaffirm their position as a tribal sovereignty with treaty rights and a unique government-to-government relationship with the United States. Constant altercations involving treaty rights issues led to one collaborator's decision to constantly carry information on treaty rights, written on water-proof paper, in order to diffuse any potential obstruction of his activities.

Barriers that arise from encounters with external environmental management include asserting tribal presence and access to National Park lands. The following passage highlights the struggles the Tribe has with National Parks to maintain their treaty rights. He explains,

> The number two person in charge of Yellowstone used to be the Park Superintendent at Spalding, the Nez Perce National Historical Park. He transferred to Yellowstone, and he was like the number two person. And he went out with us on a trail ride, and I was kinda razing him about fishing, 'cause I wanted to go fishing; we were gonna be on Nez Perce Creek. And I told him, I brought my fishing pole, and he'd always go, did you get your license, and I'd go, for what? [He said] To fish inside the park. [I said] On Nez Perce Creek? I didn't get a fishing license, and [he said], you have to, and I was like, why do I have to, the Treaty Right still exists for the Park (Nez Perce tribal member, Aaron Penney, 2013).

Ironically, as this tribal collaborator points out Yellowstone National Park management both honors and limits Nez Perce presence within the Park. Park management strategies honor the Tribe's presence through referent place names yet fail to honor contemporary practices and tribal treaty rights to the Park. Requiring fishing licenses for Nez Perce tribal membership to fish in Nez Perce Creek simultaneously celebrates and limits Nez Perce presence in the Park. These struggles exemplify the challenges involving external environmental management regimes support for treaty rights.

b) Nimíipuu-Landscape Relations

One major theme, or teaching, that emerged from the research involved Nimíipuu relations with the landscape. Tribal collaborators described having a relationship with the landscape built on equality, interconnectedness, and reciprocity. As tribal members discussed their perspectives of environmental management, woven into their testimonies were teachings about how they relate to the landscape. The nature of their relationship describes a coming from and a history in, since time in memorial, the surrounding landscape. Features on the landscape signify this diachronic relationship, taught through the place-based oral traditions they symbolize. Illustrating a Nimíipuu relationship with the landscape are two structures, *nimíipuum inmiiwit* and *tamálwit*. *Nimíipuum inmiiwit*, refers to the Nimíipuu seasonal round, that teaches and symbolizes Nimíipuu knowledge, practice, and movement on the landscape. As tribal collaborators illustrate, *tamálwit*, is a law, treaty, or set of principles that guide Nimíipuu interactions with the world. These community-specific and place-based structures teach knowledge, connection, and ethical motivations concerning Nimíipuu relationships with the landscape. Further described below, *nimíipuum inmiiwit* and *tamálwit* assist in informing Nimíipuu participants' perspectives of environmental management.

i) *Nimíipuum Inmiiwit*

Like *tamálwit*, *nimíipuum inmiiwit* or the seasonal round, also influences Nimíipuu relationships with the landscape. Figure 4 is a diagram developed by tribal members Anthony Smith and Josiah Pinkham to illustrate the *nimíipuum inmiiwit*. This diagram of the seasonal round expresses knowledge about the landscape, changes occurring on the landscape, movement, and connectivity between the seasons. It expresses changes on the landscape, seasons, in a cyclical manner, as opposed to the linear representation of the Gregorian calendar. It depicts 17 months captured within a total of 6 seasons. It shows the changes in temperature at different elevations. With the colder temperatures the months refer to changes on the landscape as they are occurring at lower elevations. When the temperature warms, the months refer to changes occurring on the landscape in higher elevations. This captures movement on the landscape, as landscape features change, so too do Nimíipuu practices as they are informed and structured by the *nimíipuum inmiiwit*.

The Nimíipuu seasonal round conveys landscape changes through the seasons to inform Nez Perce tribal membership's knowledge and practices. The following excerpt describes how the seasonal round expresses Nimíipuu knowledge about the land and how this cycle structures Nimíipuu movement on the landscape. This tribal collaborator explains,

> Our months are named after what's going on and what's ready or what it should be doing. I started bringing some of the roots we gather to the school and showing them pictures and we are doing the calendar. We were starting with *qa qiťál*, is April, *qeqít,* the potato was just coming out. When we are teaching these kids *qaqqiťál*, oh that means April, well it really doesn't mean April… then you had *apaál*, May, so they need to know what *ápa* is, so I brought my little jar of *cous* and we tried it and this is what it looks like. Here's the plant, I showed them a picture, we even had some wild celery that we pressed, we laminated it so that they can see that and that grows everywhere. That is also another indicator that the other plants are going to be coming out soon. So over our months they describe what you should be doing…It goes on through, *qaqqiťál*, *apaál*, you are making your *ápa* because the *cous* is ready. Then *tustumasáťal*, that would be June next, *tustumasáťal*, there is actually a month in between that is called *isĺáĺ*, so we have these in-between months. So, *isĺáĺ* is our time of month of melting snow in the mountains. Then June comes, *tustumasáťal*, *tústi* means you go up, so the snow melts and you go up there. What's *tustumasáťal*, *tús,* when the snow melts, what's going to be there, all the new plants are going to be there. So, you can start heading up there. Then *Tay'áal* that's the time of the blueback that's self-explanatory, those fish are coming. So, you should start hitting your rivers and you have *Waw'amaayq'áal* when you hit the

> headwaters those fish around August are going to be hitting their spawning grounds so you can see, following the fish, the word describing where the fish are going to be or what's going on at that time. And then *Pik'unmaayq'áal*, the fall run is going to start so you are back to the Big River [Columbia River] (Nez Perce tribal member, Thomas Tátlo Gregory, 2013).

