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Whitebarkpine Forest Restoration: Cultural Perspectives from Blackfoot Confederacy Members

Kodi Jae Augare-Estey

The University of Montana

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WHITEBARK PINE FOREST RESTORATION:
CULTURAL PERSPECTIVES FROM BLACKFOOT CONFEDERACY MEMBERS
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Whitebark Pine Restoration: Cultural perspectives from Blackfoot Confederacy Members
Chairperson: Dr. John Goodburn

Whitebark pine (WBP) is a keystone species on the brink of extinction, threatened by fire suppression, white pine blister rust, along with mountain pine beetle infestation and climate change. The Blackfoot Confederacy from the Northern Rockies region, as part of their traditional practices and Worldview, has long gathered the nutrient-rich seeds and cambium of whitebark pine as part of their subsistence. This paper demonstrates how the perspectives, indigenous intelligence and worldview of members of the Blackfoot Confederacy could inform and supplement western science and increase the probability of success in restoration efforts whitebark pine forest ecosystems. With Blackfoot Confederacy acculturation and cultural assimilation, their oral history of traditional practices have faded, and the wealth of traditional practices and indigenous intelligence about their natural world could fade away without it ever being adequately documented. Further efforts are necessary to identify and retrieve indigenous intelligence to provide better ecological understanding of whitebark pine forest ecosystems, to give greater acknowledgement of Indigenous ways of knowing, and to preserve the Blackfoot Confederacy and their cultural identity and integrity.

Keywords: Native Peoples, ecological restoration, keystone species, Clark’s Nutcracker, fire, culturally modified tree, Blackfeet, whitebark pine
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Preface

Who am I
A story dedicated to my grandmother Agnes Gaurdipee/Augare

By Buffalo Head Woman (Kodi Jae Augare-Estey)

This is an American Indian story based on a modern Blackfeet woman who is finding her cultural identity. After experiencing a Blackfoot Philosophy course at the Blackfeet Reservation taught by Professor Leroy Little Bear, former Director of the American Indian Program at Harvard University and Professor Emeritus of Native Studies at the University of Lethbridge, I was assigned to write this paper based on what I had learned. The writing assignment was to answer the question “Who am I” as if a “Martian” or some alien from another planet asked “Who are you?”, what would I tell them. This story is offered as a brief introduction to Blackfeet and Blackfoot Confederacy philosophy and worldviews. Given that my thesis project challenged me to bridge Indigenous and Western cultures as I sought to gather Indigenous perspectives from elder members of the Blackfoot Confederacy, it seems an appropriate preface to this paper. Blackfoot philosophy and worldviews are typically conveyed through stories. I
offer my sincere appreciation to Professor Leroy Little Bear, for stories and understanding about Blackfoot Philosophy that he has shared, and which contributed significantly to the following.

Who am I

If a Martian or other Alien from outer space asked me the question “Who are you?” I would begin to tell him -- “Well, in English language, my name is Kodi Augare. And in Blackfoot language my name is Inootogonaki (Buffalo Head Women). I am Blackfeet, part of the Blackfoot Confederacy, and I am rooted in the landscape of Two-Medicine, located southeast of Browning, Montana, where my great grandmothers’ and ancestors’ spirits still live.”

One thing I have learned about myself is that I enjoy stories. My people tell many stories that have a wealth of knowledge and understanding hidden in our oral history. My Elders tell me stories, and sometimes they will repeat the same story, but each time I hear it, I learn something new. My Elders often tell me stories about Napi (the Old Man). Napi is an important character in our creation stories, in which Napi built the mountains, forests, and prairies, and he provided plants and animals, and taught us how to live. But Napi can also appear very silly at times in other stories, and then he is a character who demonstrates to me how not to live, when he is doing foolish or chaotic things. His stories help me to make decisions with respect to all of my relations. Stories are sacred, as never-ending connections, and I can use them to help remind me of who I am.

Once I was asked by an Elder, “Did you ever wonder why Elders never tell stories during the day?” I thought to myself for a moment. And before I could answer well “I never knew Elders did not tell stories during the day,” he went on to say, “Elders
never tell stories during the day because there is a possibility that you could go blind.” I was curious. What did he mean? He said, “You would not be able to see anything (pause), but it is more along the lines that you would not be able to listen.” During the daytime, Elders could be telling a story (pause), and if you don’t follow the protocol of story listening, then you will not be paying attention. Next thing -- you are looking out the window and this is what is meant by saying that “you could go blind”.

With no disrespect to blind people intended, I think the Elder means “if you are not paying attention, you will not learn anything (i.e., go blind to the lesson)”. In this notion, you are unable to see or comprehend life’s opportunities and endless possibilities. After learning this, I respect even further their stories and would rather listen and pay attention to them in the night-time (which in our language translates to dark light). So with this thought in mind, I would ask the alien visitor, “Mr. Martian, can you please show respect to my story by paying close attention while I continue conveying to you who I am”.

In order for you to appreciate and “come to know” who I am, you should know something about how the Blackfoot speaking people came to be, and something about our worldview. In the beginning, Napi (Old Man) decided to make us the Siksikaisitapi. The Siksikaisitapi refers to all of the Blackfoot speaking tribes, and the name means “Blackfoot speaking real people”. One day, Napi sang life into precious mud figures, which were shaped just as I am seen today. From this day on, Napi showed the Siksikaisitapi how to survive (Little Bear 2010).

One critical element of how the Siksikaisitapi learned to survive was by receiving and then communicating with our language. Unfortunately, I am unable to convey to you
“Who I am” in the dynamic Siksikaitsitapi language, but I will try my best to tell you in the English language. And every now and then, I will teach you a fragment of Siksikaitsitapi language. This description of “Who I am” might be far more complicated and dull, than it could be - though, because I have learned that English language is much more limited than our Siksikaitsitapi language. English language might be considered non-active or static, and somewhat limited relative to the Siksikaitsitapi language, which is active or alive. I understand that Siksikaitsitapi language is descriptive, continually moving and verb-based (Little Bear 2010).

My great-grandmother, Pretty Brown-Eyed Woman (also known as Agnes Gaurdiipe/Augare), was a fluent speaker of the Siksikaitsitapi language. One day, I overheard my Siksikaitsitapi Elders visiting with each other about how rich and fruitful they found our Siksikaitsitapi language. I heard them speaking Siksikaitsitapi and their conversational energy excited my spirit. One way in which Siksikaitsitapi Elders help to teach and to pass along their wisdom and experience is by telling stories to other Siksikaitsitapi before going to sleep (Little Bear 2010). At these times, Siksikaitsitapi Elders create a relaxing spirit atmosphere because they understand the influence of stories and how they stem powerful dreams. By doing so, my Siksikaitsitapi Elders promote and support each other’s Siksikaitsitapi dreaming powers. Dreams are very important to the Siksikaitsitapi because they serve as a natural and direct means for acquiring knowledge and establishing a relationship with the Universe.

Elders and ancestors like my great-grandmother are respected keepers of knowledge, wisdom, and experience. They are teachers and facilitators, who guide us as we learn many things, including passing along our peoples’ knowledge and
understanding of the Earth and her creatures and processes. Some refer to this knowledge and collective heritage of human experience with the natural world as “Native Science” (Cajete 2000; Waters 2004), while others refer to it as “indigenous intelligence”, or commonly as “traditional ecological knowledge” in western scientific literature. This knowledge, passed down through countless generations of Indigenous people, tells of our relationships to the world and our search for reality. For thousands of years, Siksikaitsitapi lived in harmony with my local ecosystems, developing a deep understanding of the processes and patterns of our world, essential to securing shelter, food, and community throughout my Traditional Territory. My cultural practices, customs, and Native Science that have been carried down through generations are informed by and in response to the dynamic landscapes from which I come.

One Blackfoot creation story, told by Blackfeet Elder Chewing Black Bones to author Ella Clark (1958), describes how the Northern Rocky Mountain Range of our Homeland was created by Napi, the Old Man. The story tells of how Napi “came from the south, building the mountains, the prairies, and the forest as he traveled”, and creating the birds and animals. After Napi had finished creating the Blackfoot Confederacy’s Traditional Territory, he told all the Siksikaitsitapi to take great care of their homelands Napi indicated the importance of the mountain ranges as being the “Backbone of the World”. In this concept, if our mountain ranges are fractured then my Traditional Territory could possibly be forever paralyzed. This possibility really focuses me on the worth of preserving my Blackfoot Confederacy’s Traditional Territory.
A big part of “Who I am” relates to this Homeland from where I am. I am Blackfeet, part of the Blackfoot Confederacy, and I am rooted in the landscape of Two-Medicine, located southeast of Browning, Montana. The Two Medicine Landscape is nested in the northern Rocky Mountain range. Specific geographic landscapes, like my home in Two Medicine, for example, are understood as places of origin, home of ancestors and relatives, as well as the center of other significant matters in my religious life (Hansford 1988). I believe there is great and sacred power hidden all throughout my homelands and this belief keeps me connected to the land. I feel it is my destiny to find, learn, and come to understand a little bit of the never-ending knowledge locked within my Traditional Territory. In other words the Siksikaitsitapi knowledge is inexhaustible! This is why I believe it is worth the good fight to protect and preserve this eternal “unknown” knowledge of my Homeland from where I come. I feel that to do so is my responsibility.

This desire to be a caretaker of my homelands is deep rooted in my people. I have learned that we Siksikaitsitapi long ago entered into a sacred agreement and an eternal responsibility for us to serve as caretakers of Ihtsipaitapiiyio’pa (which literally translates to “That which causes us to be alive”). Ihtsipaitapiiyio’pa refers to sacred power, a spirit or energy that links to the concept of a life force. This term is also used when addressing The Sacred Power and the Cosmic Universe. It is Ihtsipaitapiiyio’pa that arranges the Universe. Ihtipaitapiiyio’pa is the Source of Life, manifested by the sun and much more. In return for serving as caretakers of Ihtsipaitapiiyio’pa, the Siksikaitsitapi will be provided with sustainable knowledge practices necessary for our continued existence. Furthermore, this life force can be called upon to put things in my mind that will help me
come to understand. It is the relationship between Ihtsipaitapiiyio ’pa and I that guides me in coming to know the power of many things, including the power of places, and my homeland. And this homeland where I come from has played a critical role in the development of my Worldview.

My Worldview is shaped by the Siksikatsitapi collective agreement that certain principles are true. What I enjoy most about the Siksikatsitapi worldview is we believe we and everything else are made up of energy waves and in this notion essentially everything has a spirit. And all these spirits are relational and interdependent on each other for their survival. This is why I have to be respectful to everything around me. I cannot take a rock from the ground because this would be disrespectful to its spirit. Instead, if I take the rock I have to pray and put tobacco out because this is how I show respect to other spirits. If I do not follow this protocol then my spirit becomes unbalanced. When my spirit is unbalanced, I can become vulnerable to negative energy and form into somebody that I am not. On the other hand, when my spirit is balanced, then I am resilient to negative energy around me.

We Siksikatsitapi also believe firmly in the renewal process. An example of a form of renewal is when a naturally caused forest fire burns through some forest. This process allows for the forest to regenerate into a new healthy forest ecosystem. Siksikatsitapi understand how such renewal processes have shaped the structure of the Blackfoot Confederacy’s Traditional Territory, how we are connected to these natural processes on the landscape, and such renewal brings life to our Siksikatsitapi culture and language as well.
One component of our worldview, referred to as “epistemology”, relates to our beliefs about the nature and sources of knowledge. Epistemology questions what knowledge is, and how it can be acquired, as well as the limits, validity, truth, and reality of such knowledge. The Siksikaitsitapi are capable of learning in many different ways. We look for regular patterns. But everything is subjective. This means that I am the only actual expert on what I observe because I am the one actually experiencing it. I make my own personal assessment about a repetitive pattern, and as the pattern keeps happening over and over again, I am going to believe that it is in fact true (Little Bear 2010). However, I must remember (and Napi stories remind me) that there is always a window of uncertainty.

And of course, there are other ways that we Siksikaitsitapi gain knowledge, including from life experiences, dreams, relationships, and through intuiting along with all living things around us. The Siksikaitsitapi concept of Iisskiniip (coming to know) refers to communicating as a “natural democracy” in which Siksikaitsitapi are related to all living things, and interdependent with plants, animals, stones, water, clouds and everything else (Waters 2004).

Given these interconnected relationships, my answer to your question of “Who am I”, might have also been, “I am a little bird named Makkookiim.” The Siksikaitsitapi named me “Makkookiim”, meaning in that language “old lodge cover” (Frantz and Russell 1995), which might have a similar color to mine. The Siksikaitsitapi ancestors have seen Makkookiim collect and distribute seed from a tree called whitebark pine and know that whitebark pine and I are connected, in that I depend upon the tree as a significant early season food source, and the tree depends upon me for its seed.
dissemination. The Siksikaisitisapti have followed me into the mountains to help them find the rich food that whitebark pine nuts provide to them as well, or to tell them if there was a good cone crop or not. Today, many non-Siksikaisitisapti, western scientists are interested in me (calling me Clark’s Nutcracker) and seeking to understand my relationship to the forest ecosystems where I live. They are interested because whitebark pine is threatened and disappearing due to various factors including insects and disease, and because it is I that collect seeds from cones on the tree, eating some and caching thousands of others in small groups about one inch deep in the soil. I will only recover some of the seeds when I return, and the other seeds remain in the ground in a perfect condition for germination so that new whitebark pine trees can grow and produce seeds in years to come. The Siksikaisitisapti have long known of Makkookiim and whitebark pine. The knowledge of this and many other relationships with the world around us, i.e., this knowledge, this indigenous intelligence of the Siksikaisitisapti, is also part of “Who I Am”.

Thus, my answer to “Who I Am” has many components, each connected in many ways to my people, our worldview, our long experience and cultural knowledge, the landscape where I am centered, and all of my own life experiences, dreams, and relationships with my people and natural surroundings. You initially asked me the question “Who are you” and I could have simply told you, “I am all these things and more”. However, the question you asked me is not easily answered with a one line reply. It is more like a never-ending story. We Siksikaisitisapti are holistic thinkers who recognize the connections between all things. In this sense, the more you read my story, the more you will see me emerge out from it in a holistic way, and then will you see more of the big picture answer to your question. The more we take a step back and look at the
bigger picture, the more truth can be revealed about our world, and who we are, and how we are connected. As I mentioned earlier, Stories are sacred, as never-ending connections, and I can use them to help remind me of Who I am.

**Chapter 1: Introduction**

For thousands of years, Indigenous Peoples on the North American continent lived in close relationship with their natural ecosystems, developing an understanding of the processes and patterns of the natural world essential to securing shelter, food, and community within each group’s local region. The cultural practices, customs, and indigenous knowledge which have been carried down through generations were informed by and in response to the dynamic landscapes in which they lived. For example, indigenous people of the Northern Rocky Mountains region have a long history of experience regarding the role of wildfire in shaping natural plant communities, and have utilized burning for a variety of uses including forage improvement and hunting (Stewart 1955). As present-day conservationists wrestle with questions of how to maintain or “restore” species and whole plant communities threatened by human-induced global changes (e.g., introduced species, fire suppression, and warming climate), there has been renewed interest in recognizing this accumulated knowledge of the indigenous people, which might inform such efforts at “restoration”. In the case of high elevation whitebark pine ecosystems that are currently facing multiple threats in the northern Rocky Mountains, conservationists might gain insights from members of the Blackfoot Confederacy who have long interacted with whitebark pine forests within their traditional territory. Separately, as Indigenous groups like the Blackfoot Confederacy move toward greater autonomy in the stewardship of their tribal lands, there has been renewed interest
from tribal members in traditional indigenous cultural practices and perspectives, and how they might be incorporated into management activities or restoration efforts on their traditional territory.

The Blackfoot have long occupied the northwestern plains along the eastern slope of the Rocky Mountains from what is now Glacier National Park north into Alberta, Canada. They were historically nomadic hunters that utilized many different areas of this diverse region, varying in topography, climate, and seasonal productivity. The Blackfoot Confederacy consists of the four tribes or bands, three of which reside in southern Alberta, Canada, including the Sik-si-kah, Kainai (now called Bloods), and the Pikani (known as Peigan). The fourth band is known as the Blackfeet, and located in northern Montana, United States, in the area of Browning. In the Blackfoot language, these four tribes were collectively known as Nitsi-tapi, or “Real People” (Johnston 1987). In this paper, the various tribes will collectively be referred to as the Blackfoot Confederacy (or simply Blackfoot), and the four individual bands as the Blackfeet, the Bloods, the Peigan, and the Siksika Tribes.

Figure 1. The traditional territory of the four bands of the Blackfoot Confederacy.
Within the traditional territory of the Blackfoot Confederacy, whitebark pine ecosystems were most typically found in the mountains at higher elevation up to tree line. The people of the Blackfoot Confederacy were familiar with whitebark pine, and have long utilized it as a source food. They historically harvested the inner bark (cambium) of whitebark pine as a nutritious food supplement in springtime, a period when food sources were relatively scarce (Johnston 1987; Blankinship 1905). In addition, there is evidence that they also occasioned to make use of the nutritious pine nuts from harvested cones. Weatherwax (2008), a Blackfeet Elder, related nostalgic memories of helping his grandmother collect and gather whitebark pine cones during the fall while the men were out hunting. He remembers how his grandmother prepared the nuts by burning the cones in a pile until they became dry. Then for seed extraction, she would tap the burnt cones, which resulted in releasing the pine nuts from the cones. The pine nuts were then put in a raw-hide bag containing salt and water to roast in the fire. Once the seeds were roasted in this way, they either ate them immediately or stored them for later use (Weatherwax 2008). Furthermore, the people of the Blackfoot Confederacy were also familiar with the Clark’s Nutcracker (*Nucifraga columbiana*), which collects and caches whitebark pine nuts. The Blackfoot sometimes followed its movements to cone crops in good years, and named the bird “Makkookiim”, meaning in their language “old lodge cover” (Frantz and Russell 1995), perhaps because of the color of its plumage.

In recent decades, western scientists and land managers have focused greater attention on whitebark pine ecosystems, both for their ecological benefits, and because of multiple threats to their survival brought on by anthropogenic causes. Whitebark pine has been recognized as a critical species in subalpine ecosystems, particularly at higher
elevations where it is the highest-elevation pine tree of these mountains and a major species making up tree line, where exposure to cold and wind induce trees into dwarfed forms growing close to the ground. At timberline and lower elevations, relatively open stands of whitebark pine have a positive effect on snow retention, and consequent increase of water yield to streams through the year. In years of good cone crops, whitebark pine provides a significant, high protein food source for a large number of species, such as pine squirrels, bears (black and grizzly robbing squirrel middens), and seed eating birds including the Clark’s Nutcracker. The mutualistic interaction that has coevolved between the whitebark pine and the Clark’s Nutcracker (CNC) has also generated a great deal of interest, particularly the interdependence of the whitebark pine on the bird’s dissemination of its seeds. The whitebark pine is to large extent dependent on the CNC to promote its natural regeneration via the bird harvesting large numbers of seeds and then caching them in small groups, within recently burned areas (which appear most favorable to whitebark regeneration) and buried about an inch deep the soil. The CNC can utilize the cached in early spring of the following year to feed new young, but typically leaves many caches unrecovered, and in a good condition for the whitebark to germinate (Tombeck et al. 2001).