As this tribal member illustrates, each season name is embedded with Nimíipuu place-based knowledge that is specific to a particular plant, animal, fish, or change on the landscape. As such, these season names are imbued with praxis in that they tell "what you should be doing". For example, *qaqqiťál*, is not an arbitrary label for the word April, it stems from the root word *qeqít,* the potato, which is available for gathering during this time of season in certain ecosystems in Idaho. The Nimíipuu seasonal round and season names illustrate the expansiveness of Nimíipuu knowledge and movement. For example, *isĺáĺ*, a Nimíipuu season, conveys snow is melting in higher elevations and the following season *tustumasát'al*, *tústi*, "means you go up," so Nimíipuu know they can begin to move upward in elevation (See Figure 4).

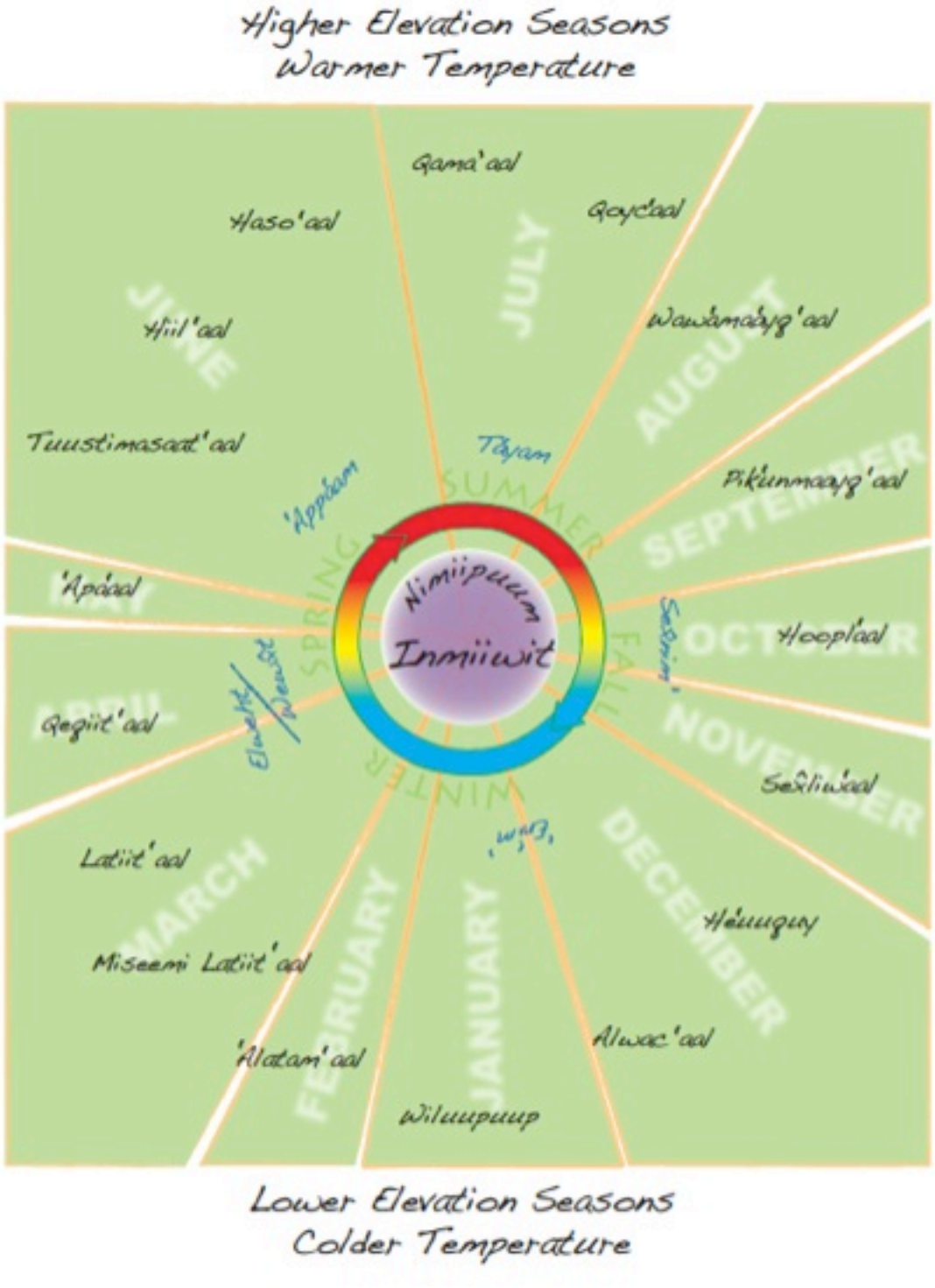

Figure. 4. *Nimíipuum inmiiwit*, Nez Perce seasonal round, developed by tribal members Anthony Smith and Josiah Pinkham.

The seasonal round, as it represents and encourages movement on the landscape, enables a connection between Nimíipuu people and the landscape. This relationship built on expansive knowledge, experiences, and movement enables opportunities for Nimíipuu people to learn from the landscape. The following tribal collaborator explains how fishing in different locations, afforded a learning opportunity for him taught by salmon,

> That's where it started was the river you know and the first thing you were taught was to respect the river. That's primarily because of the danger and later on you start to develop an appreciation for it and that it will feed you and take care of you and what ties into that is the water. You have to have clean water. Water is medicine for everything. It takes care of everything, Everything needs it… All these little cricks and stuff, and you imagine all the different fish that were particular and were born in that crick just like all the different bands of Nez Perce that use to be everywhere around here. Now it's just a few. The fish are the same way. Just a few main runs, just a few. We are all kind of one group of people now. We got some communities up river and stuff. I mean there were hundreds of bands around here. Just think of all the different fish. You start going to new places. I can remember Rapid River one year. The run didn't seem that strong… Everyone was gathered up at the mouth catching them there. I wanted a change of scenery so we went to Looking Glass Creek. That was really fun for me. Using the spear is my favorite way to fish. It was perfect for that. It was just beautiful out there and those fish look different, acted different. That's what really made me think about it, the diversity in these fish, they are all Chinook, so really that hit me. That hit home pretty hard, man, we are just like the salmon…Our seasonal round has everything to do with the environment (Nez Perce tribal member, Thomas Tátlo Gregory, 2013).