Along with the ecological importance of whitebark pine and its interesting relationships with wildlife, the greater interest in these ecosystems has focused on the dramatic levels of whitebark pine mortality. Much of this elevated mortality has been attributed to human-induced factors, including a disruption of historic fire disturbance patterns, the introduction of a non-native fungal pathogen, and beetle outbreaks related to climate. Fire exclusion by land management agencies in the past century have disfavored
the early successional whitebark pine, because it has limited creation of newly burned areas that favor regeneration of the pioneer whitebark, and led to succession of more shade tolerant species, spruce and fir. Secondly, the non-native fungal pathogen that has resulted in significant mortality of whitebark and other five-needled pines is white pine blister rust (*Cronartium ribicola*), believed to have been introduced from Europe in 1904 in a shipment of tree seedling stock. And finally, warming temperatures have made high elevation environments more hospitable to the native mountain pine beetle in recent decades. Warmer average temperatures have allowed more rapid development of larval stages of the bark beetle, leading to outbreak population levels, and unprecedented beetle-caused mortality of whitebark pine. These multiple threats to whitebark pine have generated significant concern in management circles, and motivated various research studies aimed at understanding the ecological relationships driving whitebark pine mortality, as well as strategies for promoting its recruitment and survival.

This heightened awareness of the threats to whitebark pine ecosystems has increased interest in the “restoration” of whitebark pine ecosystems, as well as interest in the potential for Indigenous Knowledge to provide any guidance for such restoration efforts. “Ecological restoration” refers to the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (SER 2004). Increasingly, restoration efforts have made attempts to be informed by the experience and accumulated knowledge of the indigenous people that have lived in the area. After all, the Indigenous Tribes of North America have a long-developed, close relationship with the function and structure of forest ecosystems (Martinez 2003). They have often been key players in shaping their landscapes, notably through use of fire, as well as through gathering and
cultivating specific plants for food and medicine. The environmental knowledge developed over thousands of years by indigenous people like the Blackfoot through their long association with specific natural places on earth has been passed on to subsequent generations through oral stories, cultural practices, lived experiences, and spiritual ceremonies. This Indigenous knowledge of the land, which might be informative to restoration efforts, has been labeled “traditional ecological knowledge” (or TEK) in western science (Berkes 1999).

Berkes (1999) defined TEK as a cumulative body of knowledge, practice, and belief about the relationship of living beings (including humans) with one another and their environment, which has accumulated through adaptive processes and been handed down through generations via cultural transmission. It refers to all the innovations and practices developed from experience gained over the centuries and adapted to the local culture and environment and more. Berkes (1999) identified four interrelated levels within TEK. The first level is based on empirical experience essential for survival (species taxonomy, distribution, and life cycles). The second focuses on the understanding of ecological processes and natural resource management (practices, tools, and techniques). The third level relates to the socio-economic organization necessary for effective coordination and cooperation (rules and taboos). And the fourth is referred to as the worldview or “cosmovision” (religion, belief, and ethics).

TEK is different from western science, which tends to be inherently reductionist and abstract, and works to identify discrete, quantifiable components. The western science perspective is often utilitarian, mechanistic, and depersonalized, with ecosystem components valued primarily for their economic potential. Western science leaves little
or no room for the discussion of the sacred or indigenous worldview, while many native rituals and beliefs define a sense of personal responsibility to the environment and reinforce the intimate symbiotic relationship between nature and culture (Berkes 1999). The TEK of indigenous peoples has often been overlooked (if not intentionally dismissed) as not being suitably scientific for modern management decision-making (Thompson 1994), but such knowledge could help build a better understanding of how to restore ecosystems in peril (Watson et al. 2003), such as whitebark pine forests.

The specific terminology “traditional ecological knowledge” (or TEK), while widely used, has been found lacking or inappropriate by some Indigenous leaders and other researchers. The word “traditional” is seen as problematic given its 19th century connotation of simple, sage, and static (Warren 1995; Berkes 1999). “Traditional” suggests something created in the past, brought forward into the present “intact” or “unchanged”, and treated as a fixed, historic artifact (Ingold 2000). But this suggests that the knowledge of Indigenous people is unchanging, frozen in time; like a pot that has already been baked, rather than the clay still being worked by a potter (Davis-Hunt and O’Flaherty 2007). Instead, Indigenous people’s knowledge is not an unchangeable object, but rather it is active and adaptive to change. Further, the terms “ecological” and “knowledge” might both be considered limiting, compared to the full range of cultural and spiritual information that is passed along. It is essential to understand the concept that Indigenous knowledge includes indigenous worldviews, values, and processes (Simpson 2001), as well as specific knowledge about certain plants, or natural patterns. Further, Indigenous people commonly give credit to our spirit helpers who contribute to the collective body of their indigenous intelligence (Simpson 2001). In this paper the
concept of “traditional ecological knowledge” or TEK will be replaced in some cases by the language “Indigenous knowledge” or “Indigenous intelligence”, inspired by Holly Youngbear-Tibbits (2008) from the University of Minnesota.

The Indigenous knowledge of the Blackfoot Confederacy certainly encompasses all four levels described by Berkes (1999), including their culture and worldview (religion, belief, and ethics). Blackfeet Tribal Historic Preservation Officer, John Murray, has helped develop a description of the Blackfoot worldview (Murray 2009, personal communication). Murray stresses how the Blackfoot worldview offers a distinct vision of reality, which not only interprets and orders the places and events in the experience of the Blackfoot people, but lends form, direction, and continuity to life as well. It provides the Blackfoot people with a distinctive identity and set of values. The Blackfoot people develop a feeling of rootedness belonging to a place and time. They feel a sense of continuity with tradition, traditional characters, stories, dreams, songs, night sky, protocols, and place which transcends their experiences throughout a single lifetime. This tradition is so powerful it may be said to transcend even time.

However, there is serious concern among the elders and leaders of the Blackfoot Confederacy that their wealth of Indigenous knowledge about their natural world, as well as their oral history, cultural practices, and spiritual ceremonies have faded in recent generations, owing to a loss of territory, acculturation and cultural assimilation following European settlement. Elders are concerned that their Indigenous intelligence is eroding, as their younger generations have not been learning cultural or ecological teachings sufficiently to pass them on. For example, Turner and Turner (2008) reviewed a series of case examples of culturally valued plants in British Columbia, and found a decreased use
of such plants and dwindling cultural knowledge of the particular plant species over the past 150 years.

As with many indigenous people around the world, there is a strong desire by the Blackfoot to teach the younger generation their Indigenous knowledge in an attempt to maintain ethnic identity and sovereignty (Thompson 1994; Zedeno 2007). Elders believe that it is their responsibility to serve as cultural teachers and pass along Indigenous knowledge of the land to the upcoming generation. Many feel it is important for their offspring to learn and appreciate plants, animals, and ecosystems from their own cultural perspective (Thompson 1994). However, such efforts are all the more challenging because their ancestral landscapes are no longer managed with an Indigenous outlook or worldview. Even on tribal reservation lands, the management may not incorporate cultural perspectives from the Blackfoot. The relationship of the Blackfoot Confederacy to their land and the natural world has been fractured, limiting opportunities for indigenous people to acquire and pass on Indigenous knowledge to younger generations.

Some members of the Blackfoot Confederacy may want forest managers to put greater emphasis on restoring culturally significant species such as whitebark pine, but others may have little or no awareness of this culturally significant tree species that their ancestors once relied on for their subsistence. Some have argued the loss of important ecological resources is in fact tied together with the loss of traditional cultural practices and Indigenous knowledge of the land (Cabrera-Garcia 2006).

Whether or not members of various Blackfoot Confederacy Tribes are aware of culturally significance species such as whitebark pine, their perspectives should be considered, if not incorporated into management for whitebark pine restoration
throughout their traditional territory. It seems vital for management of the Blackfoot Confederacy’s traditional territory to better reflect Blackfoot perspectives. Whitebark pine is seriously threatened at higher elevations within the Blackfoot traditional territories, and perhaps relevant Indigenous knowledge from the Blackfoot could better inform restoration of whitebark pine ecosystems, but such knowledge must be collected and documented to accomplish this goal. As an Indigenous researcher and member of the Blackfeet Tribe, I wanted to make connections with Blackfoot Confederacy’s Tribal Elder experts to hear record their perspectives on management and restoration. I sought to fulfill my cultural responsibility to give back to the “Collective” (Alvin Many Chief 2009), to the wholeness which connects the Blackfoot Confederacy to their world including all of their relations. This research study attempted to demonstrate how Indigenous knowledge from the Blackfoot Confederacy can be collected for incorporation into forest restoration plans to be implemented on their traditional territory. The general research question could be framed as follows: How can the Blackfoot Confederacy’s Indigenous knowledge inform future forest restoration activities of fire-dependent whitebark pine communities throughout their traditional territory?

**Whitebark Pine Status**

The complex and interesting subject of WBP ecology has been well documented by western researchers and one of the most significant findings is WBP communities are seriously threatened, with the loss of the tree species a real possibility. Forest managers are interested in the decline and restoration of WBP ecosystems. There are many restoration ideas and attempts to prevent the decline of WBP and its ecosystem. WBP is
considered a keystone species which contributes to other mountainous structures and functions.

This multipart ecological story recently has been told from a Western worldview with no emphasis on an Indigenous worldview. In order to complete the WBP ecological story for the Blackfoot Confederacy it is necessary to combine Western knowledge and indigenous intelligence about this keystone species. Through this combination, the Blackfoot Confederacy can begin to restore their cultural ways of understanding forest complexities such as WBP communities.

**Incorporating Indigenous intelligence**

The Blackfoot Confederacy and other indigenous Tribes from North America have developed a close relationship with the function and structure of forest ecosystems (Martinez 2003). Many indigenous people, including the Blackfoot Confederacy are key players in shaping their landscapes, through use of fire, gathering and cultivating specific plants for food and medicine. These traditional practices of the forest contain important environmental knowledge known in academia as traditional ecological knowledge (TEK). TEK is different from western science because it is not machine-like. For example, in western science of ecology, Odum (1971) characterized ecological cycles as giant wheels powered by the sun. This machine-like characterization has little or no room for the discussion if ecological ethics and sacredness (Berkes 1999).

TEK is accumulated in many ways for example Berkes et al. (2002) suggests pre-European knowledge systems are encoded in scared rituals and obtained by everyday cultural practices. While TEK of indigenous peoples has often been overlooked (if not intentionally dismissed) as not being suitably scientific for modern management decision-
making (Thompson 1994), such knowledge could help build a better understanding of how to restore WBP forests and other ecosystems in peril (Watson et al. 2003). TEK is well documented in academia but it is sometimes viewed by indigenous people as being politically incorrect. Many researchers found the word traditional as being problematic because, as Warren (1995) put it “traditional” meant the 19th century attitudes of simple sage, and static (Berkes 1999).

Another reason why this word seems problematic is because “traditional” also means something that is created in the past and has been brought into the present intact or unchanged and is often treated as a scared object (Ingold 2000). In this sense, indigenous peoples’ knowledge is thereby frozen in time, like a pot that has been baked, rather than the clay still being worked by a potter (Davis-Hunt and O’Flaherty 2007). Since indigenous people’s knowledge is not an unchangeable sacred object, but rather active and adaptive to change, this paper will not use the term TEK. It is essential to understand the concept of our knowledge which includes indigenous worldviews, values, and processes (Simpson 2001). Indigenous people give credit to our spirit helpers who contribute to our collective body of indigenous intelligence (Simpson 2001). In this paper the concept of TEK will be replaced by the term “indigenous intelligence”, or “indigenous intelligence”. This language change is inspired by Holly Youngbear-Tibbits (2008) from the University of Minnesota.

Indigenous intelligence is developed through long association with specific natural places on earth. Cabrera-Garcia (2006) argued that as the world loses important ecological resources, we should recognize how this loss is connected to the displacement of indigenous people and the associated loss of traditional cultural and spiritual practice.
Some indigenous people believe that they long ago entered into a sacred agreement with the natural world; this agreement connects them spiritually and physically through their ancestor’s and Elder’s stories that relate to their oral history (Cajune et al. 2008). This sacred vow recognized an eternal responsibility for them to serve as caretakers of the natural world. In return, the natural world will forever provide them with sustainable knowledge practices necessary for their existence. This perspective is understood by indigenous Elders who recognize that they are only here for a short time, thus making it critical to take care of the natural world and to pass it on to their children in good condition (Cajune et al. 2008).

Elders serve as cultural teachers by transferring knowledge to the upcoming generation. Indigenous intelligence is a part of a people’s cultural identity which can be received in many ways including observation, oral stories, ceremonies, and dreams (Thompson 1994). Western science does not acknowledge indigenous intelligence as reliable scientific information, either overlooking it completely or dismissing it as being “non-scientific”. This is further devastating because indigenous people no longer manage their ancestral landscapes with an aboriginal outlook. An opportunity for indigenous people to acquire and pass on indigenous intelligence to their future generations has become more limited, and could be fracturing their sacred agreement with the natural world. In this sense, it is crucial for researchers to understand the indigenous meaning and power of scared agreements. Otherwise fragmented sacred agreements result in changes between the people and their standards of living. This has further resulted in changing land management practices from that of indigenous peoples to private and public land managers. Over time, this has contributed to the alteration of culturally
significant habitats, water quality, fish and wildlife populations, as well as effecting the composition and structure of valuable Tribal ecosystems (Lake 2007). The extinction of species, the displacement and marginalization of local communities combined with the loss of indigenous intelligence are unfortunately common and repeating realities (Cabrera-Garcia 2006).

Indigenous intelligence is the detailed ways of knowing, handed-down through generations, that guides management objectives for cultural resources (Immel 1999). Indigenous Elders are concerned that their indigenous intelligence is eroding, as their younger generations are not learning cultural or ecological teachings (Thompson 1994).

But the Elders still believe that it is their cultural responsibility to hand-down indigenous intelligence because it is important to their offspring to learn and appreciate plants, animals, and ecosystems from their own cultural perspective (Thompson 1994). Among the Blackfeet Nation, religious leaders are trying to teach the younger generation their indigenous intelligence in an attempt to maintain ethnic identity and sovereignty (Zedeno 2007). Despite such efforts, the fading indigenous intelligence is a major concern throughout Indian country today. Turner and Turner (2008) reviewed a series of case examples of culturally valued plants in British Columbia, and found a decreased use of such plants and dwindling cultural knowledge of the particular plant species over the past 150 years. Indigenous people have been intimately connected to the natural world for thousands of years, to the extent that Charles Kay characterizes indigenous people as keystone players in shaping North American ecosystems (Martinez 2003). While this connection has been fading over the last two hundred years, there remains a wealth of
traditional knowledge about the earth’s ecosystems that has been passed down through generations in oral stories, cultural practices, and spiritual ceremonies.

Indigenous intelligence originates from the spirit world. It is maintained in very specific and complex ways regarding indigenous standards of living (Simpson 2001). Academia needs to clearly appreciate and understand how indigenous intelligence must be highly respected as a sacred element. This complexity of indigenous intelligence is similar to the structure and functions of ecological processes such as WBP ecosystems.

Today, as an indigenous researcher, I intend to make connections with Blackfoot Confederacy’s Tribal Elder experts in terms of their local plant and animal communities. Working together in this way, the goal of this project is to identify key plant and animal indigenous intelligence related to WBP communities residing within the Blackfoot Confederacy’s traditional territory.

As noted above, there is increasing threats in high elevation forests of the Rocky Mountain region. This highlighted awareness also increased interest in the potential of indigenous intelligence contributing to sustainable forest management and restoration practices. For example, some of the Blackfoot Confederacy members may want forest managers to put greater emphasis on restoring culturally significant species such as WBP. Other Tribal members may have little or no awareness of this significant cultural tree species which their ancestors once relied on for their subsistence.

Some have argued the loss of important ecological resources is tied together with the loss of traditional cultural practices and indigenous intelligence (Cabrera-Garcia 2006). For thousands of years indigenous people understood the function and structure of forest environments for their subsistence (Martinez 2003). An understanding of the
Blackfoot Confederacy’s indigenous intelligence pertaining to WBP ecology could potentially help managers better understand how to restore WPB forests and other vital ecosystems in peril within their traditional territory. The Blackfoot Confederacy’s indigenous intelligence of high elevation forests, which are sacred environments within their traditional territory, can serve as a valuable means for revealing information pertaining to WBP. There may be gaps within the Blackfoot Confederacy’s indigenous intelligence and filling these gaps could help restore WBP along with other ecosystems in danger. It can also restore historical information of the Blackfoot Confederacy’s cultural identity and integrity.

The Blackfoot Confederacy has lived in harmony with their natural ecosystems. They have developed a deep understanding of the processes and patterns, essentially securing shelter, food, and community within their local region. The cultural practices, customs, and indigenous intelligence have been carried down through generations and are formed by and in response to the dynamic landscapes in which they live.

Johnston (1969) and Blankinship (1905) mention the Blackfoot Confederacy consumed WBP pine seeds as part of their traditional diets. Weatherwax (2008) a Blackfeet Elder, has nostalgic memories of helping his grandmother collect and gather WBP cones during the fall while the men were out hunting. He remembers how his grandmother prepared the nuts by burning the cones in a pile until they became dry. She would prearrange the cones for seed extraction. Next, she would tap the burnt cone scale which in turn released the pine nuts. The pine nuts were then put in a raw-hide bag containing salt and water to roast in the fire. When the seeds were roasted they either eat them immediately or stored them for later (Weatherwax 2008). These pine nuts provided
highly nutritious food source along with the inner-bark layer (cambium) to not only the
Blackfoot Confederacy Tribes but also other Tribe who utilized WBP ecosystems (Smith
2008; Ostland at el. 2005; Anderson 2005; Ingmar 2003; Flanagan 2001; Stryd 1997;
Munger 1993; Arno et al. 1990; Tuner at el. 1990; Barrett 1985; White 1954). The
Blackfeet Tribe along with the other Blackfoot Confederacy Tribes also understood the
importance of fire. They, like other indigenous people knew how to make use of this tool
for their survival.

While western science has only recently recognized the role of fire disturbances.
The Blackfeet Tribe have a long history of ecological knowledge regarding the role of
wildfire (Peterson 1999) and in shaping natural plant communities by burning for a
variety of uses including improving forage (Stewart 1955). The role of cultural forest
burning in determining the pattern and frequency of fire in forest ecosystems has been
recognized as a part of recent characterizations of “natural” fire regimes (Agee 1993).
This understanding of natural fire regimes is necessary for restoring a more functional
role of fire within forest ecosystems, some of which have been substantially altered by
fire suppression efforts over the last century (Agee 1993).

Indigenous burning opened up heavily forested areas and enhanced sites for WPB
seed cashings by a little bird called the Clark’s Nutcracker (*Nucifraga columbiana*) and is
responsible for the distribution of WBP seeds (Tomback et al. 2001).

**Whitebark Pine Ecological Relationships**
The Clark’s Nutcracker and WBP are ecological mutually dependent, meaning the Nutcracker depends on WBP as a significant early season food source. In return the WBP depends on the Clark’s Nutcracker for its seed dissemination and regeneration in suitable habitats. Logan and Powell (2001) suggest the mutualism between these two species is keystone for the structure and function of their entire ecosystems. This relationship starts with the bird extracting WBP seeds and storing them in the ground to feed their young in the following spring. The Clark’s Nutcracker can hold up to 100 pine seeds in a sublingual throat pouch. This throat pouch swells up to the size of a golf ball and can weigh up to as much as 25% of the bird’s weight when full of seeds (Ingmar 2003). They then cache thousands of seeds each year, with about 5-15 seeds in each cache, later revisiting these food reserves in late winter through early spring. The bird has a tremendous memory and its visual clue perception allows it to relocate where in its 20 mile radius, it cached seeds (Baker 2000). The Clark’s Nutcracker will only recover some of the seeds cached for food and the other seeds remain in the ground. These seeds remain in the ground and begin to regenerate into multiple clumped WBP groups (Baker 2000).

WBP is considered an ecologically important keystone tree species. It tolerates open sites and poor soils located in high tree-line elevations, where it grows in a form known as krummholz (Arno and Hoff 1990).
This unique growth form allows WBP to tolerate harsh conditions where other pines cannot (Tomback et al. 2001). Krummholz forests are made up of twisted and stunted trees, and therefore were never economically managed; but to most people they are esthetically pleasing (Baker 2000). In this case, WBP species in the past was overlooked in western forest management and never managed for natural generation purposes. Agee (1993) suggests WBP generally is found on southerly or westerly aspects in shallow rocky soils and is exposed to steep, windy, cold environments (Arno and Hoff 1990). In the case of high-elevation WBP ecosystems, fire suppression is only one of multiple human-induced threats to the WBP. Fungal rust and increased mountain pine beetle activity tied to human caused climate change are other recognized threats.

**Threats to WBP Ecosystems**

Threats to WBP have resulted in higher rates of mortality, reduced areas for new seedling establishment, and lowered rates of regeneration throughout its two distinct geographical areas. There are two geographic WBP ranges beginning in central British Columbia, Canada; they later split into the United States, including the Cascade Mountains (Sierra Nevada, to the Ruby Mountains), and into the Northern
White pine blister rust (WPBR) is an introduced tree disease which has resulted in devastating impacts on all five needle pine trees residing in North America. This disease was introduced on seedlings imported from Europe around the 1900’s and has become widespread, with devastating consequences. WPBR is a fungal pathogen (*Cronartium ribicola*) that rotates between a secondary white pine host, primary currant, and gooseberry hosts (Keane and Arno 1993). WPBR’s early symptoms may include noticeable discoloration and pitch flow coming from the infested branch or area. Where the cambium is dead, the bark is sunken or cracked above it. Trees can also have animal chewing on the canker margins from porcupine or squirrels. Usually around springtime the fungus grows and spreads at the canker margins producing yellow to orange, powdery blisters of spores (aecia) in the bark cracks (Hagle et al. 2003). This disease weakens the trees and results with the tree becoming more vulnerable to threats such as mountain pine beetle outbreaks and increased climate change.

The mountain pine beetle (MPB) is a bark beetle which kills trees through a chemically mediated mass attack beginning with the release of aggregation pheromones by a single pioneer (Baker 2000). These beetles chemically communicate to each other when the host tree is either occupied or unoccupied. They will invade trees which are under other environmental stress factors such as drought, disease,
and fire suppression. If the tree is wounded then it is a target host tree for housing high beetle populations.

When bark beetles attack the tree they first inhabit the phloem which later provides food for developing beetle larvae. In this case, bark beetles favor large thick bark trees over small thin barked trees. The MPB does not prefer trees smaller than 10 centimeters in breast height diameter because the phloem is limited (Baker 2000).

Interestingly, WBP does not have very thick bark nor does it grow very large in diameter at higher elevations, however it is a host tree species for the MPB. These outbreaks have been noticed since the 1900’s, and such epidemics remain decades later. They are causing one threat to WBP trees and are drastically reducing the seed production for future regeneration by killing these trees (Baker 2000). The atmospheric temperatures also create unacceptable warmer, drier conditions that result in increased MPB in WBP. Therefore, changing climatic conditions are increasing the spread of MBP through forests that historically were not susceptible to MPB infestation.

Climate change is affecting WBP ecosystems by changing higher colder environments to warmer dryer environments. Running (2006) suggests that high-elevation forests, between 1680 and 2690 meters, which were historically protected from wildfire by later snowpacks, are becoming increasingly vulnerable to wildfire occurrences. He found that the hydrology of western United States is controlled by snow and about 75% of yearly stream flow comes from snowpack. He explains how snowpacks prevent fire danger in arid forests until the spring thaw period ends (Running 2006). Westerling and his co-authors (2006) did a 34 yearlong study with outcomes
suggesting in years of early snowmelt there are five times as many wildfires as compared to years with later snowmelt.

**Summary**

In conclusion, whether or not Blackfoot Confederacy Tribes are aware of culturally significance species such as WBP, their perspectives should be considered if not incorporated with WBP restoration management objective throughout their traditional territory. This is especially true because the Blackfoot Confederacy are key-players in shaping their landscapes, from handed down cultural practices and knowledge. With the increasing threats to high elevation forests in the Cascade and northern Rocky Mountain ranges, there is an increased interest in modern WBP restoration to incorporate indigenous intelligence. In addition, this idea seems vital for managers of the Blackfoot Confederacy’s traditional territory if management is to better reflect the Blackfoot Confederacy’s perspectives. WBP is on the brink of extinction and relevant indigenous intelligence from the Blackfoot Confederacy should be included within future WBP restoration activities throughout their traditional territory, but such knowledge must be collected documented to accomplish this goal.
Chapter 2: Methods

Methodological Approach

For this study I chose a qualitative approach because it permitted the ability to freely explore the Blackfoot Confederacy’s understanding of WBP ecology. Qualitative procedures are usually associated with the social construction paradigm. Atwater (1996) suggests that social constructivists understand the construction of knowledge in terms of social interactions. This framework recognizes the importance of contextual tribal values. On idea that social constructivism conveys is that people can actively construct new knowledge as they interact with their environments. For example, social groups possibly could have constructed things for one another collaboratively, creating a small culture of shared artifacts with shared meaning (Atwater 1996). Shared meaning within specific cultures, such as the Blackfoot Confederacy, could contain some basic patterns of shared beliefs and values that define how they act, judge, decide, and solve problems in life and in the world. However, the Blackfoot Confederacy is not homogenous and their perspectives of forest restoration might vary depending on their Tribal affiliation. In this case, there are multiple realities, rather than one tangible reality.
In this case there also are different realities between Western worldviews and Blackfoot Confederacy worldviews that can beneficially inform current WBP restoration as a whole. WBP ecology has been highly recognized within a Western worldview as a crucial species on the brink of extinction. However, the Blackfoot Confederacy may or may not have similar concerns. If they are concerned about WBP there also can be variation in-between and within Tribal entities pertaining to the extinction of WBP forests.

**Site Selection**

I conducted my research project throughout Blackfoot Confederacy’s traditional territory. The four Tribes and their locations were chosen because I member of the Blackfoot Confederacy. I feel it is our cultural responsibility to give back to our collective, our people.

I wanted to give back by gathering their cultural views of WBP ecology because I think their story is beneficial to restoring WBP throughout our traditional territory. When I started the study I was a BIA employee in Browning, Montana. I wanted to contribute
to this governmental agency by assisting them to better meet the needs of the Blackfeet Tribe in particular. Being a BIA employee/student learner I was able to conduct my research within my summer forestry internship time and salary. I have family who live in Browning, Montana and they were able to provide shelter for me and my family. I have two children and they received Blackfeet benefits such as Tribal healthcare while we resided on the Blackfeet Reservation. I was able to make trips from Browning, Montana (Blackfeet Tribe) to Standoff (Blood Tribe), Brocket (Peigan Tribe), and Glension (Siksika Tribe) Alberta, Canada. I have family in Alberta, Canada and I was be able to reside with them while I gather data there.

**Sampling Approach**

The sampling method used for this project was purposeful/selective sampling method. Coyne (1997) suggests that purposeful sampling in qualitative methods is very different compared to more logical and problematic sampling in statistics. She argues that the power of purposeful sampling is to describe more thoroughly the variation in the group and to understand variation in experiences while investigating core elements and shared outcomes. Therefore, the researcher using a maximum variation sampling strategy would not be attempting to generalize findings to all people or all small groups, but rather looking for information that elucidates programmatic variation and significant common patterns with variation (Coyne 1997).

According to Patton (1990), the logic and strength of purposeful sampling comes from selecting information-rich cases for in-depth studies. By choosing purposeful sampling for my research project I intended to gather in-depth information from culturally rich-Blackfoot Confederacy informants. This procedure allowed for
specification plus select interviewees in regards to the research question. The goal is to investigate problematic issues within forest restoration of the Blackfoot Confederacy’s traditional territory. This can be accomplished by thoroughly describing variations and shared commonalities between Tribal entities and western researchers. In searching for explanations of a problem, Schatzman and Strauss (1973) suggest that after numerous observational visits to the sites, the researcher will know who to sample for the purpose of the research. They suggest the researcher select people according to research goals. This may include categories such as age, gender, status role or function in organization.

**Interviews**

Interviews are particularly useful when an investigator is interested in understanding the perceptions attached to the meanings to phenomena or events (Berg 2009). I conducted semistandardized, recorded interviews. This type of interview falls the two extremes of highly structured and completely unstructured interviews (Berg 2009). It can be used to systematically ask the Blackfoot Confederate Tribes question pertaining to their perspectives of WBP ecology.

Hesse-Biber and Leavy (2008), suggest a good way to capture emergent knowledge within groups is by using a “funnel Structure” for organizing interview questions. In their explanation the funnel metaphor captures the idea of beginning the interview with broad, open questions that are guided toward the participants’ perspectives before shifting toward narrower questions that pursue the researcher’s interests. I understood this process as being similar to the construction of a spider web. I sought to conduct intensive interviews because this is a process in which the researcher establishes and sustains multidimensional and situational appropriate relationships with human
association in its natural setting for the purpose of developing a social scientific understanding of association (Lofland et al. 2006).
Chapter 3: Results

Pauline

*Insights about her as an individual (Her Nature/Identity)*

Pauline is kind and speaks with a calm gentle voice. She lives near the Rocky Mountain Front where she was born and raised on the Blackfeet Indian Reservation. She has a deep love for the earth and she tries to follow the traditional Blackfoot Confederacy (BFC) customs, values, and beliefs. It is important for her to learn everything she can to help protect BFC natural resources. Importantly, she uses many of the plants of this area which are considered to be some of the rarest plants in the United States. She wants to protect them for future generations and hopes to see more protection of plants in this area. Much of her Blackfoot Confederacy Epistemology (BFCE) of the forest originally comes from the mentoring she received from her aunty and her father. It has been developed further over the years through her experience of spending time outdoors. She likes to do many things which pertain to the outdoors including gathering plants for her herbal medicine business (Real Peoples Herbals). She does not call herself an herbalist but she calls herself “...just a plant woman.” In the same way she does not call herself a carpenter and sees herself as just being a person who builds houses.

Currently, Pauline passionately continues to manufacture her plant medicines following the traditional fashion she developed at a young age. She smudges and cleanses her medicinal ingredients assuring the product is high quality. She honors medicinal ingredients and recipes by offering tobacco. Blessing the plants’ spirits by gifting it tobacco, she communicates to them her devotion and gratitude. She recognizes the plants gave their lives she uses in curing the sicknesses of others. Some of these
plants are used in treating significant health concerns like cancer and Diabetes. These two health concerns are currently the primary health battles of the BFC residing on the Blackfeet Indian Reservation. She thinks if the BCF only knew how powerful these plants are, they would learn to honor, use, and protect them.

*Insights into her worldview regarding nature, religion, and management*

Pauline’s traditional background provides important insight into her worldview and how she learned about traditional medicine. In fact, the interview emphasizes that much of her knowledge stems from her primary BFC mentor, in this case her aunty Shelt, a traditional medicine woman. When Pauline was younger, her aunty Shelt taught her how to collect, prepare, and utilize specific plant species in a medicinal fashion or as a healthy food source.

Pauline learned about plants from her Aunty Shelt, who was really devoted to collecting and utilizing plants for traditional use. Aunty Shelt was strict and sincere about going to gather plants in a traditional fashion. She practiced following BFC cultural integrity and “planned on getting” certain plants the night before harvesting them from the mountains. The night prior to harvesting plants they would “pray about it.” In the morning her aunty would wash her face while at the same tell Pauline to clean up because she was going to meet the plant people.

“But then in the morning she’d get up and she’d, you know, wash her face, and she’d make me wash up and clean up, she’d say, because we’re going to meet that dandelion. Always made sure we went to it clean. And then we would smudge with our sweetgrass. And she always had her little bundle of tobacco. And so we’d go to ... where we knew the plants were going to grow and today I can do this just with the sweep of a eye, you can find the grandmother plant. You never
have to look for her. She’s right there. So to her we give our offerings of our tobacco. And then the ones, we ask for the right to take the life force of the plant, you know. You know, it’s just a prayer between, and God and the person. And then the ones around it was called the relatives. So those plants we didn’t gather either. We gave them offerings and asked them. And if there was, you know, a lot of plants, then we’d gather. But if there was just a few, she would say we can’t gather these. But we’d go find something that had similar medicinal properties that was close to it, to that plant, because that way it always ensured that plant was going to be there.” (Pauline, Q1)

Although Pauline gathers plants according to BFC traditional practices, she notes, in the past, different people had their own ritual practices. In her own words:

“Well, I think that everybody is different. And even like 100 years ago there was different bands and, you know, everybody had their own way.”

Aunty Shelt would sing songs while harvesting plants. “…I know she sang different songs, … and she would sing in Indian. But I don’t know if she was just singing a song or if she was singing a song just for them.” This lack of explicitness in instruction was characteristic of traditional BFC mentoring, the elders expected you to pick it up.

“You know, a long time ago, people didn’t tell you things. They just did it. And they expected you to, to pick it up. Yeah, they never said you need to eat this, because it’s good or it’s loaded with vitamin C or something. They never said things like that. They, you just did it ....” (Pauline, Q2)

The mentoring described above is not the only source of Pauline’s knowledge. The relationships with animal people [spirits] communicated in part through dreams is another important source of knowledge. Pauline’s connection with the grizzly bear illustrates this path of knowledge. The grizzly bear is respected by the BFC and represents mental strength, spiritual protection and good physical health. It is taboo for
certain BFC ceremonialists to talk about the grizzly bear, but Pauline is able to discuss
the grizzly bear in her interview.

Pauline notes that she has “learned to have a really healthy respect for the bear.”
She reminisces, how her father interacted with bears. Her dad loved bears. He worked at
the Divide and Looking Glass lookout stations. Sometimes he took his children to work
with him. They stayed in the lookout tower while he went down to play with the bears.
She has nostalgic memories of her dad going wrestling with bears. She told me, “He
always would have bears around.” And “when [we] were little they always had great big
decks around those lookout stations. And he’d make us stay up there. Then he’d go
down and hang out with those bears and even wrestle some of them.”

“...[I] have a really strong spiritual connection and respect for the plants you
know, then they say if you really are devoted, the bear will come to you and teach
you. Well, I had it happen one time. ... the bear came to me in my dream, and he
came, he said ‘I’ve been waiting for you for a long time.’” (Pauline Q3)

This is considered a blessing in BFC culture and some tribal members seek bear
dreams by fasting in the mountains. Some members seek a vision for the grizzly bear to
give them power and many are unsuccessful. She thinks the bear came to her in a dream
because she was dedicated enough to go outside onto her deck to smudge and pray. Even
if there was snow, she shoveled it off the deck to sit there and pray for an hour, or two
hours. She never really prayed for the bear to come to her, but he did and for that she is
thankful.

When the grizzly bear did come to her, it came in her dream. She said, “I did
something really dumb. I showed it my tennis shoes instead of asking it about plants. ...
I’ll never forget it.” When recounted it was as if she recently had the dream. In fact she
had this dream back in 1985 and today it is “fresh in her mind.” During the interview she notes, if the grizzly bear “feeds on this tree [WBP] that makes this tree all that much more important.”

Knowledge of whitebark pine and its traditional uses

Pauline thinks WBP is a pretty tree based on how the bows hang off of it. “It is one of the biggest treats to stop and look at [WBP].” She knows WBP is one tree traditionally used by the BFC. In her role as a traditional medicine woman Pauline’s aunty Shelt used all of the trees and she loved them. Her aunty once told she could dry the seeds and make them into a meal and make breads with them. Pauline has future goals for using WBP seeds, roots and plants to make bannock bread. She remembers seeing her aunty roast WBP seeds: “And my aunt, I can’t remember how she did it, but she would put them in the fire, and then they would open up and then we would eat them.”

Pauline thinks that WBP is an amazing tree for its medicinal and nutritional properties. She said WBP, “has the really early spring needles and they are really sweet so it makes great cough syrup rich with victim C.” She also explains the seasonal use of WBP cones and that in their early stage the cones are a source of real good oils. She said the cones are really greasy. Pauline notes, “one of our very best medicines is that sap.” She said WBP sap is known for “how sweet it is,” and when she makes, “... a cough syrup and it tastes real strong,” she uses WBP sap to make the cough syrup “taste like sugar.”

Pauline’s father taught her about pine sap, telling her it is good medicine for the respiratory system. When they went into the mountains she popped the sap pockets on
the Sub Alpine fir with her thumbnail. Then she ate it. Her dad told her it is good for keeping away sicknesses like colds and flus. He never forced her but rather encouraged her to eat pine sap. He would say, “it’s going to be winter.” Her family would chew globs of sap to prevent them from getting sick.

“And like we had 16 kids in our family. And not one time did any of us ever have to go to the hospital. Never ever in our lives, never had any antibiotics or anything. And it was because, I think it was because we ate a lot of this sap. We was always chewing a big chunk of it. Yeah, so that’s kind of my take on it.” (Pauline, Q4)

She also can, “make really nice salves with it.” One of the salves she makes which has “this tree in it” she calls “Ancient Sun Medicine.” While she learned the medicinal properties described above from her father and aunty Pauline learned about this salve through a dream. She had a dream about this medicine. She saw this tree and two other trees and behind them was the Sun. Pauline noted that people can smell the medicine within Ancient Sun Medicine salve because it is really powerful medicine:

“It’s that powerful. And people think that when you go to use plants, that you should have a whole bunch. But you shouldn’t. You should just have a little teeny bit. Yeah, so that’s, it’s a powerful, very, very powerful tree.” (Pauline, Q5)

Pauline does not believe the medicine properties of WBP only exist in the needles and sap. She notes the tree bark has healthy amounts of nutrients within the cambium layer. She is unsure if WBP is used as sacred incenses for the Medicine Pipe or Holy Smokes ceremonies. She thinks much of this knowledge is lost. She said she doesn’t really know. Overall Pauline has deep respect and reverence for WBP. She notes WBP is a powerful tree and has been a good tree to her. She says, she feels the spirit of WBP and it is powerful.
“[When I am] out there by myself and I sit down ..., you know, I don’t talk to them, but I just... can kind of feel them. And sometimes they’ll even make you cry. And I don’t know if it’s a happy cry or a sad cry, but you’ll just cry. You know how like if you talk to God and sometimes God will make you cry? That’s, that’s the way sometimes these trees ...” (Pauline, Q6)

Pauline’s experience has led her to note that WBP communities often grow in proximity to two other important medicinal plants. The first was Oregon-grape (*Mahonia aquifolium*) along with other yellow root plants.