The seasonal round both represents and encourages movement. Such movement, for this tribal member led to the development of a closer connection between himself and Chinook. The exertion of treaty rights, in fishing at "usual and accustomed" places, affords a learning opportunity, strengthening one's relationship with the landscape. Fishing in different tributaries, for this tribal collaborator strengthened his identification with salmon and enabled him to see parallels between salmon and Nimíipuu peoples' diversity, expansiveness, and plight. Both salmon and the Nimíipuu have endured and persevered through the negative impacts on the landscape. Examples, such as these were numerous among Nimíipuu collaborators; as they described how they are just like salmon and wolves, situating themselves equally, *relationally* and strengthening their connection to one another.

Figure. 5. Nez Perce tribal members and friends fishing for salmon in Lake Creek near Burgdorf, Idaho.

When treaty rights activities are guided by the structures, *tamálwit* and the *nimíipuum inmiiwit*, places are accessed in a different way than many other land users. The seasonal round structure has implications for environmental management. This makes environmental management positions difficult when mangers don't understand the way in which Nimíipuu tribal membership accesses the land. Environmental management infrastructures standardized within federal agencies to accommodate nationwide objectives and established by State management to regulate non-tribal land user activities pose barriers to Nimíipuu knowledge of, access, and exertion of treaty rights activities. Such external environmental management structures often do not support Nimíipuu forms of movement on the landscape as informed by *nimíipuum inmiiwit*.

Seasons for activities like hunting and gathering are different than non-native land users whose activities are predicated on State and Federal regulations. Road and campground closures may be implemented in consideration of State fishing and hunt

seasons, but these same State and Federal practices can pose barriers to tribal members who access these locations in a different manner and on a different time-frame. The following tribal collaborator describes these concerns in more detail,

> The agencies need to understand *what is access*…The movements of Nez Perce, although technology has changed in the way in which we access those things has quickened, the way in which we use those resources hasn't and the values by which we have used them haven't changed all that much. That is what is different about the way that the Forest Service uses the resources and the general public. I think the general public has this notion of recreation on the forefront, whereas tribal members are out there under a different kind of a connection to those resources. On one hand for the general public, recreation carries with it this optional mentality or its something we are doing out there for fun because its something we choose to do. On the other hand, tribal members are going out there because they have been connected to those resources for many, many generations. For thousands of generations we've gone to particular places and we still do such. The other thing is that the general public and the Forest Service, now this is really, really important to understand, they think that what the Nez Perce are doing is traveling from the reservation, or wherever their home might be on or off the reservation, to a point, using resources, and then coming back. That is a pretty gross assumption because what that entails is we are not utilizing anything between those two points and we are not going anywhere beyond that point. In all actually what the tribal membership…really what they are doing is like a web that breaths, it goes back and forth. There is a constant flow of tribal membership out to these places and back, but along the way they might stop part way and go somewhere else. They might go out with the intention of getting wood and come back with an elk. All of these things are in constant flux. When it comes to things like hunting they're not going out there and hunting that location. What they are doing is they're hunting along the way and if they see something they take it where it shows itself. Hunting locations are something that are really, really liquid. The same with gathering firewood. We are going out there and looking for the trees that we want and we know certain locations are proven, but if something presents an opportunity we are going to jump on it. That is something the Forest Service has an assumption on (Nez Perce tribal member B, 2013).

As this tribal collaborator explains, tribal movement on the landscape occurs in a different manner than that of many other land users. Practices on the landscape are influenced by structures like *tamálwit* and the *nimíipuum inmiiwit* as opposed to State hunting seasons. In addition, planned activities are flexible enough to draw on different opportunities provided by the landscape; tribal membership may go out with the intention of hunting, but may not

ever reach their destination and may come home with a truck full of firewood instead. As one tribal collaborator explained it to me, what happens out on the landscape is dependent on the Nimíipuu-landscape *relationality*, what ever gifts are offered are the gifts brought home regardless of one's intentions when leaving the driveway.

In understanding Nez Perce tribal membership *relationality* to the landscape through structures like *tamálwit* and *nimíipuum inmiiwit*, environmental managers can become aware of the principles imbued in practices. An awareness of such structures informs environmental managers approaches to tribal collaborations and consultations.
In addition, this awareness can inform management practices, so to avoid the posing of any unnecessary barriers. For example, as *tamálwit* and *nimíipuum inmiiwit*, not State regulations inform treaty rights activities, the seasonality and timing of which may contrast with other land users. The following tribal collaborator describes the hindrance of closures, stating,

> I think access has always been a big thing, you know, trying to go gather something up in the mountains when gates are locked or roads are closed, or something, you know, if roads are closed and the place is somewhat closer, close by, you know people can walk in, but you know roads being closed for elderly people is really difficult because they can't walk so far (Nez Perce tribal member, Arthur Taylor, 2013).

Federal environmental management agencies like the Forest Service may not know how closing campgrounds and Forest Service system roads effect tribal treaty rights. Through environmental managers' awareness of *tamálwit* and *nimíipuum inmiiwit* and with the help of collaboration with the Tribe, land managers can accommodate Nimíipuu practices on the landscape. Such strategies may eliminate some negative impacts to treaty rights activities as indigenous communities' interactions and movement become apparent to environmental managers.

ii) *Tamálwit*

Tamálwit is a central concept encompassing the principles telling of Nimíipuu relationships with the landscape. This concept as defined in the Nez Perce Dictionary is a law, ordinance, commandment, constitution, and government (Aoki, 1994). Expanding beyond this definition, *tamálwit* is described as a set of ethical principles, or a moral philosophy, that guides Nimíipuu interactions with the world. *Tamálwit* situates participants within the landscape, provides connection with all beings in the landscape, and has ethical

implications for the types of interactions participants should have with those and that which surrounds them.