“I collect Oregon-grape which is one of the very best plants for, oh, gosh, it’s, Oregon-grape is like what a pot scrubber is to a dirty pan. Oregon-grape is for the liver. It’ll go in and just, it’s got a yellow root. Your yellow root plants grow near this. They’re one of the very best cleansers for the liver and kidneys. So that plant especially grows near there. Also I’m trying to think of the plants that I’ve saw near there, and it’s pretty easy. Husk. Husk grows near there. That’s one of our very best antiviral plants.” (Pauline, Q7)

The second species that grows near WBP communities she referred to as husk (scientific name unknown). Husk grows near WBP and it is the most powerful ceremonial plant that she knows of today.

“It’s also one of our best ceremonial plants, most powerful ceremonial plant that I know of today. It’s, it is our best antiviral plant. Yeah, so those are two, two that I could think of right now. I guess I never really looked at the plants under it. I was always just so amazed when I would see this tree.” (Pauline, Q8)

Also, based on her experience, Pauline was somewhat aware of the relationship between the Clark’s Nutcracker (CNC) and WBP however, she had never taken “the time to acknowledge” the significance of that relationship.

“I’ve saw it. I guess I, I never put, I knew that of that the Clark’s nutcracker helped reseed it. But I guess I never really, really took the time to really acknowledge that. I mean, I’d see the nutcracker, how it, it always amazed me
how it flew. And so, but as far as really making that really strong connection, I
guess I didn’t. I guess I will now though. Uh-huh.” (Pauline, Q9)
Pauline appreciated talking about the relationship between CNC and WBP
because it led to a deeper understanding about the relationship between the two species.
She noted she had never really made a “strong connection” between the two before but
she, “will now though,” stating, “….. It’s a good story.” “The bird is amazing, a good
story, interesting.”

Perspectives on issues related to Whitebark pine restoration
As noted above Pauline has deep respect and reverence for whitebark pine. She
feels such a close connection to it that she can “feel” its pain when exploited through
logging.

“You can almost feel their hurt, too, like especially up on Cut Bank Crick when
they did all the logging up there. I spent some time up there. And I didn’t really
 go there because of all the logging. But it just seemed real sad, real sad that
those trees were just feeling bad. And so maybe, maybe we just, you know, maybe
God knows that we need to, to just honor them a little bit more and pay attention
to them.” (Pauline, Q10)
Pauline does not “want to think of it being extinct”.

“Gee, that’s a hard one. It’s hard, because you just don’t want to focus on the,
you know, like I’m just as guilty as everybody. I don’t want to, or most people, I
don’t want to think of it being extinct. And I know it could be, you know, just like
a lot of our plants and stuff, like I was talking about the logging, how they grind
those big powerful, wonderful piles of medicine, just grind it into the earth and so
it wouldn’t surprise me if it became extinct, I guess. I don’t think about that too
much.” (Pauline, Q11)

As the interview excerpt above reveals, Pauline recognizes she uses WBP and this
may contribute to its loss. At the same time, she makes a strong distinction between the
way she (currently) and the BFC (traditionally) use WBP and the exploitation of the tree through commercial logging practices.

Regarding her own use, Pauline says she taught herself how to peel the tree bark off without hurting or harming the tree itself. She remembers watching her Aunty Shelt peel the bark off of trees and she was very mindful to not hurt or damage the tree in any way.

“Yeah, I do. And I guess it’s something I just taught myself, and then I saw my aunt do it where she’d just peel one strip, just one small strip out of a tree. She wouldn’t, she’d always make sure that we didn’t, you know, kill the tree by taking too much.” (Pauline, Q12)

She also notes that, following the example of her aunty Shelt’s traditional practice, she does not gather when there are only a few of the sought after plants to be found (see Pauline Q1). Also, she emphasizes the religious aspect of the gathering process and the careful respect it demonstrates (see Pauline Q1).

In contrast, Pauline views the commercial harvesting practices as being exploitive.

“I guess, well, the only thing that I really saw a lot of is the, you know, the devastation of fires that we’ve had in . . . You see a lot of sections of forests that are dying too, because of this pine beetle. And I wasn’t really aware of the rust thing. But I guess just with that, you know, it’s real hard to see I guess the people that go in and cut the forest so much, like the logging, there’s a lot of logging and really a lot of logging.” (Pauline, Q13)

She feels sad because she thinks our forest is more valuable than timber sale revenue prices today.

As a specific example, she discusses the Red Eagle salvage sale. In 2006, the Blackfeet Indian Reservation consumed approximately 15,000 acres of primary forest
habitat due to the Red Eagle wildland fire. After the fire, salvage logging operations began to harvest what merchantable timber there was left after the fire swiped across the South side of the Reservation. The sale generated about 7 million dollars, but Pauline describes it as something “painful to see”:

“And it really, I guess I feel really, really bad, because we have some plants up there that I know if more people in our community knew about them, they would be, you know, they could, if they took them enough, they would eliminate some of the diseases, like the cancer and diabetes and stuff like that. And what’s really painful is to see them putting a price on our forests and cats going in there. And a plant that I go in, and I’ll only take about four roots, because I honor those roots so much, you know, and I’ll see that just the sweep of a cat where it will just tear up a whole section of those roots.” (Pauline, Q14)

Pauline also expresses deep sadness about the loss of trees on Big Mountain due to widening of the road:

“Yeah, I, I see so much devastation. Like I was going to Big Mountain, and the cedar trees that grow along there, they were widening the road, and there was just cedar trees laying everywhere. They were just laying there dead. And it was like nobody cared. Big dozers moving them and stuff. And I, oh, I wanted to cry. I just wanted to cry so bad, because I just hurt for them. So yeah, it’s, it’s really sad. It makes me want to cry now thinking about, you know, these trees, how pitiful they are.” (Pauline, Q15)

Pauline recognizes there are BFC members who lease forested land to feed summer cattle from off the BIR. She thinks this is damaging the forest by allowing cattle to over graze and transport invasive plant species.

“all the cattle, outside cattle that come in and way up high, I see a lot of things like, oh, a lot of burrs, you know, plants that shouldn’t be up there but because of livestock coming in. There’s the one that I hadn’t seen for years or, you know, it grew like just in the lowland areas. And now it’s, I think they call it ... goat’s
head, and it grows about three feet tall. It’s a burr. When it sticks to your clothes, you can’t pick it off because it hurts. It will stick you. And I notice those are really, there’s really getting to be a lot. And I think that’s from the outside or from the range cattle that are coming in, that too. So I don’t know if I, when I was younger if I just didn’t notice that stuff. But now, you know, I just see where, where it’s really having a huge affect on our forests is range cattle coming in.”

(Pauline, Q16)

Though she is concerned about the exploitation of WBP and other trees through commercial harvesting, Pauline is not concerned about the Mountain Pine Beetle (*Dendroctonus ponderosae*) (MPB) epidemic. She thinks the MBP epidemic is forewarning people. It serves as an indicator species letting the people know sickness is coming. Her perspective stems in part from BFC traditions about the relationship between people and animals and partly from her knowledge about the medicinal properties of the sap from WBP and other pine trees. In regard to relations between animals and people, she believes that a long time ago animals and insects helped teach the BCF about the MBP larvae (worm) trying to help the people. As noted above in the section on traditional uses of WBP, she learned from her father that pine sap was a good respiratory medicine. Combining these two traditional beliefs, Pauline concludes the MBP is trying to help the people. The pine sap globs appear on trees as an insect and disease defensive mechanism. Under extreme stress and invasion of the MPB, trees produce sap to prevent bark beetles from laying their eggs inside the tree. By this defensive process a rich source of respiratory medicine is abundantly produced. In other words, by burrowing into the tree and causing the tree to produce sap or pitch globs that can be gathered for medicinal properties.
“I have this belief that if something, like a long time ago animals and the insects helped teach our people things. And right now there’s really a lot of respiratory problems, respiratory diseases, diseases that are coming around that’s affecting the respiratory system. And to me it’s like that worm is trying to help our people. And when you find where it hits that tree, there’s a great big old glob of sap. And that sap is some of the very best medicine for the respiratory system. And I use it in a salve. I call it my Respiratory and Chest Balm. And that’s one of my main ingredients is that pine sap.” (Pauline, Q17)

Though she is aware of the MBP outbreaks, Pauline “[isn’t] really aware of the rust thing”. But when it was described to her, she is supportive of genetically modifying WBP to protect it from the disease White Pine Blister Rust (WPBR). Her acceptance of this approach stems from her drawing the analogy between this approach and medically treating human diseases.

“[It is] just like, you know, modern medicine. There’s a lot of good to modern medicine, and then there’s a lot of ways that we need to take our natural medicines to, for healing. And there’s a lot of really good people out there that are really good doctors and nurses. And they’ve studied it really deep. So possibly it’s the same thing with these, what they’re doing is, is maybe, you know, it could be just like modern medicine is too. You know, there’s a lot of good in it, so I don’t really know that much about it. But, but I think, you know, people, it’s going to take all kinds of people to study it or to help try to ... preserve it.”
(Pauline, Q18)

Pauline’s unqualified support for the use of scientific technology (genetic modification) to help protect WBP from WPBR (an invasive disease that comes from Eurasia) stands in interesting contrast to her reservations about using scientific technology to better understand the relationship between WBP and CNC. She was asked what she thinks about monitoring CNC (a native species) with a tracking device and her answer was, “I don’t really know. I, you know, can’t, I don’t think I can answer that,
because you sure hate to see them be putting things on birds. Yeah, so that, that’s kind of a hard one.” In the short space of the interview she was uncertain how to resolve the dilemma this question posed for her and given the chance to skip the question and move on to a new conversational topic, that is what she preferred to do.

When asked if she felt that the “the Blackfeet people have an obligation to help ensure that white bark pine continues to thrive here, continues to grow here?”, Pauline replied:

Oh, yeah, absolutely, absolutely. Mostly our people here, because, you know, just because where our Blackfeet Nation is now is what they call the reservation doesn’t mean that we still don’t have ownership to all the land, previous land. And so we do. It’s our responsibility. And there’s a lot of ways that we can, can contribute to that. Uh-huh. (Pauline Q19)

Overall, Pauline has great faith WBPC will come back naturally. She thinks if Creator God witnesses the people honoring this tree it will come back naturally on its own. She thinks honoring the trees is the answer to preventing the loss of WBPC. To enhance future environmental health she recommends people to honor the forest rather than take it for granted. “I really think if we start honoring these trees and just stop cutting them and, you know, doing all the things, the destruction, I think that’s when we’re going to find the answers is when we, when we do really take the time to understand the spirit of the tree.”

Clarence

Background Information - Who Clarence Is

Clarence served in the Military overseas for a number of years keeping peace in the Mediterranean. When he returned from the military he was honored with the sacred name Red Crane by the old people of the sacred societies including the Brave Dogs
Society (a warrior society). Red Crane is a powerful name that is 300 years old. It comes from a war chief of the Siksika Nation, originally located in the vicinity of what is now Alberta Canada. Clarence told me,

“Red Crane is about four generations back on my father’s side, so that name dates back to about 300, 400 years ago. So Red Crane was a war chief who looked after our ... eastern borders of our territory that’s going towards now Saskatchewan.” (Clarence, Q1)

To this day Clarence and his wife are affiliated with the sacred societies including leaders within the Horns Society.

Clarence also policed his people for 14 years. He served seven terms in Siksika tribal leadership and in the last three terms he was a deputy chief. He described himself as the “parliamentarian” for the council and wrote all of the procedures for the tribal council’s code of ethics. Further, when the council got off track in certain conversations he, with the raise of one hand would silence the people. He did this to refocus the tribal council preventing them from moving on to other topics until the present conversation was addressed. He also has been a Traditional Land Use Coordinator for the Siksika Nation.

Clarence’s Perspectives on Indigenous Epistemology

Early in the interview Clarence focused on knowledge that stems from his past occupation as a Traditional Land Use Coordinator for the Siksika Nation. Clarence coordinated with entities including the Canadian government with oil and gas exploration companies planning to conduct business within the Blackfoot Traditional Territory. Whenever these entities planned to conduct business throughout the Blackfoot Traditional Territory they contacted and coordinated their goals and objective with Clarence.
“They’re the ones that I help negotiate the work plan and the company pays for the work we got to do. So we go out. And we finished ... what is called the eastern slopes, they call it ground truthsing program. But basically it means ... that we go into the area, and we look at the whole area: trees, plants, animals, everything. And we use polygons to indicate our hunting areas, where those animals go. Where’s species of trees, flowers, everything, rocks, anything that even underneath the ground. So this tree you’re looking at [WBP], there are, a lot of these trees grow in the high elevation areas.” (Clarence, Q2)

And then when we got there, that’s where we found a lot of, a lot of these, these species, like what do you call it, the white bark pine.... But there is, here, this category. See, when we look at the map and they indicate white spruce, birch, white birch, lodgepole pine and all that kind of stuff. So when we know that these things are there, we know they’re moving up into a lot of rocky country. ... And then the old species which are still remnants that are there. (Clarence, Q3)

But a thorough analysis of the interview suggests that, while he is comfortable with ‘present experience’ as a means of documenting how things are on the ground today, when it comes to knowledge of how things should be (the proper relationship between nature and humans), Clarence has greater faith in traditional cultural wisdom passed down through elders as illustrated in the excerpts discussed below.

Though Clarence refers to the significance of traditional cultural knowledge throughout the interview, he makes his strongest statement toward the end of the interview.

“See, because now the traditional people, they’re very, how I learn about the in-depth stuff is through ORAL teachings, is through stories, is through storytelling and oral history. But the new generation now is more accustomed to the contemporary approach. And this WRITING when I tell a story, like years ago,
MAYBE my great grandpa and he told a story similar to this. And somebody wrote it down. And now he’s ... an expert and he’s got a book - in Canada they call [the book] The Boreal Forest. And we’re working with archeologists checking pipelines. And then they say well in The Boreal Forest book, that’s what they call it. I says well, in Blackfoot oral history, this is the Blackfoot name for it. Try and find that in your book. All I’m worried about is how, what time of the season does it come out. If I don’t catch it at that time, it’s going to hide on me. You can’t find it unless you know where you’re going to look for it, because the flower’s gone. ... You got to look close then somebody say what you looking for? Just wait. And you look over here. There’s another one but similar to this, but this is younger and this is old.” (Clarence, Q4)

Though subtly expressed, this quote suggests one of the reasons Clarence values oral teachings from elders over what might be referred to as ‘experience in the present’ derived from his work described in quotes 2 and 3 above. Experience in the present is built from observations at particular moments in time and is thus is potentially incomplete. Quote 4 suggests that he does not trust books to capture this kind of ephemeral characteristic. Instead he has greater faith in oral knowledge because it is built over generations.

Clarence also seems to have more faith in orally transmitted knowledge because, unlike a book, its transmission to the next generation entails an active exercise of judgment and wisdom by elders.

“So any time my elders are going to tell me, going to give me another gift of ... how to do something, how to understand the inside of this, they will say ‘My child.’ When I’m in the society now, I’m just like a child. The guys that pass those things onto us are my parents. And when I pass these on, I become the parent, they become the grandparent. And then when these guys pass on, I become the grandparent, they become the elder. So that process may take, these guys may have it for ten years as children. There’s no time limit. They’ll know
when to pass it on. And the next ones might hold it for another ten years or five years. Or maybe ... When they got it, they waited 25 years, because the old people figured it wasn’t time to pass them on. ... maybe they felt that there was so much that they have learned that maybe the next generation won’t have discipline or patience like they have. There’s three virtues. One, you got to have respect for what you do. Two, you have to have discipline. You don’t create a story just for the sake of saying something, like what I told you. I’m only telling you what I know. ... I can’t, ever can’t make up anything, because the Creator’s listening ... The other one is most, the most difficult one is patience. Sometimes I have to pray very hard to keep myself on that. And sometimes somebody bad mouths you. I have to listen to that person. And when he’s done, I don’t walk away from him, because these are the people that I pray for. And if he stomps away raving mad, before he takes two steps, I say a prayer for him. I say help this young person to understand his anger. I love that person, and I hope he has love for him or herself. (Clarence, Q5)

Thus orally transmitted knowledge is held for a long time before the knowledge holder is ready to pass it on and possibly longer still while the holder discerns whether the next generation is ready to receive it and judgment about whether the recipient has successfully received it. These processes require judgment not possible in books.

Quote 5 also indicates one of the underlying cultural bases for truth: “I can’t ever make up anything, because the Creator’s listening”. In this traditional oral education process an elder focuses on “what I know.” As quotes 6 and 7 demonstrate, for Clarence ‘what I know’ includes knowledge transferred actively from an elder to an appropriately attentive student.

“And then once you’re in a society, you got to adhere to the Creator’s rules. And those are unwritten. Those are done through ceremony. Those are done through various transfer in the initiation rites that you do. But everything that I do, everything that I talk about, so everything that I'm talking about even now,
about the birds, it’s like I’m transferring, **I’m initiating you of the knowledge that I have**. So in a sense, because you’re going to relay that to whoever, to try and protect these species, the birds and the trees.” (Clarence, Q6)

“But ... some of the things I will tell you is the things that I know. ... I do know because I heard that, I know an elderly lady talking about that gummy stuff. **So I was there when I was little, I heard her.** I says what do you use it for? ‘Well, if you get a little you put it on there. Sometimes you’re on the move and it’s snow, whatever.’ Okay, yeah, it’s good temporary stuff, uses. But there’s other stuff they use it for. And that’s what the old lady said. Yeah. That’s my great aunt.” (Clarence, Q7)

As the three preceding quotes suggest, the nature and manner of transmission of knowledge is extremely important. ‘What is known’ does not equate simply to everything thing a person has heard or done. For example, ‘second hand’ knowledge (quote 8) does not count among the ‘knowledge I know’. Additionally knowledge can be lost in the absence of an attentive or inquiring student (quotes 9 and 10)

“But some of the things I hear secondhand. Let’s say a person says somebody told me this, and this other person told him that but they’re [knowledge transmitted that way is] kind of fragmented.” (Clarence, Q8)

“I went to Montana with my, my dad’s brother-in-law, his half sisters. And his brother-in-law was an old warrior. ... And the old man was looking for these. ... The old man was saying I got to find the ... cones. ... he was looking for these, like big ones. ... And then he said I need them. But he never told me what he used them for. But I know we brought a whole bunch back.” (Clarence, Q9)

“Do you actually wonder why they don’t tell stories in the daytime? They say if you tell stories in the daytime, you’re going to go blind. And I always thought physically I’m not going to see. But you know what they were saying? Because if
I tell these stories and you are not attentive and you haven’t learned protocol, you’ll be looking out the window at the buildings, if you listen to something else, you’ll be doing something with your hands. So your attention. That’s why in the nighttime old people, they put blanket on windows, because they respect the nighttime and the spirits of the night. And then they let the children sit, they’re attentive have something to eat. They’re getting ready for bed. And then they have to have comfortable so they can sleep good. So the grandmother will say now we’re going to tell you some story. So then when you go to sleep, you have beautiful dream.” (Clarence, Q10)

As quote 10 suggests, the linkage between stories and dreams (and visions) are an important aspect of how knowledge is transmitted.

CLARENCE: So what happens is when I went in, the lodge itself is the vision how the animal gave that design to him it come in a dream. Or it could come in a vision. ... INTERVIEWER: What’s the difference between a dream and a vision? CLARENCE: A vision is where you’re actually in the dream. You’re actually in the realm of that animal. (Clarence, Q11)

Further, Clarence noted a significant contemporary concern is that the kinds of stories children are told in contemporary culture are detrimental.

“Now you got these things in here. We watch TV all day. You roll around forever trying to go to sleep. Well what kind of stories did you hear? Violence, bad thing. That’s all you see, violence, bad thing, so no wonder you roll there, because it’s your spirit. What’s in this body that I’m supposed to go back to? It’s not clean, and the spirit, they won’t go back to....” (Clarence, Q12)

Quotes 10, 11, and 12 begin the move into a more spiritual realm of knowledge than is typically found in cultures dominated by a western view of science. In Clarence’s more spiritually oriented worldview, plants and animals are another route by how knowledge is transmitted to people.
“The trees have a song. ... The eagle has a song, every animal ... The trees and the plants are the mediators between us and the spiritual. That’s their job. So ... if an animal is going to give me his gifts, his powers, what do you do? We use sweetgrass. We use Mother Earth as your base. Then you use an ember, a fire ember that comes from these. ... Some use sage. ... [or] a fungus on certain trees ... ... so [you have] to go to an elder, a qualified elder that has been given that honor.  (Clarence, Q13)

In closing this section on Clarence’s perspectives on indigenous epistemology, the interview suggests that yet a third factor may influence why Clarence is somewhat skeptical of the kind of ‘book knowledge’ found in western science. Recall that earlier excerpts indicated he prioritized knowledge built up over generations over observations in the present (see discussion associated with quote 4). Other portions of the interview indicate that Clarence strongly believes the environment as it exists now is one that has been one damaged, contaminated, and turned upside down by civilization.

“It’s the same thing up here. Because ... the environment, the habitat they live is so, it has changed so much because ... of civilization, ... places where there used to be very quiet, used to be just for them. Now because of all kinds of, what do you call it, forestry operations, oil and gas operations, pipelines being built ...” (Clarence, Q14)

“... the air we breathe is being poisoned, the waters that are flowing are contaminated. They’re not as good as they used to be. And then even where their migratory routes and see, they follow a set pattern, just like, just like . . . Well, say, for example, the eagle. The eagles used to be very abundant in the prairie because of overhunting where they are just taking the lives of the animal for the sake of maybe the almighty dollar or just for the sake of killing the bird. So their patterns of migration and where they survive has drastically changed. It has shifted to, well, [an eagle says] I’ll take this route. But I know the experience I’ve
had on that when I took this route. So I’ll take an alternate route so that I can, so that I can survive. So the animals are very smart, you know…” (Clarence, Q15)

“So when you look at the bird, environment is all upside down is that he’s barely surviving. He barely has enough stuff to stuff in his mouth.” (Clarence, Q16)

In other words, Clarence seems to suggest that knowledge gained about plants, animals, and habitats in the present may reflect a very different situation than how these entities were once interconnected in a healthy environment. Additionally, it should not be surprising that Clarence places less faith in a cultural knowledge base that is seen as the cause of this kind of disruption to an environment that his cultural knowledge sees as so interconnected and interdependent.

**Clarence’s Knowledge of WBP in Relation to the BFC**

As indicated in quotes 2 and 3, Clarence was familiar with WBP and where it is currently found. When asked about whether WBP had ceremonial uses, he first indicated that Sweet Pine is more significant for BFC ceremonies. However, he did point out one important and less well known use of WBP.

“We don’t normally camp in, in the mountains with teepees and all that. But one of the things people don’t know, we also build a sweat lodge kind of a shelter. You know how a sweat lodge is kind of that shape... [but the kind built in the mountains is] not as high [as the typical sweat lodge]. ... So that’s what you build in, when you go up in high elevation, because you can’t cart, that’s where these [WBPs] come in. Because those are good, and they’ll put them on, if you put them like this, they kind of give a little bit of a barrier. And then they put their ... their buffalo hide ... underneath.” (Clarence, Q17)

He also knew that the WBP sap had important practical uses:
“... we do use that [the gummy sap] for a lot of things, because it’s very waterproof, very, if you put it on, ... it’s kind of like, kind of like putty.”

(Clarence, Q18)

Clarence shared these first two BFC uses of WBP because these were things he knew. The latter use (Q18) he knew because his great Aunt had taught him directly when he as an attentive student (see also discussion associated with quote 10 in the indigenous epistemology section).

“But I do know because I heard that, I know an elderly lady talking about that gummy stuff. So I was there when I was little I heard her. I says what do you use it for? Well, if you get a little you put it on there.” (Clarence, Q19)

In contrast, when asked about other BFC uses of WBP, he was more cautious, not wanting to present as knowledge things he felt he did not know. He treated almost as rumors (Q20) or as lost knowledge (Q21) information he was aware of but that had not been transmitted in the culturally appropriate ways described in the preceding section (see Q5, Q10, Q13, and associated discussions in the section on indigenous epistemology). For example, when asked about possible medicinal uses of WBP, he responded:

“I do know some people talk about it in that fashion. But one of the things I, see, some of the things I will tell you is the things that I know. But some of the things I hear secondhand. Let’s say a person says somebody told me this, and this other person told him that but they’re [knowledge transmitted that way is] kind of fragmented.” (Clarence, Q20)

And as a somewhat different example, one illustrating lost knowledge, when I asked Clarence about WBP cones he told me a story about his dad’s bother in-law, an old warrior.
“I went to Montana with my, my dad’s brother-in-law, his half sisters. And his brother-in-law was an old warrior. And we went to around Browning … And the old man was looking for these. … cones. … there’s a name for them, because we don’t use the Blackfoot [language] where it’s often, we forget the name. But I know he was looking for these, like big ones. And then he said I need them. But he never told me what he used them for. But I know we brought a whole bunch back.” (Clarence, Q21)

So Clarence was aware that the old worrier chief relied on WBP cones for something. The large number of cones collected suggests it was for something significant, but Clarence does not know and would not speculate on the use since it was not something he knew in the culturally appropriate way.

Views about WBP Restoration Strategies and Management in General

In Clarence’s past occupation as a Cultural Land Use Coordinator, if an agency planned to conduct a prescribed burn in the foothills they would have to notify him. Once he was notified he would go out gathering WBP cones. This was done as attempt to save the species and doing so was consistent with his concern about the damage that contemporary civilization causes.

“But everything that I do, everything that I talk about, so everything that I’m talking about even now, about the birds, it’s like I’m transferring, I’m initiating you of the knowledge that I have. So in a sense, because you’re going to relay that to whoever, to try and protect these species, the birds and the trees. … because .. .the air we breathe is being poisoned, the waters that are flowing are contaminated. They’re not as good as they used to be.” (Clarence, Q22)

In fact, he strongly felt that BFC traditional knowledge was essential to successful conservation, in part because that knowledge was so well grounded in intergenerational experience and came from a time prior to the current disruption.
“So part of the management is you’ve got to understand the traditional ways that we managed and respected the conservation of ... The other thing is maybe to involve you might say the Native Americans. We were there for ever since time, way back. They got to be involved if they change any management ways of doing things, procedures and stuff.” (Clarence, Q23)

When asked about genetic modification of WBP to protect against WBPR

Clarence indicated that he was concerned about adopting this approach to conservation.

**INTERVIEWER:** Did you hear anything about genetically modifying white bark pine trees where they might have a genetic resistance to the white pine blister rust? **CLARENCE:** Well, I heard a little bit about it. Yeah, yeah.

**INTERVIEWER:** Do you think that’s okay to kind of select genes ...?

**CLARENCE:** Looking at it ... from my perspective, if you start changing the makeup, the originality of some living thing, somewhere down the line you’re going to forget something. You’re not, you’re kind of shooting for close to 100% of the originality. But you’re going to end up, because everything starts with a very microscopic thing. You know, it’s just like organisms, they’re very small, in drops of water in the beginning of life. That’s why they’re going to Mars. They rammed the moon which we pray to, which we use in our societies as [starts speaking Blackfoot]” (Clarence, Q24)

This quote indicates that Clarence is concerned with manipulating the makeup of things for fear of losing important parts. But, before shifting into the Blackfoot language comments, the quote suggests a more deeply rooted concern – such manipulation runs counter to principles in Blackfoot philosophy.

While Clarence was concerned with genetic modification as a management response, he was not in opposition to all forms of western technology as a means of conservation management. When asked about using radio collars to track Clark’s Nutcrackers he was supportive of the idea.
INTERVIEWER: I was just wondering ... do you think [in] our culture, is it okay to radio collar that bird’s leg to learn more about him and what he does?

CLARENCE: I think, yes, I think it’s a good idea. **Like there’s a simple rule as society people we go by. And then once you’re in a society, you got to adhere to the Creator’s rules.** And those are unwritten. ... So in a sense, because you’re going to relay that to whoever, to try and protect these species, the birds and the trees. ... **because now ... the air we breathe is being poisoned, the waters that are flowing are contaminated.** (Clarence, Q24)

And like, I guess in a sense the question you ask is it okay to track these animals, where they go. **It’s not a one line answer**, because when you talk to a traditional person, they will talk about the story of this animal, this bird and the relationship it has with the environment it’s in. And the relationship with everything outside that perimeter and the extenuated. And even when and where it goes, if it does migrate, where it ends up at. **So when you look at it, it’s kind of like a ... a never ending story.** So yes. Yes, it’s good . . . And then you’ll be able to know where do these birds go. Where do they raise their young? ... And how do they come back? And how is the environment at the present time? So part of conservation is if this environment is being invaded by, and destroyed by various other extenuating human factors, even their own cycle of existence, then, then people got to start doing something about it and say yes. (Clarence, Q25)

These quotes pack in a complex set of ideas in a short space. In part they suggest that Clarence’s acceptance of this form of western technology stems from its consistency with BFC religious beliefs (as opposed to the genetic modification described in quote 23). Additionally, quotes 24 and 25 indicate Clarence sees it as appropriate in part because it is an attempt to address the damage caused by practices of modern western civilization in a meaningful way (one that does not provide a ‘one line answer’ but that instead contributes to the ‘never ending story’).
After an extended discussion of other issues, Clarence returns to the topic of radio tracking later in the interview in a commentary that demonstrates the interconnections between humans and animals that underlies his perspective on indigenous epistemology. As quote 26 below indicates there is a connection between the problems that environmental disruption causes people and animals. In the current circumstances, both humans and birds seem to need tracking to understand where they go in order to best help them.

“I think today, we always have to try and find a way of keeping track of each other, even us. ... today young people, they just go all over the place. ... like going out late at night. And they just wander around, so we don’t know where they go? Because they’re trying to find a way of fitting in or trying to survive out there because there’s peer pressure. ... And if they’re kind of like the odd man out, then he has a tough time trying to fit in when he goes, when it’s morning, he’s got to go to school, he’s got to face his friends so called friends. So when you look at the bird, environment is all upside down ... he’s barely surviving. He barely has enough stuff to stuff in his mouth. Then he has to go some, he has to be like the little kid. He flies over here, flies over here, flies over there... ... And then the little ones are going to have to pick up on the lessons of where they get their survival food. So when you track them, then at least you know here’s where they go at certain times of the season. ... So yes, it’s good to track them. But I think in a way I’m talking about it from the sense of whatever this person does, how, wherever it goes, we’re part of that situation as human beings. We’re part of that whole survival cycle of these [animals]. When we weren’t here, then it’s just between them for this and everything around there. And then we came in, and then we turn everything upside down. And wherever they live, the climatic shifts affects this. The water shifts. If the water, it has the nutrients it needs, and all of a sudden it’s just a trickle of something up here is putting something else in there, and it doesn’t have, and it, the eagles get sick and it dies. So when you answer yes, that’s what it encompasses. It gives kind of like a, it gives it a little
...a bit more of a helping hand to this. So the conservation officers and the environmentalists and all those people, they take that and say yeah, we got to do more on our side. (Clarence, Q26)

Thus, unlike genetic modification which he expresses concern about, Clarence embraces the use of radio tracking. Quotes 24 and 25 suggest this acceptability is in part because the current environment is damaged and new knowledge is needed to address the problems and in part because this approach is consistent with the religious principles. And quote 26 implies that radio tracking is acceptable, from Clarence’s perspective, in part because it reflects the appropriate relationship between animals and humans in the sense that what we would do to help this bird is consistent with what we would do to help people living in a damaged environment.

Finally in terms of management, the interview briefly touched on Clarence’s perspective on mountain pine beetle.

Because ...the environment, the habitat they live is so, it has changed so much because of, of civilization, because of where, places where there used to be very quiet, used to be just for them. Now because of all kinds of, what do you call it, forestry operations, oil and gas operations, pipelines being built across the border and back, all these things have an affect on the air they breathe in the habitat where they’re at. (Clarence Q27)

“...And now we have insects that are killing species of trees, like the pine beetle. And then so ... all those relationships have, and even the beetle, when it’s there, maybe it’s there for a reason, because he cannot be here in B.C. So it has migrated into where there’s abundance. That’s the reason they thrive on. ... trying to kill the young trees that are going to bring more trees in the future. So that’s, that they’re suffering all the way around. So when you talk about
environment, you talk about habitat. ... So part of conservation is if this environment is being invaded by, and destroyed by various other extenuating human factors, even their own cycle of existence, then, then people got to start doing something about it and say yes.” (Clarence, Q28)

This quote suggests Clarence believes that MBP have a purpose, but the extensive damage they are currently causing is a consequence of human disruption of the natural system.

**Jolene**

*Background information – Who Jolene Is*

Jolene introduces herself as a tribally enrolled Blackfeet woman who was raised on the Blackfeet Indian reservation in the Willow Creek area. She recalled “That’s where my grandparents had had their home, close to the Willow Creek area. And that’s where we resided, in a little shack with them when we were younger.” Jolene lived on the reservation the first 22 years of her life and due to the lack of education and employment she relocated to Washington State. Since then she has been away from the Blackfeet Reservation for over twenty years. She has maintained a great appreciation for her experiences and knowledge gained from her cultural ties to her people and she will often come back to visit her BFC relatives.

*Jolene’s Perspectives on Indigenous Epistemology*

Jolene encompasses a great understanding and appreciation of deeply-rooted Blackfoot philosophy, with a familiarity of traditional cultural practices in the forest. She was taught at a young age that whatever you take from the land, you have to give something back. There used to be “…a lot of trees here…We were always taught to take of the [land] because it belongs to Mother Earth and it’s precious.” Jolene also recalls
being told by her elders to not over harvest the land and be respectful and mindful of gathering from Mother Earth. She said, “...Anything we took from the land, we had to pray to return to the land... we were always taught to put back...” Harvesting from the land in Blackfoot encompasses a complexity of spiritual connection, relationship and understanding. A part of this complexity of Traditional harvesting includes being thankful, conservative, and sustainable as well preservative. Jolene like Betty shares similar perspectives regarding respect and preservation and a spiritual connection. Betty said, “...there was thoughtfulness behind anything we took from nature. A prayer before, a song of that plant, that animal.” and “always with consideration of future generations of trees, of birds, of bears surviving to live in balance with humanity.” Correspondingly, Jolene states:

“You pray to the land. You take out ... what you need, maybe your medicine or maybe something you found that you know that you have to use. You take a piece of that, and you bury it back in. The next year you come back, there’ll be three, four, five growing in that same spot. Yeah. Everything you took you made sure you put something back.” (Jolene, Q1)

Throughout the interview, Jolene revisited the BFC perspective of caring for the land and giving something back in order to “replenish” the land. The idea seems central to Jolene’s own view of the forest and the importance of maintaining balance and reciprocity between the BFC and Mother Earth. Quotes 3 and 4 below express the perspective that the forest is sacred, and that the people had indigenous knowledge on how to replenish the land and to avoid exhausting an area.

A long time ago all the Native Americans always, from what I was taught, that the forest was always sacred. And everything in it, it equalized out. Everything in it that you seen back then, it kept the native people basically alive. They knew how
to eat off the land and replenish the land, not take too much or not destroy the land. (Jolene, Q3)

Anything they took, they would put back ... As long as they lived that lifestyle and they would go away, let [rest] that certain part where they camped, maybe they stayed there a winter in a certain camp in a forest. Then they’d go away for two, three, four winters before they come back there so that place would be totally replenished by the time they came back. ... No, they never, ever exhausted one place. (Jolene Q4)

Jolene’s description of this “traditional use” of the forest suggests a relationship between the people and the forest. She sees the Blackfeet people’s relationship to the forest land as a balance of dependency and responsibility. The people depend on the forest for what it provides, but they have a responsibility to sustain it, along with the animals and plants within the forest. She said, “We should always take care of our forest...Without our forest we can’t have the animals... We won’t have food, the water, the forest gives us air, cleans the air.” Betty and Clyde have similar perspective to Jolene. Clyde states his perspective as “One hand feeds the other” while Betty mentions “It’s both... their dependence and that symbiotic relationship that all things in nature [share]...” Jolene expresses her perspective of how the BFC are related to Mother Earth and share a mutualistic symbiotic (Sacred) relationship with the Natural world.

“... without the animals, basically the Blackfeet Tribe...who wintered in the forest wouldn’t have been able to live if the animals weren’t there. There would have been no food. (Jolene, Q6)

A good example of the respectful relationship that the BFC had with the forest is provided by Jolene’s remembrance of how the people reverently harvested trees traditionally, i.e., the “sacred way of cutting down trees”.


“The sacred way of cutting down a tree is as you go to the tree and you pray to the tree, and you pray to Mother Earth, and you let them know what you need this wood for or what you need this tree for. And before you cut that tree down, you say your [prayer], the prayer to the Creator. You smudge. You offer tobacco. Then when you cut the tree down, you take the most little baby peanut parts on the tree and you replant them around that tree so it’ll grow back again. So you’re not taking it in foolish ways and killing it. You’re helping it continue to survive.” (Jolene, Q7)

When asked what the forests mean to the Blackfeet people, Jolene responded that the forest is a “way of life”, in that the forest provides wood to keep the people warm, food and medicinal roots, and shelter for the animals that provide food and hides to keep them warm at night. Jolene recalled a story about how the forest was created according to Blackfoot oral history, which she identified as one of the old, old man stories, i.e., stories about Napi.