Principles of *tamálwit* inform various components of Nimíipuu life. The knowledge contained in these principles guide various types of Nimíipuu practices such as hunting, gathering, and kinship. *Tamálwit* contributes to the structuring of practices, like knowing when to fish. In the following, a tribal collaborator explains how *tamálwit* informs Nimíipuu-landscape relations,

> In a ceremonial sense, its [*tamálwit*] our law that we live by, all that makes us who we are… it can spread out to a whole lot of different things, in terms of again, how we relate to the land, and even really simple, basic things of knowing particular types of medicines, knowing particular types, or places to go for medicines, the right times of year, all the things that go into maintaining that connection to, to the land. Fishing, hunting, the proper times, all that is not something that we make, and that's why, part of the reason we aren't in tune with, like, making hunting seasons, or fishing seasons, and stuff, because sometimes our view of the proper time to hunt fish is different than, like say the State's version, or even another Tribe's version. So that all guides, its supposed to, those laws are supposed to guide us on this land, and they're pretty dynamic, some people may have, some families may have more knowledge concerning one particular aspect, you know, but collectively, that's what makes up being Nez Perce, is that understanding. And then it goes to like, you know, just basic stuff, laws that we have as far as families and how we relate to one another, and how we draw kinship to one another, and things like that, so it just covers everything (Nez Perce tribal member A, 2013).

As this tribal member describes *tamálwit*, the word refers to all that provides guidance on how to relate with the landscape. Embedded in this concept is specific knowledge about the landscape and principles that concern how to interact with features on the landscape. Interactions include those within the community such as friends and family, but also interactions with plants, animals, and fish among other features. *Tamálwit*, not State regulations, is used to help guide these practices, like the treaty rights activities of hunting for salmon or deer.

As the above tribal member pointed out, different families within the Nimíipuu community hold varying degrees of knowledge concerning *tamálwit*. With changes in the landscape Nimíipuu relationships with their surroundings are altered. The following tribal collaborator describes how landscape changes support or weaken Nimíipuu peoples'

knowledge of and guidance by *tamálwit*, effecting relationships with the landscape and community,

> Humans kind of veered off of what we call the *tamálwit***,** our laws that our people had that all people had, plant people, animal people, all those things that lived on this land they follow a specific law and that is what our traditions or what you call "culture" now is based off of laws and how we interact with things. And it is the same thing, of course we have veered off of that in a lot of different ways for different reasons, but those animals never veered away from that base. They have had to adapt in certain instances but they still maintain those original beliefs. That is why they are a learning tool to us because it helps us get back to that way of interacting with the world and that type of understanding that people just don't have no more and they are losing more and more all over the world. You loose that opportunity when you don't have one of those types of animals [wolves] around (Nez Perce tribal member A, 2009).

As this tribal member describes, *tamálwit* informs relationships with the world; changes on the landscape, here given in terms of species presence, have impacted the transmission of *tamálwit* and therefore guidance on communities' relationships with the landscape. Other beings, like wolves, on the landscape still live by these original beliefs; because of this, wolves are learning tools for strengthen one's connection to the landscape through *tamálwit*.

Principles of *tamálwit* inform tribal collaborators' views of wolves, which motivated the Nez Perce Tribe's efforts in Idaho gray wolf reintroduction. Nimíipuu interactions with wolves guided *by tamá*lwit, teach tribal collaborators the important role wolves play in the ecosystem and within the landscape. *Tamálwit* teaches everything has a right to exist and serves an important role. Such principles contribute to a Nimíipuu view of equality, whereby species are identified with and motivate tribal involvement in their restoration. The role of wolves was extended with their reintroduction, as they enabled the Nez Perce Tribe's assertion of tribal sovereignty. The following tribal collaborator describes the importance of these principles, how they conflict with other factions in the general public, and how they inform the Nez Perce Tribe's environmental management practices. As the tribal elder explains,

> See we view it [wolf reintroduction] as restoring a species, other people thought, oh its evil, they're gonna start killing our cows, or horses, and killing elk, you know, young fawns, and they are here to destroy. Well no, we don't see it that way… What it used to be is everybody had their place on this earth, whether they're insects, birds, fish, or animal. So why should we try

> and wipe them out. You know, it is not our purpose to wipe out any species…Everybody has the right to exist on this earth, no matter what species… We're trying to do it in our small way by restoring salmon, and restoring *qémes,* and restoring other species, or trying to attempt to make the homeland for all these other species acceptable so that they can live their lives the way they want to…Just like the reintroduction of the wolf, he's part of the ecosystem, so why should he be excluded?
> (Nez Perce tribal elder C, 2013).

This tribal elder describes principles of *tamálwit* as they relate to guidance on how to interact with other species. As explained, all species have a right to exist and have a role to play; to impose a will on these species toward their destruction would be to disregard their right to "live their lives the way they want to." The Nez Perce Tribe, as this elder describes, sees their environmental management role as assisting the maintenance of this *tamálwit* principle through species restoration.

This *tamálwit* principle is described further as the following tribal collaborator articulates, wolves both teach *tamálwit* and provide an opportunity to exhibit your understanding of *tamálwit* through supporting their presence. Wolves exhibit pack dynamics akin to Nimíipuu social dynamics. Such exhibitions teach equality among the Nimíipuu community and between the Nimíipuu and the landscape. She explains,

> When I think of the wolf and how their dynamics are and their family and all of that and when you learn about the wolf, that is exactly how the Nez Perce people are. When you think of how they have their hierarchy and survive, and it really is based on survival, but you know it's almost like the value of each role. That's how the Nez Perce traditionally have been. We struggle today with male and female roles, but there was a time that Nez Perce didn't struggle with those things. There may have been an alpha, there may have been a chief, but that was, even though that was highly revered, that was not more important than the young child. Everybody's role was highly respected. There was a reason you had your role and they were all really respected. We learn those things in our traditional way and in our longhouse teaching. Because we've had such outside influence of missionaries, we've lost a lot of values that the wolf can re-teach us, the roles of everybody (Nez Perce tribal member, Rebecca Miles, 2013).

As this tribal collaborator explains prior to the influences of missionaries, Nimíipuu people upheld a principle based on all beings having an important role. With the reintroduction of wolves, such species provide the opportunity for the Nimíipuu people to reconnect with this *tamálwit* principle.

These principles are reinforced by the living landscape, such as wolves, but also in places that signify the occurrence of creation stories. At a location near the Clearwater River, marked by many large stones, is the setting of a Nimíipuu oral tradition that tells about the coming of the Nimíipuu. The story as told to me, explains how the Nimíipuu will come and need help from those on the landscape in order to survive. The Creator asked who would give to the coming people, salmon, one of many to make sacrifices, offered his whole body. *Tamálwit* is embedded in this oral tradition, as those on the landscape give, sometimes their whole bodies, for the Nimíipuu peoples' right to exist. In turn the Nimíipuu people's role is to reciprocate this giving and give to those on the landscape whose right to exist is threatened. *Tamálwit* motivates the Tribe's environmental management philosophy. The Natural Resource department enabled grey wolf reintroduction, supporting their right to exist, in offering to be the in-state managers when State agencies refused (Cortes-Vazques & Zedalis, 2013). The Fisheries Department objectives, support anadromous fish right to exist, with the Tribe's restoration projects in the Snake River Basin.

Tribal collaborators describe *tamálwit* informs the Tribe's environmental management philosophy to support species' right to exist; this is a reciprocity based on the Nimíipuu concept of *téke*. *Téke*, a Nimíipuu concept to give or share food in its literal definition (Aoki, 1994), is a *tamálwit* principle that further guides Nimíipuu interactions with the world. *Téke* addresses the ethical responsibilities and importance of reciprocity one has to their relations. A tribal member below describes this principle as the following,

> It's basically interpreted as law, but the other part of it is that *tamálwit* is like a spiritual law that we believe we are under. What you give to something is what you basically get back (Nez Perce tribal member B, 2013).

As this tribal collaborator states, *tamálwit* involves guiding interactions under an ethical responsibility. These interactions are built on an agreement, that what you give you receive in kind, allowing one another to exist under the same rights, a reciprocity. The giving or sharing of food, as illustrated in the above oral tradition, is more; it is an act of sacrifice and an act of reciprocity. For salmon to provide himself/herself as food this offer must be reciprocated to continue such a cycle, the Nimíipuu must give to salmon sustainability of his habitat for the exchange to continue to occur. Such an understanding of reciprocity is *téke.* The following tribal collaborator illustrates the principle behind *téke* further by stating,

> A huckleberry is a traditional food, a spiritual food. It has its own feast. So it's like you're just telling the huckleberry, get into my bucket right now kind of thing, when you're suppose to have a feast to be able to go pick with them. You just don't go out to the forest because there's a huckleberry bush and pick all the berries off it. You leave berries, it's a teaching… you pick some of the berries here, and you leave the rest. You know, because you want the fauna to rejuvenate and to enjoy its life (Nez Perce tribal member, Arthur Taylor, 2013).

As this tribal collaborator explains, for the Nimíipuu, interactions with the world are built on *téke*, as part of *tamálwit* law, to give as you receive. As huckleberries provide food, the Nimíipuu have a reciprocity responsibility. This is translated through the practice of having a huckleberry feast, honoring the plants sacrifice, and leaving berries behind. The latter, exhibits a giving as received, leaving berries behind for the plants' sustainability. The huckleberry patch can grow in size with the berry seeds left behind and the bears' and birds' consumption of the berries supports gene flow and genetic variation.

Tamálwit's guidance through the concept of *téke* supports a reciprocity expressed in Nimíipuu tribal members' practices, but also in the Tribe's environmental management philosophy. The following tribal collaborator describes this reciprocity as part of a cycle. She explains,

> What I see from my perspective is that we are always being taken care of as long as we are taking care of all of those resources that are provided to us; and so to me that's what that full circle means is that we will be healthy as long as we maintain our environment and it's sustained. I think that captures everything of what we do as a Tribe in putting all of our time, energy and resources into all of our resources and trying to sustain them; the fish, our game, our hunting, our traditional gathering, where we do a lot of our picking and digging (Nez Perce tribal member, Yolanda Bisbee, 2013).

In her statement, this tribal collaborator describes *téke*, an ethic of reciprocity, as expressed in the metaphor of a full circle. As she explains, the Nimíipuu people's health is connected to the health of the landscape. For the Nimíipuu community's health to be supported they must sustain the health of the environment.

This reciprocity, as described by the above tribal collaborator as part of a full circle, was expressed in many ways by all tribal collaborators. For one tribal member it was exemplified in the Nimíipuu being a part of the ecosystem and not separate from it (Nez

Perce tribal member D, 2013). For a tribal elder, it was expressed as the earth being a part of your body. He explains,

> If you consider yourself a part of the earth, then that is the way you should treat the earth, you know, as part of your body. And like what's happening, is like, you know, the Passenger Pigeon was eradicated, there's no more Passenger Pigeon. Well, if you consider the Passenger Pigeon as part of your hand, like a finger, and maybe the buffalo another portion of your hand, another finger, and maybe the Sockeye salmon comes further up your arm, then you've lost this body part. When will you say, no, I will not lose any more body parts. That's what you should be saying. If you consider yourself part of the earth, and all of us species that grow on the earth, then you are part of that, so if you start to eradicate species you're destroying your own body (Nez Perce tribal elder C, 2013).

As this tribal elder explains, if losing a species was viewed akin to losing a part of your body, it would entail different approaches to life, having implications on environmental management.

Figure 3 is an art piece by tribal member Sarah Penney that is a visual representation of this connectivity with the landscape. During an interview, a tribal collaborator referenced this art piece, stating that it exemplifies, "we are the same in that we come from the earth. We respect the earth as our body" (Nez Perce tribal member, Angel Sobotta, 2013). This piece depicts landscapes like those that surround Lapwai, Idaho, the seat of the Nez Perce government. Illustrated are the rolling hills, blooming *qémes*, and butterflies characteristic of the landscape near Lapwai. Lapwai, derives from the Nimíipuu word, *łéepłepwey* referring to the Creek near the town. *Łéepłep* is Nimíipuu for butterfly, a characteristic feature of the Lapwai area and important symbol for the Nimíipuu. This piece embodies many important aspects of Nimíipuu identity.