Napi was tricked by the whitetail deer, and he started throwing, picking up [what] was toothpicks at the time, and throwing them at the whitetail deer. And that deer bounced all over and all over. And out of those toothpicks Napi couldn’t get him. So they grew into trees all over. The whitetail deer was part of our meat, of our heritage for pemmican and everything. So when it got too cold around the reservation, whitetail deer needed some more coverage, so he tricked Napi to throw the toothpicks, and it grew all these forests. And that’s where the deers and the antelope, the bear all went to hide when it would get really cold. (Jolene, Q8)

Jolene’s knowledge of traditional cultural practices was enriched by her taking part in traditional harvesting of roots. While she mentioned that her epistemology of the “Indian medicine way” is fading from her memory during her 23 year absence, she recalled a specific trip to a place near the Chief Mountain area where she gathered wild strawberries with Cecile Horn, a medicine woman, and her elder mentor.
“But I do remember a specific place up in the mountains where wild strawberries grew just on the other side of Chief Mountain. And I remember going there one time and picking the wild strawberries with Cecile Horn, who was a medicine woman here on the Blackfeet Tribe back then before she died. And this was quite a while ago. That we used in a ceremony, we used those [strawberries]... That’s where I learned the meaning of when you go to the forest and you’re picking the special roots for what, for the healing process we were having, for people, the face painting, the spiritual, removal of bad spirits. There was always something different in the forest that this lady knew what to pick. And she’d point out pick that one, pick that one, pick that one. But, like I said, after I left I kind of lost that, because I’ve been gone for 23 years.” (Jolene, Q9)

Given the value of the forest to the BFC for gathering plants and as the place which provides protection and hiding cover for the animals, Jolene did not think that the BFC had practiced burning to enhance hunting areas or gathering areas within their forested lands. She feels the forest was too valuable to the BFC and she mentioned that, “Usually the fires were started by thunder, lighting.” She believes prescribed burning of the forest is instead the ideology of western culture.

I don’t really believe that the Native Americans practiced traditional burning in our forests, because that’s where all the animals hid, and that was the protection of Mother Earth. The burning part come more along with, I would say with the non-natives really, because we didn’t believe in burning or hurting Mother Earth. It would be like hurting, burning your own mother if you started a fire in the forest. (Jolene, Q10)

Jolene laments that the traditional harvesting of special roots and other plant parts in the “Indian medicine way”.

Well, the traditional use of our forest, once again, if we go back to the handful of Native Americans that we do have that continued on with our culture here on the reservation, they still go up to the forest and pick these, these special roots and
berries, the pine cone. They still pick them to this day. They’re made out of certain kinds of healing medicines. That goes way, way back to our ancestors. (Jolene, Q11)

Well, a lot of the Blackfeet people have lost their heritage. We have [only] a handful of Blackfeet people who know exactly what to go get when they need to go picking their roots, their berries in their traditional times. (Jolene, Q12)

Finally, Jolene’s views about the forest and how to care for it have been shaped in part by negative experiences with poor management decisions. She recalled that certain laws set by the United States Bureau of Indian Affairs and the tribal council had had a negative impact on the people on the BIR. At one time, the BIR was rich with bison, deer, elk and berries. However, through the progress of European colonization Jolene said, “They were trying [to] annihilate us... they tried to starve us out by getting rid of our forests... But instead of that happening...we grew stronger... [Because]we already knew more about living off the land...” The European people wanted to assimilate the BFC into a European capitalistic society and in the name of progress, Jolene said, “...there were changes when we had a sawmill placed in the town of Browning.” With the promise of Native American jobs, this was short-lived and little was done to stabilize the community. She stated the “whiteman” came and told the BFC it was economically safe to harvest the timber without consideration of the cultural relationship between the BFC and the forest. They told the people they would create jobs to generate economic revenue and stability. However, only a handful of the people were employed. After the forest was logged the timber companies left without economically stabilizing the community and it was business as usual.

“They [logging industry] were clear cutting in our mountains. And our mountains were... bare. Before we used to just see nothing but tall green trees. Look up,
and they would be tall, tall, tall. And then after the big trucks and the sawmill was here and everything, you’d go up there, and there would be little stubs. ... And they didn’t take the sacred way of cutting them down. They just took a saw and cut them down. They didn’t, they didn’t realize how special the trees were. (Jolene, Q14)

These negative experiences with unsustainable practices in the forest have furthered her appreciation for the “traditional use” of forests, which promoted a respect for the forest, guarded against overharvesting, and always sought to give back, to replenish the land, so that the BFC relationship to the forest could be sustained through time.

**Jolene’s Knowledge of Whitebark Pine (WBP)**

Jolene did not have much knowledge of the Whitebark pine tree (WBP) prior to the interview. After hearing about the plight of WBP, she strongly felt that something should be done to protect and preserve the species, especially because it is a native plant of BFC traditional territory.

*I feel that someone needs to do something to stop that bug or protect these trees and keep them here in their native land, because they’re here and a part of the circle of life in all our mountains. And that’s probably something that we, as indigenous people, really shouldn’t have to lose. (Jolene, Q15)*

She believes the BFC has an obligation to see that WBP continues to thrive throughout their traditional territory, since it is “a part of their heritage”. In her perspective the BFC need to be stewards of the land and by protecting this species to allow the tree to give back to the people.

*I believe that [WBP are] part of the belief, because it goes back to the handful of ... elders here that was able to teach a lot of the Indian medicine way and the way that the trees give back to the people. There’s just a handful of people that do*
that. And then the Native Americans, we’re told you don’t leave off the reservation, you can’t do this, you can’t do that. So in time they all forgot about their, their forest lands, their traditions, not all of them but a really big portion of them. And they’re all trying to get back to it. But they, they need to be forewarned that this is happening and try to keep these things in our forest, [keep] these trees alive. (Jolene, Q16)

Views about WBP Restoration and Management in General

Jolene views of the relationship between the BFC and the forest as one of respect and responsibility, where the people take only what they need and give back with their prayers or replanting harvested species to sustain the land over time. This view of caring for the land informs her perspectives on management generally and her responses to specific management strategies to restore WBP. For example, the idea of replanting Whitebark pine as a restoration method is in line with the BFC view of giving back to the land, and practice of regenerating young individuals of the species. As she mentioned in Quote 7, “...you take the most little baby peanut parts on the tree and you replant them around that tree so it’ll grow back again”. Regarding the planting of Whitebark pine, Jolene said “I believe that’s one thing that they should do and get control of the beetles who’s killing them, the bug or whatever that’s killing them.” (Jolene, Q17)

Jolene had no reservations about selecting disease resistant seeds for growing resistant seedlings, rather she thought it was a good opportunity to utilize technology to plant genetically resistant WBP saplings. The key was that this method was natural, not man-made.

I believe that is a really good opportunity to continue to grow [WBP], because, remember, you’re starting back from the seedling where the white pine has really
grown wild. It’s not something that’s manmade. You [are] still using the white pine seeds to grow. So you’re really not changing. What you’re doing is helping this along so that our trees will stay in our area and they’ll be resistant to this. I think that’s a really good idea. (Jolene, Q18)

Jolene thinks that in the selection of disease-resistant individuals for cone collection and seed propagation, the researchers/managers are not changing the WBP, rather they are helping WBP continue to be in the forest. The effort is a method of giving back to the land, helping to replenish it, but one in line with nature.

Jolene had a similar positive view of inoculating seedlings with their symbiotic mycorrhizal fungi. In this mutually beneficial relationship, the tree transfers sugars from its photosynthesis to the mycorrhizal fungi, while the fungal extends the capacity of the roots to absorb water and nutrients. Jolene’s positive view of this process stems from her seeing it as a natural relationship in nature, and one that supports “the circle of life”.

It’s like the part of the circle of life. The tree gets the sun. The sun, it’s the part of life, gets down there. That tree feeds down, and it gives [food to] the little things down here, the fungi, ... it’s a part of this tree’s life. But it also feeds them, as the fungi feeds the tree the water. I mean, that’s just a circle of life. (Jolene, Q19)

Jolene likewise thinks it would be alright to cage WBP cones to protect them until seeds can be collected for seedlings, as long as it is going to replenish Whitebark pine communities. She seemed to have some concern that in the short term this might limit some cones from the bears and squirrels. But she supports the caging cones if over time it will allow this tree to become more plentiful, and to benefit the bears and squirrels as well, because they all ecologically connected to WBP.

I believe it would be okay to do that if this tree is going to replenish back to the earth, which is the bears, the squirrels, because they’ll all a part of this life too.
And they all generate and eat off of this tree along with this tree being nourished by the sun, the ground, Mother Earth and all the animals. (Jolene, Q20)

Similar to the restoration strategies above, she sees this caging of cones as a step in replenishing WBP to the forest. While caging of cones may not be wholly natural, not all cones are being caged, it should not interfere significantly with other animals dependent on the white bark cones.

After hearing about the relationship of Clark’s Nutcracker (CNC) to planting caches of WBP seeds, Jolene did not have any concerns about using tracking devices to study the behavior and movements of the CNC. Her main reaction was that it could be “really important for the continued life of this tree”. She understood that CNC was the essential player in the natural planting of WBP seed, and she thought it would be worthwhile to monitor the CNC if it might help the purpose of replenishing WBP.

Well, actually, what I see, it’s not better understanding the behavior and the movement of the nutcracker. The nutcracker is actually out there planting. Without him, we’re not going to be planting more of these, where he hides his seeds. They’re not going to be there if we don’t have this bird around to continue to hide them. (Jolene, Q21)

Jolene takes seriously the obligation to sustain species such as the WBP as part of the BFC cultural and natural heritage. If the species were to disappear, it would be a loss to the heritage that should be passed on to future generations. She thinks it would be unfortunate for the younger generation not to have the opportunity to “be fulfilled with the white bark pine tree and what its meanings could be”, or its continuation with the other animals and plants in the forest.

As she articulated throughout her interview, Jolene strongly believes that we should always be stewards of the forested landscape.
We should always take care of our forest. Without our forest we can’t have the animals. We’re taking their place to live. We won’t have food, the water, the forest gives us air, cleans the air. (Jolene, Q22)

And she generally supports all of the proposed restoration strategies for WBP pine communities because they can help sustain the forest and replenish WBP and the species within it.

Finally, Jolene thinks that forest managers on the Blackfeet Reservation should spend some time develop a deeper understanding of the traditional relationship that the BFC have had with the forest by “sitting down and talking to a lot of the people who are on the reservation who still have the knowledge of how important it is for our forests to the Indian people”. In addition to providing deeper understanding of the traditional uses of the forest, and tapping into the wealth of indigenous intelligence that has been gained over the centuries, it would encourage a focus on both the dependency the BFC have had on the forest, as well as the responsibility to help sustain it. Jolene would like to see this epistemology preserved for her grandchildren. She recognizes such knowledge is fading with the elders that hold it, but the younger generations should have the opportunity to learn about their cultural heritage. She thinks it would be a good idea to teach the BFC perspectives on the forest in the public schools, including the traditional role of the BFC people of being stewards of the land.

Betty

Background Information – Who Betty Crow Chief Is

Betty introduces herself a woman who grew up in Raymond, Alberta Canada. She said, it was a “Redneck Mormon town and I was raised a redneck Mormon.” Later in life she was adopted by a traditional Cree family. Her adopted mother was a medicine
woman who kept her mother’s medicine pipe and a Ghost Dance bundle. Currently, Betty is happily married to a Blood tribal member. She states:

*I’ve lived on the Blood Reserve for 15 years, married to my husband, Charlie. When I first came, I hadn’t even heard of the Horn Society growing up 40 miles away. But I’ve had the privilege of dancing at the Horn Society Sun Dance every year since I came. I was adopted.* (Betty, Q#1)

Now she also carries a powerful Blackfoot name her late mother-in-law gave to her husband before he was 16. This name was based on a vision, she told Betty’s husband to bestow it on someone who “was kind to him in later years.” Betty is a recovering alcoholic and said “…the best part of my recovery was embracing and understanding native spirituality.” She is not proud of her European roots and thinks their perspective of utilizing the land is not very healthy, an issue addressed in more depth in the following sections.

*Betty’s Worldview and Perspectives on Indigenous Epistemology*  
Betty has gathered a combination of western and BFC worldviews developed through her direct experience of having to survive in both worlds. She believes her European cultural roots generate a very different spiritual and environmental worldview than do her Native cultural roots. One major point of tension she identifies is the native concern for unison, inter-relationships, and “the next seven generations” versus the European’s selfish concern with themselves and how much they can acquire during their own lifetime.

*And I’m ashamed of my European roots, the inattentiveness to people coming to this land of abundance without weighing the outcome of their choices and actions for seven generations to come. I believe so strongly everything we do we have to*
consider seven generations to come. And my [European] ancestors didn’t. They came and they grabbed without an eye to the consequences. And it’s continuing around the world today. (Betty, Q2)

She thinks that the European heritage of selfishness comes from the hierarchical and unbalanced character of European society.

Most of the people who came from Europe were peasants. And they had been servants to the lords and ladies and rich people and queens and kings. ... the rich people ... had their parties and their fancy balls and ... all of that. And the peasants struggled to survive. And ... they got taxed so bad their kids would starve to death before winter was over. (Betty, Q3)

Betty’s view is that the peasant people from Europe were fleeing their own people to a new land full of “milk and honey.” In coming to North America they found:

... a people who don’t have the language, who don’t have tables and chairs and knives and forks and maybe a flintlock or whatever. ... And so they come with a sense of power. I’m not a peasant anymore. Now I’m the one in power so I can do to these people what was done to my family for generations until I got to this land. Now I’ll be the one in charge. And I’ll grab and grub and put on airs and have every comfort and have people working for me. And so they started trading and they started chopping trees and farming and selling their goods and by then the industrial revolution was on in Europe. And so they were building factories and not thinking at all. (Betty, Q4)

In contrast, she states that her Native cultural heritage leads to a belief system where there is not the kind of hierarchy that leads to such a selfish and destructive worldview.

...in my belief system there is no hierarchy, but there are leaders. ... nothing in existence is more than something else. (Betty, Q5)

Betty credits her Cree mother for teaching her “what humility is” and the “grace of being strict [in raising children in the appropriate way].” Her Cree mother raised 12
children, and though most of them are university educated and have Master’s degrees, she also taught them the “practice the old ways [and] she showed them ... the cherishing and value of that.” Much of Betty’s BFC knowledge stems from her husband Charley who, “…is a great historian, a great naturalist, a great hunter, a great horseman, modern technology. He’s an electrician, a carpenter, a mechanic.” Betty mentioned her husband may not be a computer genius. But he shares “a lot of old stories with me when the time is appropriate.”

Betty’s reference to humility in the paragraph above is important to understanding her statement that “there is no hierarchy” in Quote 5. As the quotes below convey, when she made the statement that there is no hierarchy, Betty was referring to inhabitants of the world (including humans, plants, and animals). Overall these inhabitants, though, she believes that nature (or put in spiritual terms, the Maker) is in control.

*I firmly believe nature is in control of all things natural. Spiritually I would say the Maker knows what’s happening, and we have to learn something from it.*

(Betty Q6)

*It’s both, you know, their dependence and that symbiotic relationship that all things in nature, except humans, have. Maybe the grizzlies will genetically alter over time to compensate just as part of evolution for . . . If nature needs grizzly bears seven generations from now, nature will take care of it. ... the arrogance of humanity. We are the most dispensable life form on this earth as far as keeping nature in balance. And maybe we’ll become extinct, and then everything can get back to how it’s supposed to be.*  

(Betty, Q7)

Betty believes that “all things exist for a reason” and that the BFC and Cree cultural roots led them to perceive themselves as part of a larger complexity of interdependent relationships with nature instead of being a separate unaffected entity.
She felt these native cultures understood the importance of togetherness and working as a 
team to strengthen their productivity in sustainable ways to ensure their survival as a 
people connected intimately to Mother nature.

*It wasn’t about money or one upmanship. It was about unison with nature, not 
having any kind of class hierarchy or any of that. And everybody ... cooperated 
with each other and acknowledged the strengths of each individual so that they 
could be most productive in their strongest area and to acknowledge those 
strengths in other aspects of nature, that they could be most productive in their 
reason for existing. They weren’t all put here for us to destroy but to be in 
unison. I’ll share my prayers. I’ll share my tobacco. I’ll share my smudge. I’ll 
sing your song. And the universe will know how I honor and respect and love you 
and understand that in order to survive ... I’ll need a small part of that life force. 
But I’ll leave the rest to continue for future generations.* (Betty, Q8)

*...there was a thoughtfulness behind anything we took from nature. A prayer 
before, a song of that plant, that animal. We’d sing their song and beg for their 
help and pray to them and acknowledge their beauty and their essence and I need 
you for my family, I need you for my survival. Are you willing to sacrifice 
yourself so my children can eat, so my children can have shelter...* (Betty, Q9)

As the quotes above suggest, she felt that it was important to respect the 
connection between people and other members of the natural world through prayer, gifts, 
and singing songs of happiness and gratitude. But her comments indicate that the need 
for prayer and appropriate spiritual practice goes beyond simply thoughtfulness; these 
spiritual practices are necessary to receive appropriate guidance.

*The universe has all the wisdom. And whatever I decide, I better pray hard and 
be guided before I act, because my judgment always has a prejudice attached to 
it. Always.* (Betty, Q10)
INTERVIEWER: If you had any … advice for … forest managers or people who are taking care of Blackfoot traditional land … whether they’re native or nonnative that are taking care of the forest … what would it be? BETTY: Pay attention. Pray hard and listen. Pay attention to the answer. Nature will show you. … The old people that walked this land 5,000 years ago will show you. Better than science. And science might be part of the answer. But the old people will tell you, because they knew how to listen. And if you’re sincere and you’re asking, you’ll know how to listen … (Betty, Q11)

Thus, Betty thinks future managers should not only try to work in collaboration with Nature, she also believes managers should listen to Mother nature to find the solutions they are looking for. While her comment in Quote 11 acknowledges that science may play a role, she believes that developing a spiritual connection and personal relationship with the land is a key component, one better than science as practiced in European culture. So, in the end, Betty looks for answers to come from nature acquired through an appropriately spiritual epistemology rather than from European culture guided by scientific epistemology.

... my bottom line is scientists do not know better than nature. ... I don’t like science intervening with nature. (Betty, Q12)

The white man comes up to the Indian and he says how. … if my [European] ancestors had … listened to the answer, we wouldn’t have these problems. But [instead of listening] they said we know more than you. We can write our names. We can record history with pen and ink. We know more than you. Because you’re different, you’re lesser. And [the Europeans] shamed and degraded and exploited. … And today I don’t think there’s a human alive can answer how except through prayer and really listening hard for the answer. I don’t think science has the answer. I know nature does. And I hope humans are included in
the equation, because we are dispensable. And if somebody came in my house and wrecked it, like we’ve wrecked nature in the past 400 years, I’d get rid of them. (Betty, Q13)

Humans aren’t smarter than nature. That’s my bottom line. All the good intentions in the world can’t correct the harm we’ve done, can’t eliminate the harm we’ve done. And a last-ditch effort at correction when they’re on the verge of extinction ... I have a hard time with it, because maybe nature’s got some other plan. Maybe, I think the mountains are forever. I hope the mountains are forever, and nature will take care of the harm we’ve done. (Betty, Q14)

**Betty’s Knowledge of WBP**

Betty was unaware of the decline of WBP populations due to WBPR, MPB, fire suppression and human induced climate change. She also stated that she was not familiar with how the BFC had traditionally used WBP. However, she did have an interesting perspective on the role of WBP in nature. In response to a question from me about why older BFC members in the Browning area described WBP as being like an elder, Betty said:

... it’s at the beginning. ... And we, in my belief system there is no hierarchy, but there are leaders. INTERVIEWER: Oh. So it’s like a leader. BETTY: ... No, nothing, nothing in existence is more than something else. But there is a primary position of strength and wisdom and utility. It is the first, because if there was erosion at the highest place on the mountains, I was going to say it will snowball. ... Whatever’s at the highest has to be the strongest to prevent avalanches. And this tree, as it controls the snowmelt and the flow of water and prevents erosion protects all those ... that are behind it on that, that mountain height. And its longevity speaks to its strength. And the interaction with Clark's nutcracker speaks to the ingenuity of its existence, the reason and purpose and how all those at lower elevations are so reliant on it, its existence. If it becomes extinct, then what's going to hold back that snowmelt? What’s going to hold back that soil?
... What’s going to prevent the landslides and avalanches and floods? It’s, it’s too bad we take so long to understand the harm and damage we’re doing. And perhaps mankind does have a responsibility to nature to ... correct our own mistake... (Betty, Q15)

The last statement of Quote 15 hints at the fundamental tensions Betty feels when faced with questions about humans seeking to intervene in the management of natural processes. The tension between letting nature take its course versus the need for management from Betty’s perspective, as well as her views about acceptable forms of management are addressed in detail below.

Views about WBP Restoration and Management in General
Betty described the BFC as a society who, historically, was selective and mindful of harvesting; doing so in a thoughtful way that reflected an awareness of the role of plants and animals in nature (see for example Quote 15) and a way that thought about the future (thinking seven generations out, see Quote 2). The BFC knew regeneration was a vital component to their livelihood and it is cherished, respected, and a key element for the continuation of their people. The concept of replenishing resources through regeneration is so important to the BFC that it can be found in much of their oral history. This idea can also be represented by historical stories with female characters who are pregnant and are saved from destruction because they are going to reproduce and restore the species.

But there was never a ... ‘okay, we’re going to go get teepee poles, let’s just go clear-cut this area so we’ve all got a teepee.’ It was very selective and always more left behind than was taken. Picking berries. Leave some for the birds. Leave some to regenerate seeds. Don’t take them all. And the Napi stories, there’s always, always a pregnant gopher, a pregnant this, a pregnant that.
Begged for her life because she was pregnant and was left to survive for future generations. (Betty, Q16)

Betty believed that this approach had historically allowed for the land to be highly productive and pristine. Betty thought that is why, when the Europeans came, they thought this was virgin land.

And that’s why when the Europeans came here [they thought] all this [is] virgin land. And they didn’t understand this virgin land had been utilized for thousands of years by people who understood the value of what the land held and didn’t try to change it. [The BFC] flowed with nature instead of trying to push nature to the side for their greed, for their comfort. It was always a request. It wasn’t a grab and run. And always with consideration of future generations of trees, of birds, of bears surviving to live in balance with humanity. (Betty, Q17)

Thus Betty described an historical relationship in which Native people understood the connectedness between humankind and nature. In this case the Natives were not controlling over nature but lived in unison with nature. On the other hand, she thought the European people just saw a vast pristine land base and thought it was theirs for the taking:

They came and they grabbed without an eye to the consequences. And it’s continuing around the world today. (Betty, Q18)

So Betty accepts that the European approach has created an imbalance and that the world she describes above no longer quite exists. She laments that it took so long for Europeans to recognize the environmental damage they caused (see Quote 15). When made aware that WBP, for instance, has been endangered through human action she responds:

“We have an obligation to protect it for sure like we have an obligation to protect all living things. I can’t say I really have an opinion about how far. It’s more a responsibility than an obligation. (Betty, Q19)
... we’ve overpopulated and exploited nature so much for material comfort and material gain. We do hold a responsibility to somehow correcting the harm done by that exploitation. (Betty, Q20)

But she also describes the character and degree of human intervention as a question “I’m avoiding answering.” And later she asks “and how far is that human control going to attempt to go?” Thus, her belief that humans have a responsibility to correct the damage they have created exists in tension with her belief that what happens is up to nature (or expressed spiritually it is up to the Maker).

It’s up to nature. It’s up to the Maker. It’s up to how can we protect it now that the disease is here. (Betty Q21) (See also Quote 6, 7, 14, 15)

Faced with this paradox, Betty reasons through each of the proposed WBP management recommendations I presented to her in the interview somewhat differently.

When asked about replanting WBP she states:

There’s no point in planting it unless we destroy the fungus [WPBR], because it’s kind of like I’ll bring an alcoholic into my home to have shelter and food and they’ll stay an alcoholic as long as they can have the alcohol come to them where they’re getting shelter and food. If we replant the pine without eliminating the fungus, we’re giving it a premature death sentence. (Betty, Q22)

When asked about genetically modifying WBP to protect it from blister rust she responds:

Humans aren’t smarter than nature. They can go ahead and do it. You think the fungus won’t modify itself to be stronger, better able to attack [and] resist? It’s part of the cycle. If the fungus is present, it will modify itself, because its goal is to destroy. And it doesn’t need human interference to prevent it. And my understanding, fungus grows a heck of a lot faster than trees. (Betty, Q23)

When asked about using radio devices to track CNC’s she responds:
Oh, you’ve got a hard job. It always comes back to nature knows what’s happening. And Mother Nature can correct the follies of humans with or without a tracking device. I’m grateful for the conscience that wants to do the work. And I don’t know. The scientists are given this knowledge for a reason too. But it might be okay to know more about the bird if the tracking device is noninvasive. But then are they going to start being genetically selective about the birds? And how far is that human control going to attempt to go? (Betty, Q24)

So Betty is most receptive the management approach which represents an attempt to understand nature (tracking the CNC in order to understand its role in naturally regenerating WBP). So long as this is not invasive, she suggests this attempt to understand nature may be a good idea. However, she wonders if scientists will want to begin to be genetically modifying the CNC, worrying, then, that this could possibly turn into a human attempt to control nature (her reason for being skeptical for about genetically modifying WBP see Quote 23). Betty feels human desire for control is ultimately one of the causes of the degradation of Nature. She has a difficult time with the idea that humankind has to be in control instead of realizing and trusting Mother Nature’s plans for the future.

Humans aren’t smarter than nature. That’s my bottom line. All the good intentions in the world can’t correct the harm we’ve done, can’t eliminate the harm we’ve done. And a last-ditch effort at correction when they’re on the verge of extinction, I have a hard time with it. I have a hard time with it, because maybe nature’s got some other plan. Maybe, I think the mountains are forever. I hope the mountains are forever, and nature will take care of the harm we’ve done. (Betty, Q25)

Her rejection of most proposed management actions seems to imply that these solutions comes from the wrong source – they reflect an inadequate scientific
epistemology rather than a more appropriate spiritually based epistemology underlying the historical native cultural view (see Quotes 13, 10, 11).

**Clyde**

*Background information – Who Clyde is*

Clyde introduces himself as “originally [being] from Browning, Montana...I’m 60 years old...and an enrolled Blackfeet tribal member of Montana.” Clyde grew up around the Divide Mountain area which is North West from the Star School Community where Clyde resided. The Star School community is located north of Browning Montana on the Blackfeet Indian Reservation. He is the son of Katie Cross Guns who is the daughter of George Cross Guns. Clyde’s grandfather George Cross Guns is the son of White Calf who was the last official chief of the Blackfeet Tribe. White Calf passed away in Washington D.C. in 1903. Clyde’s father is Vincent Pepion who is the son of Mabel Davis and Chester Pepion. On Clyde’s Pepion side of the family he descends from the great Blackfeet Mountain Chief Band which was involved in the historic eradication of Blackfeet tribal members known as the Baker Massacre or Bear River Massacre. Mountain Chief and his band were slaughtered by Colonel Baker and his troops on January 23, 1870. During this one sided battle some 200 BFC members mainly women and children were killed. This event once was described by one company commander as “the greatest slaughter of Indians ever made by the U.S. troops”

“My parents, my mother’s name was Katie Cross Guns. She’s the daughter of George Cross Guns who’s the son of Cross Guns who was the son of White Calf, the last official chief of the Blackfeet who died in 1903 in Washington, D.C. My father’s name was Vincent Pepion, [who] is the son of Mabel Davis and Chester Pepion. The Pepion side of the family, also making me a descendant of Mountain...
Chief, the one that was Colonel Baker was after [inaudible] and his band on the Marias River.” (Clyde Q1)

Clyde’s Perspectives on Indigenous Epistemology
Clyde thinks it is a good idea to go back to Indigenous Epistemology. He thinks it is a good idea to gather information from the very people who have habited the land one seeks to restore. There may be some confusion about the North America Indian and Clyde doesn’t believe in the theory that his people walked across a land bridge. Rather he believes that his people have been here from time immemorial. His people have the oral history, language, ceremonies and knowledge to prove their native existence which is rooted throughout their Traditional Territory.

“I think it’s, if you’re going back to the North American Indian, especially the Blackfeet Tribe and you going to the Blackfoot Confederacy, I think Canada, we actually are the, we are native to this land, just as the plant was, barring all these other arguments about the Asian bridge, the Asian gap coming in from Siberia. I don’t really believe that.” (Clyde Q2)

Clyde believes there is much Indigenous knowledge associated with the WBP and he thinks there is a need to, “...incorporate the knowledge from the native’s perspective, the spiritual perspective, the cultural uses of this plant, [and] what we used it for.”

Clyde only hopes the Indigenous knowledge of WBP has not been totally forgotten. He feels it is important to collect the Indigenous Epistemology of WBP because it is one way of preserving and protecting it. He also thinks is it important to learn the BFC cultural uses of WBP and understand their relationship. The relationship between the BFC and WBP is important because it has knowledge which teaches the BFC how to survive in the future.
However, Clyde is very cautious pertaining to the collection of WBP information and he hopes that the information gathered pertaining to WBP is based on truth and fact. Clyde and Clarence, share similar concerns, and believe that…A person should not make up a story for the sake of telling a story. At the same time people, should not depend solely on written literature as validation that such information is true and based on the facts. Betty shared a similar believe as well which she explains as Nature knows best and better than science. All three participants’ concerns are important to mention because misinformation can result in communication barriers and the misunderstanding of the relationship between the BFC and declining WBP ecosystem.

“...like this white bark pine, I think a lot of that knowledge that the natives at once possessed is actually diminished. And I’m hoping it didn’t diminish to the point where it’s gone forever.” (Clyde Q4)

“That the information that you do get from the cultural perspective, that it’s real, that it’s based on truth and fact. Sometimes you rip out a page out of a book. You try to put the information back into that book, but what you do is actually you lost it, so you make it up. I’m hoping that there’s people out there that know the genuine uses of the tree, more, not only from the standpoint of the spiritual aspect but more from the real natural benefits of this tree, to keep life alive like the bird, the bear and those animals that depend on this tree and the water and . . . I really think that’s the important thing about it.” (Clyde Q5)

Clyde’s knowledge of WBP in relationship the BFC
Clyde felt the BFC have a responsibility to assist in WBP restoration and see to it that is continues to thrive throughout their Traditional Territory. He thought that if all the BFC knew about WBP and its current declining status it would devastate them as a people. The BFC take great pride in their philosophy that all things are interrelated and
dependent on each other in order to survive and function as a whole. WBP pine is a prime example of BFC worldview in that it is connected to many other aspects of high mountain ecological systems including other trees, water, and animals. Clyde thinks it is of great importance to preserve and WBP is related to the very air which humanity breaths. He believes people need to try to preserve WBP but at the same time come to a better understanding of this why it is dying at such fast rates.

“As much as an obligation as more less as a right, responsibility, I believe that’s what exists for the Blackfeet people. But knowing the Blackfeet people, they would, if they had the information that this tree was actually disappearing, I believe that the consensus would be one of sadness, one of deep concern. Knowing the Blackfeet people, that all things need each other in the circle of life, that we’re all dependent on each other, even the trees, the water, the animals, the environment, the air, the people. Yes, I think it’s of great importance to try to preserve it, try to understand why it’s being wiped out...” (Clyde Q6)

“...it’s all that circle of life. It’s everything relying on one another. And once that’s broke, as small as it seems, this tree is almost like it’s unimportant, insignificant. The impact for us is like it’s scary. And so if you start losing something and it affects your water, and the water we don’t get, the pure water, then the people are going to get affected.” (Clyde Q7)

Clyde understands the importance of WBP and its relationship to watershed dynamics. He believes the relationship they share is very significant to high quality water for the BFC who reside at the foothills of the. The BFC has the headwaters which also feed numerous plans and animal along with supplying ranchers and farmers through Montana and Canada. Water distribution is an important issue for the BFC and anything that works to preserve it should be implemented.
“I think anything in that, anything that works to try to preserve it I think should be undertaken. I think the importance like you pointed out, the watershed that actually purifies the snow to give us clean water for those of us that live at the foothills of the mountains, and all things live off this water, the animals and trees all of us depend on. And the watershed being for the mountains, it affects everybody that lives in and near the mountains of Montana, because the water from that watershed goes all the way down, all over through Montana and through Canada also.” (Clyde Q8)

At first Clyde was unfamiliar with WBP and never was aware that it was on the brink of extinction. He said, “I really wasn’t aware that it was on the verge of becoming extinct... even the name, white bark pine, the name was really unfamiliar.” Although after Clyde saw a photo of WBP and examined a live branch taken from WBP he realized he does know this tree and where is grows. “...when I see the picture of the tree and actually see the branches, I know where this tree’s at.” Clyde has observed WBP communities located on Divide Mountain of the Blackfeet Indian Reservation. He spent a lot of time the mountains where WBP is located while he harvested firewood, corral rails, fished and fought Wildland forest fires. “I’ve been up and through the mountains numerous times getting wood, getting trees, hunting, fishing, firefighting on Divide.”

Clyde spent numerous years in the BFC Mountains some of which are now known as Glacier National Park Mountains. Clyde has adventured into the Rising Wolf Mountain area while experiencing the Upper Two Medicine Lake and north of there he would also visit the St. Mary’s Lake area. He enjoys travel the beautiful Glacier Park tourist attraction knows as Going-to-the-Sun High way. This highway takes visitors from all over the world on a wild and scenic trip from West Glacier over the eastside of the Rocky mountain range out on to the plains of the Blackfeet Indian Reservation.
“Also going up into the park all the years of my life, going up into Rising Wolf Mountain, Upper Two Medicine Lake down through St. Mary’s and going over the Going-to-the-Sun Highway all them years. And that’s, that’s a lot of years.”

(Clyde Q9)

Throughout Clyde’s many years of being in these Mountain areas he remembers observing WBP. He was not very impressed with the tree as it was not very attractive to him. He thought it was not a very pretty tree and that’s why he never remembered it because he never really paid much attention to it. He was more interested in tree species of Engelmann Spruce, Douglas fir and cedar. However, after Clyde learned how WBP, though unattractive crooked; stunted; and wind swept, serves as a mountain ecological Keystone species he was fascinated by WBP. He immediately felt sorrow and great concern for this not so aesthetically pleasing tree and its current declining status. It is devastating to Clyde knowing WBP once thrived throughout his homelands but now is a native species declining at fast rates.

“I remember this tree. I remember it to be not a very, not a very pretty tree. Maybe that’s why I didn’t really recognize it so much. More into the spruce, Douglas fir, and those cedar trees. But this tree, I didn’t know the importance of it until you kind of give me some of its characteristics. And it’s actually sad to know that something where I live surrounding Glacier National Park is becoming extinct. Very disheartening.” (Clyde Q10)

View about WBP Restoration and Management in General
Clyde did not know what to think about the idea of genetically modifying WBP. He said, “I don’t know. I got mixed feelings on science and technology, man’s interference and man’s intervention on a part.” Clyde and Betty share similar perspectives in this regard. Both do not fully seem to trust in humanity’s interference with the natural order of the environment. Clyde thinks “Man’s attempt is good” or may
have good intentions but that does not mean it is the right thing to intervene between Nature and the natural process of life. “Now what I’m hoping for is that their knowledge is to balance out the adverse effects of the, is a genetically engineered tree that’s going to be immune from different diseases that trees get. But is it still going to be the white bark pine tree?” He wonders if the human genetic tinkering of WPB trees really is the best idea and said, “But if it’s still the same tree, I’m all for it.”

However he still thinks man’s attempt to find genetically resistant WPB may have larger impacts in the future that will cause further environmental degradation. While Betty thinks planting WBP is a premature death for WBP because it is still in a diseased environment. Her thoughts were “There’s no point in planting it unless we destroy the fungus [WPBR].” She like Clyde and Clarence thinks genetic tinkering is dangerous in a way and that Nature knows best. While Clarence states, “Looking at it...from my perspective if you start changing the makeup, the originality of some living thing, somewhere down the line you’re going to forget something.” Clyde thinks that if you do not find the natural way to get rid of the fungus and instead try to create a genetic resistance WBP tree that is not resistance to its other natural adaptations such as cold climate then it is “…going to be a genetically different type of tree…” In this case, “…you’re actually defeating the purpose, trying to save a tree that you may be helping to cause further extinction of that tree and what you now raise is a genetically engineered tree. So the white bark pine in that way is gone.” (Clyde Q11)

Clyde supports the idea of inoculating WBP roots with micorrhizae fungi as a method to enhance its changes for survival after being artificially planted. He thinks it is a good idea because it fits with the BFC philosophy in that all thinks are related and
depend on each other for their survival. On this case with the fungi is going to help supple the WBP tree with added water and nutrients increasing its survival rate then Clyde believe it should be implemented.

“I think it kind of reflects back to the answer I just give. But, again, it’s like the partnership in the environment. It’s one thing helping another to preserve its, that different type of species. And, again, I think if it’s, that’s what it’s going to take to bring this tree back, then all good and well. It should, it should be done.” (Clyde Q12)

Clyde thinks the CNC share a close relationship with WBP and is capable of replanting WBP successfully. He thought “…there’s something missing. There’s an unknown factor that those people that are the technicians, the scientists haven’t yet discovered. And with the birds you’re talking about, yeah, that partnership.” He has observed the CNC and knows they are around in the WBP habitat and he remembers “…he’s not afraid of humans.” Floyd used to feed the CNC pieces of his sandwich when we was having lunch while out working in the timber. Clyde, “actually seen this bird a lot of times...[CNC] is like camp robber...especially fighting fires there when you’re in the camps, he’s [CNC] all over the place.” Floyd also mentioned the CNC being like the camp robber but he said the CNC is not the camp robber. Floyd said the Camp robber has blue wings.