Figure. 6. Art piece by tribal member Sarah Penney. Source: Sarah Penney, (2013).

c) Education

Tribal collaborators all highlighted the importance of education for maintaining treaty rights and continuing collaboration and consultation with external environmental managers. To maintain the ground gained for Nez Perce treaty rights, tribal membership and younger generations need to be educated. In terms of educating the external public and environmental managers, many tribal collaborators viewed education as a double-edged sword, as what members of the public and environmental managers do with the knowledge that the Tribe shared is hard to control. Threats to the integrity of IK and to the landscape, be it a *qémes* prairie or a sacred place, are also major concerns for tribal collaborators when considering the sharing of knowledge. Maintaining access to locations and to features within the landscape is also continuously threatened by environmental management and by other land users. As the following section explores, education has the potential to both increase and decrease these threats.

Continuing the battle over external environmental managements' support for treaty rights involves education of tribal membership for the generations to come. Education of

tribal membership on treaty rights is important for consist and continued assertion of such rights. As the following tribal collaborator points out,

> When we don't fully understand or practice them [treaty rights] then that becomes a barrier because then our kids follow our same footsteps and then we can't access that (Nez Perce tribal member, Angel Sobotta, 2013).

As this tribal collaborator explains, the understanding and practicing of treaty rights by tribal members is necessary if these rights are to be retained. For tribal membership, education strategies will inform new generations as they are exposed to the challenges of maintaining their Nimíipuu-landscape *relationality*.

In addition to education for tribal membership, external environmental managers must continue to be educated on tribal treaty rights. This is a constant struggle, as agencies tend to have high turnover due to promotions and seasonal positions. A tribal collaborator below suggests signs posted at entry stations may be a remedy,

> For instance Yellowstone National Park for years we would go in there and pay, we didn't know. But that is our *usual and accustomed places*. When we go there we show them our tribal id. To make sure that those people are educated, every single one should be educated. They should have a sign and within their training and always have a sign in case they forget. We retain that right. And to inform so that people, where we retain those rights it is so important to continue to use those areas, so that they don't forget our presence (Nez Perce tribal member, Angel Sobotta, 2013).

As this tribal member explains, measures, such as the posting of signs that educate on treaty rights could alleviate some of the organizational and logistical barriers of maintaining education. These measures, implemented at locations such as Yellowstone National Park, informs tribal members, seasonal employees, and the general public of tribal treaty rights and how they might be honored by environmental management entities. Such a strategy contributes to a further awareness of these landscapes as being a part of ancestral territories where tribal relationships with these landscapes are still actively maintained.

In addition to strategies involving sign posting, the following tribal elder suggests that workshops, seminars, and presentations should be done with external agencies on a frequency of every two years. He explains education has its challenges because,

> Well, there's always a turn-over with Forest Service personnel; they transfer out, so its a continual educational process, really. So having seminars, workshops, and information exchange probably is the best thing to do. And I

> found out that was true, too. Every two years or so the Forest supervisor would change, so I'd have to go re-educate a new Forest Supervisor (Nez Perce tribal elder C, 2013).

For the Nez Perce Tribe to continue gaining ground over the assertion and maintenance of their treaty rights, education strategies need to be implemented.

Treaty rights can be impacted in multiple ways, from broad policy decisions to how an individual agency employee reacts to a tribal member's fishing without a State license. Therefore, for environmental managers, education on treaty rights needs to be done throughout management levels, educating both those who make management decisions and those who engage with tribal members on the landscape. In addition to more signage and workshops, academic or other formal training for federal and state natural resource managers and scientists on treaty rights, Native American communities and perspectives could help alleviate issues pertaining to educating throughout management levels. Universities and professional organizations such as the Society of American Foresters, wildlife Society, and American Fisheries Society could make this knowledge and awareness part of their accreditation process. The mandating of such training would assist in improved collaborative efforts among Native American communities and external environmental managers.

Although environmental managers' education of tribal treaty rights can alleviate challenges, it can also pose new challenges. Many tribal collaborators discussed concerns over educating external groups because once knowledge is shared control over its dissemination and how it is disseminated is limited. Concerns regard both keeping the integrity of IK intact and maintaining the integrity of a landscape and one's relationship to it after knowledge exposing those locations has been shared. When IK is shared often times the principles or teachings behind that knowledge are not transmitted. This incomplete transmission results in a corrupted and superficial representation of some views, which can have harmful consequences. More importantly, however, a partial transmission is seen as a disservice to the information itself, and thus unacceptable. A tribal collaborator describes the problem of superficial knowledge through a distinction between teaching culture, but not teaching culturally. He uses the following fry bread metaphor to describe this,

> If you take them and show them a picture of a piece of fry bread, and you tell them, here's the Nez Perce culture. I said, that's showing them a piece of fry

> bread, but I said it doesn't give them why the Nez Perce make fry bread, why we eat it, how it's made, what's the ingredients in there, how it's handed down from mother to daughter, and even to men, and I said you're not teaching them any culture behind why that's fry bread, your just showing them, there's fry bread, and saying that's the Nez Perce culture; and I said, so what you need to do is you need to teach all that that's behind it; that everything that led up to that piece of fry bread (Nez Perce tribal member, Bill Picard, 2013).

As this tribal collaborator explains, teaching culture alone, does not address the principles or teachings behind a community's culture. Educating environmental managers on Nimíipuu IK must entail both the knowledge itself, but also the principles behind it. For instance, as illustrated, treaty rights are a means through which the Nimíipuu maintain their *relationality* with the landscape. Such strategies for educating IK, contextualizes this knowledge, illustrating how it is community specific and place based, in doing such environmental managers can assist maintaining the integrity of such knowledge.

In addition to maintaining the integrity of IK with the education of indigenous communities' knowledge, maintaining the protection of places and landscapes are also of great importance. As many tribal collaborators discussed, sharing information about fishing, hunting, gathering, and other significant locations to those outside of the community has resulted in the exploitation of those landscapes. The following passage from a tribal collaborator describes this concern further as he was taught to be careful with sharing knowledge at a young age,

> Nez Perce do not talk about all the things they gather, medicines, and different things, and so they don't want to talk about why they are going there. My mom would say, you know, when we were digging something, and she would say, and tell us in Nez Perce to like, dummy up; oh, we're just playing around kind of a thing, you know, people driving through always want to stop, and wonder why, I wonder what they are doing up there...Don't say a word about what we're doing, just make something up. And those kinds of things, just because that information is sacred and we didn't want people to know what exactly we we're doing there… forest service people know, oh, they might, this is an area where they traditionally come (Nez Perce tribal member, Arthur Taylor, 2013).

As this tribal collaborator illustrates, the integrity of both knowledge and of place locations needs to be maintained. Sharing knowledge and educating outside of community places both this knowledge and landscapes at risk of misunderstanding and corruption.

If education measures are to be implemented into environmental management and through formal training it is important for managers and curriculum designers to collaborate with tribal partners on what knowledge is disseminated, how it is disseminated, and to whom. Through this collaborative process measures can be put into place to reduce the risk of negatively impacting the integrity of IK and the landscapes it concerns. With these considerations in mind, education of external environmental managers has the potential to alleviate misunderstandings regarding treaty rights, Native American communities' practices, and relationships with the landscape. Such thoughtful efforts in education can also led to the building of trust and the strengthening of collaborative processes.

4) Conclusion

If environmental managers are to understand the positions of their indigenous collaborators it is important for them to know how these communities conceptualize, perceive, and articulate such perspectives themselves. Nez Perce collaborators regularly expressed these perspectives through the key themes of treaty rights, *nimíipuum inmiiwit*, the seasonal round, *tamálwit,* and a cautious consideration of the potential role education can have in enabling the actualization of the values related to these themes. As a part of this endeavor this chapter provides the perspectives of tribal collaborators by using block quotes. The findings of this chapter describe the importance of and barriers to treaty rights, Nimíipuu structures that inform their relationships with the landscape, and issues related to education that can inform both tribal and external agencies environmental management practices.

Major environmental management barriers, products of Native American and U.S. government relations, to maintaining Nimíipuu *relationality* with the landscape involve the defining, assertion, and education of treaty rights. Major themes regarding Nimíipuu relationships with the environment and land management involved the roles of *nimíipuum inmiiwit*, the seasonal round and *tamálwit*, a law or set of principles that guide interactions with the world. Principles of these community structures situate the Nimíipuu relationally as a part of the environment to inform experiences and values as they are played out on the landscape. Major barriers relate to treaty rights and concern issues facing the possibility of outreach and education regarding such rights between the Tribe and other external agencies.

This education needs to be conducted throughout the levels, from the supervisor level to the seasonal employees that tribal members encounter on the landscape. Education through the levels is not an easy task; agencies often have a high turnover, which simultaneously adds to the necessity and the difficulty of renewing education. However, academic and formal training in Native American treaty rights, communities, and perspectives could alleviate the logistics of educating federal and state environmental management employees. Other themes relating to education highlight the importance of tribal membership education for treaty rights and access to "usual and accustomed" places to be maintained.

As illustrated, Nimíipuu collaborators rely on different structures to inform their relationships with the landscape and their resultant views toward both the practice of management, and their relationship to other management agencies. External managers' knowledge of these structures can be used to inform their management practices. Such an awareness can influence the closure of system roads, campgrounds, and promote education, all which would support treaty rights activities and access. Ultimately, the collaboration between external environmental managers and tribal managers will entail some level of education and mutual respect for each other's epistemologies, in addition to a level of trust in the other to ensure the exchange of such knowledge will not result in a loss of its integrity. Such a level of trust would be predicated on mutual develop and understanding of a sense of *relationality* and *reciprocity* between collaborators. As a result of these findings, this chapter concludes that an awareness of Nimíipuu *relationality*, *reciprocity*, and the Tribe's environmental management approaches can contribute to improved Nez Perce Tribe and external environmental managers collaborative and consultation efforts.

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Chapter 4: Conclusion

Environmental management agencies are increasingly exploring the roles indigenous communities and their knowledge play in addressing ecological and land use issues. As a result, consultations and collaborations with indigenous communities are being mandated in the United States and Canada for federal land management entities. As part of these initiatives, researchers and scientists categorize indigenous communities' knowledge as traditional ecological knowledge (TEK) or indigenous knowledge (IK) and explore how such knowledge can be integrated into management systems. TEK is a broader notion inclusive of any communities' knowledge about the environment that is derived from their experiences and traditions; IK is that knowledge associated specifically with indigenous communities. Consistent with integration efforts, adaptive collaborative management (ACM) researchers, among others, point out that indigenous communities and their IK are especially useful for environmental assessments and informing managers on baseline conditions for ecological health. In addition, ACM researchers point out the benefits of having managers understand the informal practices of indigenous communities, like social sanctions, that both support and regulate a community's land use practices.

Despite the potential benefits, some critics of IK integration into environmental management argue that existing external institutions and structures decontextualize such knowledge. As a result, these critics argue that the integrity of IK is lost when translated into these structures. A second problem is that environmental managers often establish a degree to which they are willing to accept IK. If the information indigenous communities provide contradicts with environmental managers assessments then IK and the epistemic positions of indigenous communities are often undervalued. Political and historical occurrences also place added pressure and challenges to IK integration into environmental management. Such factors pose barriers and challenges to collaboration between environmental managers and indigenous communities.

To explore such issues involving IK and its integration into environmental management, this dissertation looks specifically at the Nez Perce Tribe and its enrollees, the Nimíipuu community, and their relationships with both the landscape and external environmental managers such as the United States Forest Service and the Idaho Department

of Fish and Game. Throughout the exploration of this research topic, we find illustrations of the contributions indigenist theory can make to understanding IK. Such understandings, as explored through this research process, contribute to conceptualizing IK within both research methodology and environmental management contexts.

This dissertation contributes to developing a more robust interpretation of IK and argues, through exemplification of Nimíipuu IK, that conceptualizations of IK need to be both community-specific and place-based. As represented in the natural resource management literature, IK is a knowledge-practice-belief system that is diachronic and rooted in local ecological systems. Through a synthesis of indigenist theory and in exploring Nimíipuu conceptualizations of their knowledge, I offer an expansive discussion on the notion of IK than that presented within natural resource management literature. Described in this dissertation were several major ontological, epistemological, and axiological principles often presented in communities' IK.

The ontological claims relating to indigenous principles made in this dissertation include understanding reality as a serious of subjective relationships among all in creation. This entails a second claim: humans are embedded within the ecological context and not extracted from, not even during research practices. Epistemological claims articulated in this dissertation center around the notion of a *coming to know* process in which humans learn through their subjective relationship with the world. Views concerning how to *come to know* reality entail an axiological responsibility of *reciprocity* to that which is attempting to be known. For example, in order to *come to know* the nature of salmon one must also know the sacrifice salmon makes to help sustain humans. Understanding such and viewing salmon as equals is a form of the reciprocity necessary for *coming to know* the world. Argued here, more than a knowledge-practice-belief system, IK is rooted in community-specific and place-based expressions of a *relationality* and *reciprocity* to the landscape.

In looking at IK integration efforts through case studies, this dissertation argues that not only IK content, but also ontological, epistemological, and axiological principles of specific indigenous communities need to be understood to contextualize IK. These principles need to be understood in order to gain an understanding of these communities' practices as they are embedded within the landscape. Such an argument was exemplified throughout the research findings, by describing Nimíipuu-landscape co-dependency between

qémes, Camassia quamash, and the Nimíipuu community and the principles that guide this co-dependency. These principles are taught through community-specific structures, such as the Nimíipuu structures of *tamálwit* and the *nimíipuum inmiiwit*, seasonal round. Because improper IK integration can entail a decontextualization of IK and its transmission, I argue for a knowledge co-generation process in both research and environmental management approaches. Rather than approaching IK's application within environmental management through an integration process, managers should use such a process. A knowledge co-generation process, through self-location and social networking efforts, creates an awareness of the bias, assumptions, and worldviews that inform knowledge of and relationships with collaborators and the landscape for managers, researchers, and indigenous communities. Nimíipuu expressions of *relationality* and *reciprocity* inform views toward the landscape and those that manage it. Through *relationality* and *reciprocity* among collaborators mutual respect and trust can be built to enable a collective decision making process.

In addition to managers' understanding of community-specific and place-based structures, using indigenist theory, ACM examples, and Nimíipuu experiences, I argue that environmental managers need to understand the political and historical factors that influence IK integration and collaborative efforts. The political and historical events that impact IK integration for Nimíipuu collaborators involved tribal sovereignty, specifically, treaty rights and treaty rights education. As a result of these findings, this dissertation encourages both researchers and environmental managers working with indigenous communities to become aware of the structures that inform indigenous communities' relationships. Such awareness is facilitated by knowledge co-generation, whether it is to create a research methodology as exemplified by the research approach presented here or to create a management project or problem solving for a management barrier or challenge. To support an awareness and co-generation process, relationships need to be built among collaborators. Such relationships will help facilitate the transmission of knowledge in a manner in which the dissemination does not threaten the integrity of IK, the community, or features within the landscape.

As human demands continue to add pressure to ecological systems, an awareness and understanding of indigenous community practices and knowledge may offer potential strategies that society can adopt. In order for the potential benefits of IK use in environmental management to be developed further, more research needs to be done

articulating and exemplifying a knowledge co-generation process within multiple contexts. Such research would contribute to understanding the adoption of such measures while maintaining an environmental management context that is community-specific and place-based. Further research also needs to be done by combining indigenist theory with environmental and land management issues in order to continue contributions toward a robust understanding of indigenous communities' IK. Such research can assist notions of TEK and IK so that their integration is inclusive of the principles and structures that are supported by indigenous communities. In addition, researchers can contribute to further arguments that encourage environmental managers' collaboration with indigenous communities and support for tribal sovereignty, illustrating how such collaboration will help support environmental management objectives.

Agencies' adoption of such an awareness and approaches can be paralleled with the efforts made by those in integrating an ecosystem level approach to management. Connectivity within the landscape is widely accepted and understood by scientists and mangers contemporarily. Similarly, by taking an expanded approach to understanding IK and indigenous peoples' *relationality* with the landscape, we are advocating for that sense of connectivity to be pushed further, in such a way that situates humans as a part of ecological systems and not extracted from them. In order to further understand humans as situated components within these dynamic systems, research needs to continue to understand and address human-landscape interactions and co-dependency at various levels.

Just as we are beginning to understand how wolves impact riparian health, we need to understand wolves' impact on the Nimíipuu community and in turn the community's continued impact on wolves. In understanding the dynamic components of this integrated system, we can begin to appreciate how the Nez Perce Tribe's support for wolf reintroduction trickled down to influence riparian health. The embedded roles humans have within these complex ecological systems needs to be met with further awareness and understanding among environmental agencies. Educating agencies of such needs to be emphasized by researchers working with indigenous communities. For my own work this will involve facilitating awareness through collaboratively generated workshops, field visits, and presentations with Nez Perce tribal members and Payette National Forest managers.

Appendix A

Institutional Review Board Approval

University of Idaho

Office of Research Assurances
Institutional Review Board
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July 18, 2012

To: Sanyal, Nick
Cc: Zedalis, Morgan

From: Traci Craig, PhD
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Title: 'Nez Perce Environmental Knowledge: Current & Potential Effects on both Tribal and non-Tribal Natural Resource Management Programs and Practices'
Project: 12-207
Approved: 07/17/12
Expires: 07/16/13

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project is approved as offering no significant risk to human subjects.

This approval is valid for one year from the date of this memo. Should there be significant changes in the protocol for this project, it will be necessary for you to resubmit the protocol for review by the Committee.

Traci Craig