Clyde thinks the CNC is pretty good sized bird and “his partnership in trying to preserve this tree by collecting the seeds and dispersing them...it seems like wherever he plants them, they grow...” Clyde supports the idea of radio tracking the CNC as a method to “…tracking him down to see what his behavior is that causes those [WBP] to grow…” Clyde thought the CNC does something extra unique in preparing WBP seeds for plantation and said, “…maybe the enzyme inside the stomach of the gullet or where he
stores the seed may have some kind of an impact assisting the white bark pine to grow.”

He thought it could possibly be a part of the missing link and a reason why artificial plantations are often unsuccessful.

Interestingly Clyde, like Pauline thinks the other environmental factors causing high WBP morality is important to understand because the decline of one species is an indication forewarning us of future environmental changes. Pauline thinks the MPB is forewarning us that respiratory infections are coming while Clyde wonders, “... is the global warming is causing these trees to die from these different diseases, that they’re not resistant to certain type of diseases... is it coming from the air...Is it pollutants...in the rain? Is there acid...something caused this.” On the one hand something is causing the extinction of WBP but on the other hand, Nature is also trying to tell humanity to be prepared for what is to come.

Clyde thought the strategy of bagging WBP cones as a restorative method if it is successful is a good idea. He believes humanity usually waits to long to attend to critical phenomena’s and when they do recognize they need to intervene it is almost too late. He mentions, “...man usually waits almost ‘til the last minute. And by the time they get active and try to get into intervention, prevention, the sickness may have gone to a point where it cannot be stopped.” Betty has a similar perspective and states, “All the good intention in the world can’t correct the harm we’ve done, can’t eliminate the harm we’ve done. And a last-ditch effort at correcting [our mistakes]... [is]... when they’re on the verge of extinction...” Clyde felt that WBP rust may have reached a point to where nothing is going to prevent it from WBP destruction. At the same time Clyde has great hopes that this method does work and it should be conducted to save this tree. He thinks,
“...it’s a crisis area, so whatever it takes to get it saved... needs to be done” to see that WBP continues to thrive throughout the BFC Tradition Territory.

In conclusion Clyde wishes future forest managers will work together both Native American and Western societies. He has a vision of them “Work[ing] together in harmony... eyeball to eyeball” and soon they will realize the magnitude of their preservation responsibilities. Furthermore, both entities need to come to the self-realization they too are interrelated and share a connected responsibility to preserve natural resources and a whole. Clyde felt it is a part of the circle of life to equally treat Western science and Indigenous science as both creditable ways of knowing.

“...they’ve got a really important job to try to preserve a species...it is of the utmost importance to try to preserve this tree, the animals and trees are assisting us to live because one hand feeds another within our environment as these animals and these trees are working together to live” (Clyde 13)

**Floyd**

*Background Information – Floyd Middle Rider*

Floyd introduces himself as being born on the Blackfeet Indian Reservation, originally to the proud parents of Richard Little Dog and Louise Spotted Bear/Little Dog. Before he turned 2 years old, he was adopted by Old Man and Old Lady Middle Rider, because they did not have any children of their own.

Floyd has lived on the Blackfeet Indian Reservation most all of his life, except for a period of about 19 years that he worked over in the Flathead Valley for the Flathead National Forest. He had taken that job “over the mountains” after his first year of high school in Browning. But as his work assignments changed and he needed further training, he went to Blackfeet Community College for four years and received an AAS degree in land and road surveying. That training helped him in setting up timber sale projects.
When a position came open with the Bureau of Indian Affairs in Browning, Floyd applied and received a job with the BIA Blackfeet Agency Forestry Department. All together Floyd’s government forestry employment included 37 years of service.

**Floyd’s Perspectives on Indigenous Epistemology**

As Floyd grew up on the Blackfeet Reservation, he was mentored in traditional cultural practices by his adoptive parents, Old Lady and Old Man Middle Rider. Floyd remembers learning from the old people how to harvest WBP needles for use in incense. The needles were collected only from short stunted white bark pine trees found at higher elevations near tree line, and not from taller trees growing at lower elevations. Even today Floyd’s family still uses needles from high elevation WBP for incense.

*Well, we found out that up on the higher elevation this whitebark is really stunted. It’s where we learned from the old people, pick the needles off of it and use it for incense...* We were way up above 5,000 feet I think, or pretty close in there. And that’s why they were stunted. And they’re pretty short, limby and long needles... *Right there is where you pick it. It grows about four, five feet high and that’s just like that’s all it grows. Then you can pick out the needles on it.*

*...That’s for the incense when we do the smudges and all that, that we use them. We use different ones, too, like, like there’s some Doug fir. They kind of grow there something like this white bark, but they are Doug fir. We take the needles off of there. And them’s ones that they call the sweet pine.* (Floyd, Q1)

Floyd recalled that his family also collected other plants as well for various purposes, such as licorice root to boil as a tea for colds, and chokecherry bark that was boiled for soothing sore throat. “They boil them barks” Floyd recalled, though “that’s
something that [he] never really got into though was [knowing] all the roots, you know, and the medicine”. Still he recalled that licorice roots the “old people” used sage to cure distemper in horses.

> And sage, we’d use that sage for cleansing when we have our smudges. Then I remember the old people, those horses that get a distemper, they used to put something over the top of their heads and they'd put that, they’d burn that sage there and that smoke and make those horses inhale it. All that stuff just comes out of them. (Floyd, Q2)

Floyd expressed a deep respect for the knowledge passed along from the older people, and seemed to regret that he had not been able to remember or record more of the old knowledge and stories. He mentioned that the old people had told him some ways to predict the weather from observing plants and animals.

> Floyd: Well, what they went by was, if there was really abundance of berries, there might be a early winter. And if the squirrels were storing their cones on the ground under the fallen tree, it wasn’t going to be a bad winter. But when they start putting up higher, up on the trees, they’re going to have a bad winter. And a muskrat, when they build those little feeding places out in the pond, if they’re way out in the middle, it’s going to be a bad winter, that it’s going to be pretty cold, because if they put that feeding spot close to the shore, they won’t be able to get to it, because it’ll be frozen out that far. And they have tunnels from the shore bank to swim out to that one that’s way out there in the middle to feed. So that’s what the old people are telling me about that. (Floyd, Q3)
Floyd seemed to miss the old people and mentioned that as a boy he would lie awake and listen to the stories being told by the adults as he fell asleep.

And there was a lot of things that the old people, you know, I wished I’d [remembered], especially the stories a long time ago that . . . I was pretty small. I used to just lay there and listen. I’d fall asleep. If we’d a had these [tape recorders], that would have been great. Could have got the really good stories. It was just the tail end of what was really going on about the old people a long time ago. But it’s like I said, if we’d of had these [recorders], we could of really got some good stories, but we were small and didn’t know. (Floyd, Q4)

One of the stories that Floyd remembered was related to the grizzly bear and how it might help people.

All I’ve learned was, I don’t know, but certain medicine pipes, I guess maybe, mostly from what I hear is that any one of those, mostly those medicine pipes, they forbid, forbid you from even touching a bear skin or step on their tracks or be involved in any way like for, you know, hunting or something.

In some ways that bear did help some people. Yeah. You know, they killed some people, but some ways maybe another bear will help a certain person like an old story, that these men were out were on a raid someplace. I don’t know what they were doing, you know, take some horses from another tribe, and one of the men broke his leg some way. So he put a shelter there, and then his partner said well, just stay in here. They had some meat or something that he could be living on while the partner was gone. Might have been dry meat. And his partner left.
When he left, a bear came. And he couldn’t defend himself because his leg was broke or, so he just prayed to that bear. And that bear come in there and was attacking him but wasn’t chewing on him or anything. He was just throwing him all over, around. And that bear left again. Then it come back again. Did the same thing. Meantime, he was praying to it. And I don’t know what, how many times he did that, the bear. Then his friend didn’t quite, I don’t know if he made it, tried to make it back or what happened to him. But anyway, this bear licked is wounds and healed his leg. And then he had dreams about the bear, you know, talking to him and telling him something. I don’t know what it was. But anyway, that bear told him in his dreams I don’t know what day it was, but anyway, he told him he says I’m going to take you home. So one day that bear come back, backed up to him and looked at him and then he figured well, this is what that dream was about. So he got on that bear’s back and took him. I don’t know which tribe it was, but, you know, took him home. So that made him his power. So that bear was his power. (Floyd, Q5)

Floyd described how people would leave gift for the spirits by putting presents in the trees, to help maintain a spiritual connection or relationship between the BFC and their forests.

“Well, even the, the tribe up from the north of the border all come down there and have ceremonies up there and that, below there where they camp. And there’s a lot of offerings around there. And I’ve seen some down on, close to the highway down there. I could tell those were original ones. And then I happened to find two of them over there that, where we were going to log, put up a log and say a, and then I inquired about what we should do. I went over and asked George
Kicking Woman about, about that. He just told me, he says well, just don’t log close to it so those trees don’t fall on it."

“It, it could be from here too. It could be. And I, right now, right now the way I see it is on the north side of the border them were really involved in all that stuff like, LIKE those, those gifts. They, they make a promise that maybe they have a family that’s sick or, and they put that gift out for that help, to help that family member to get well.”

“Uh-huh, yeah, yeah. Then they go up there, do a sweat, and they fast for four days, sweat. Sometimes they might, they might have a dream to help them out. Spirit might come by and help them. Will tell them, they might ask for something, and then that spirit might tell them what to do, what he needs to do to get that help. For instance, that spirit might say well, that certain medicine pipe, you go put up a feast to it and have a, whoever was sick or something like that, go over there and give them a gift and get painted.” (Floyd, Q6)

What Floyd Knew About Whitebark Pine
Floyd thought WBP would not be economically feasible unless maybe you could get 16 feet out of it. He thought WBP was similar to LP and he said:

“And it grows different. You know, I was over the mountains down there, they had some big trees there. And they were pretty straight. There’s, something like around here, they die out on the top. But the rest is still good.” (Floyd, Q7)

Floyd never knew how WBP stands naturally reproduced until I shared the ecological story with him about WBP regeneration conducted by the CNC. He called this “The bird that picks up the cone.” He has probably seen this bird before in the mountains and he thinks there is another name for the CNC. For example, “the Blue Bird” is referred to as the Camp-robber. It has blue wings and CNC looks like it might be related to the Camp-robber but he does not think CNC is the Camp-robber. He thinks the Camp-
robber is the Blue Bird or has Blue wings. He remembers seeing the camp-robber when he was working in the mountains and during lunch time this bird would be there by them. It would come very close and Floyd would feed it some of his sandwich. Floyd said “And that is why we called them the “camp-robbers.”

I’ve probably seen, I’ve seen all kinds of birds around, but I didn’t know what they were. There was probably some other name for, for instance, like that bluebird that was a camp robber, all I knew about that one was just being a camp robber. (Floyd, Q8)

Views about WBP Restoration and Management in General
“Well, it’s good to start planting trees. It will provide for employment and that will be good for bringing the trees back.” “If it’s possible, we should do that. Yeah, and not just depend on that bird, you know.” “Well, that’d be, I think it’d do both good to plant that and let that bird take its course, because that’s nature’s way of doing a lot of things around that we learn. What we’re learning nowadays is the people are experiencing, doing some experiment on what’s happening on a lot of the trees that we are, we have just finding out how they’re producing. And that bird, you said there could put, what was it, a radio collar on it or something?” (Floyd, Q9)

Ecologically Floyd things researchers should look into the CNC’s relationship with WBP regeneration. He thinks there should be a way to get the seeds and plant them.

“See, I think that’ll be okay, because they’re experimenting, see. There, and if that works, well, you know, kind of help along, we could help along by planting those seeds too.” “Yeah, that’s the only thing I know about that white bark pine was there’s some of it can be long. But then all the stunted ones, we get way up higher where they’re, you know, they were just all crooked, you know. And we pick their needless off of them, then we use them for incense.”
“Well, I think mainly right now that what I’m, what I like to see is to find different ways of getting that, like get the seeds and do, do some planting, like what we do with those other species, lodgepole and spruce like that. And I’m sure that these trees are, in this picture, you see, you could see a lake right there. A guy could probably plant, plant some right around there, and they will come up, they’ll be big like that. Then if you planted them higher, they’re going to be stunted like those little ones.” (Floyd, Q10)
Chapter 4: Discussion

Comparative Findings among Interview Respondents

While these six individuals from different bands of the Blackfoot Confederacy had varied backgrounds, all of them had some significant connection to traditional cultural relationships with the land. Most had some experience as a child that exposed them to some cultural practices. In the case of several individuals, this was initiated through collecting plant materials with older relatives. For example, Jolene remembers how at a young age, she and her grandmother collected wild strawberries at Chief Mountain. Pauline remembered how she and her grandmother prepared prior to harvesting medical plants. Similarly, in Floyd’s younger days, he was taught a specific harvesting fashion for gathering scared incense for his grandparents.

Those participants with some prior knowledge of the WBP (i.e., Pauline, Clarence and Floyd), shared a wide range of different cultural uses of this tree species. Pauline’s perspective focuses on the WBP’s medical and nutritional values. She mentioned that the “early spring needles … are really sweet so it makes great cough syrup, rich with vitamin C.”. Clarence recalled learning from his great aunt that tree sap (“that gummy stuff”) could serve as a temporary glue or water repellent, and also explained how they would build a sweat lodge with whitebark pine stems when in the mountains.

“We don’t normally camp in, in the mountains with teepees and all that. But one of the things people don’t know, we also build a sweat lodge kind of a shelter. You know how a sweat lodge is kind of that shape….if you put them like this, they kind of give a little bit of a barrier. And then they put their … their buffalo hide … underneath.”

Floyd’s perspective focused on WBP’s merchantability at lower elevations where he thought the larger, straighter stems could be economically harvestable, but he also had
long experience collecting timberline WBP for incense and smudges. Historically, indigenous communities had many culturally specific uses for this WBP species, including harvesting of the pine nuts and inner bark. While a wealth of knowledge about WBP was collected from the participants familiar with this tree species. Interestingly, even those not previously aware of the ecological story of WBP contributed thoughtful perspectives regarding these forest ecosystems.

The cultural experiences of traditional collecting practices for certain plants seemed to cultivate a perspective of sustainability in many of these individuals. Jolene and Betty share a sustainable perspective that managers should make informed management decisions based on providing for the seventh generation to come. Jolene thought learning about natural resource processes was best done by fully experiencing the natural environment and being one with the land. Some of the tenets that she had learned and passed along included only harvest what you need; (indigenous intelligence) replenish the environment after harvesting; (indigenous intelligence) understand all life forms serve a purpose in order for the circle of life to survive. Jolene said, “We used to have a lot of trees here back when we were growing up. And we were always taught to take care of the land, because it belongs to Mother Earth and it’s precious. So everything you take ..., we were always taught to put back, and to say a prayer and, for the reasons why we were taking that”. About this concept of being mindful and giving back to the land, Betty explained “there was a thoughtfulness behind anything we took from nature; a prayer before, a song of that plant, that animal. We’d sing their song and beg for their help and pray to them and acknowledge their beauty and their essence and I need you for my family, I need you for my survival.”
Several individuals perceived of the forest as a “way of life”, in that the people were dependent upon the land’s many resources, but recognizing that people bear some responsibility to protect the forest and its natural processes. Jolene explained how the forest provides many things, including timber for lodging, medicine for sickness, and wild game for food. “We should always take care of our forest”, she said. “Without our forest we can’t have the animals. We’re taking their place to live. We won’t have food, the water, the forest gives us air, cleans the air.” Similarly, Clyde suggested that, “anything that works to try to preserve it, I think should be undertaken”. He discussed the importance of the forested watersheds “that actually purifies the snow to give us clean water for those of us that live at the foothills of the mountains, and all things live off this water, the animals and trees all of us depend on. It affects everybody that lives in and near the mountains of Montana, because the water from that watershed goes all the way down, all over through Montana and through Canada also.”

While the concept of caring for the forest as part of the sacred relationship between the people of the Blackfoot Confederacy and their land was expressed by several individuals, this was balanced in some by a recognition of human limitations, as well as a wariness regarding the ability of modern western scientific management to “fix” nature generally, or to “restore” whitebark pine forest communities, specifically. Clyde shared his perspective that all living things have to die at some point, and humans have limitations when assisting or intervening with natural processes. “I don’t know”, said Clyde. “I got mixed feelings on science and technology, man’s interference and man’s intervention”. Betty was more direct in her doubts about human interventions with
nature. Betty believes the forest will live forever and is capable of surviving without humanity. She argued that

“Humans aren’t smarter than nature. That’s my bottom line. All the good intentions in the world can’t correct the harm we’ve done, can’t eliminate the harm we’ve done. And a last-ditch effort at correction when they’re on the verge of extinction (i.e., whitebark pine), I have a hard time with it. I have a hard time with it, because maybe nature’s got some other plan. Maybe, I think the mountains are forever. I hope the mountains are forever, and nature will take care of the harm we’ve done.”

While there were some consistent threads expressed among respondents, the individual perspectives of each was certainly shaped by their own unique experiences with traditional ways, cultural practices, and other factors. Their individual worldview (or differences in their perspectives on the role of humans) appeared to shape their comfort with alternative restoration strategies that might be employed in WBP forests. For example, Betty, Jolene and Clarence share a perspective of living at one with nature’s natural processes of change. They all agree humanity plays a small part in a bigger picture, where all things are interrelated in complex relationships. Betty makes it clear in her statement that “nature knows best” and humanity has a responsibility to adapt to and learn from natural processes. Jolene felt that people should appreciate nature by being good stewards of the land. All expressed the belief that humans could be better conservationists by incorporating an Indigenous management ethic that is structured around maintaining balance.

There was substantial variation in the extent to which these individuals were familiar with the specifics of WBP forests, and threats to WBP from blister rust and mountain pine beetle. Nevertheless, after being introduced to the issue, most everyone
was able to share their perspectives on the suitability of different active restoration strategies. For instance, Jolene highly respects the process of genetically modifying a blister rust-resistant Whitebark pine. Her favorable perspective focuses increasing forest health by utilizing today’s technology to help restore WBP. Betty thought, “…we have an obligation to protect it for sure like we have an obligation to protect all living things. I can’t say I really have an opinion about how far. It’s more a responsibility than an obligation. All things exist for a reason, even the fungus…” Pauline perceived this type of genetic engineering was like using modern medicine. Floyd thought was a great research project and is interesting in exploring this opportunity. He said, “See, I think that’ll be okay, because they’re experimenting, see. There, and if that works, well, you know, kind of help along, we could help along by planting those seeds too.”

However, other respondents were concerned about such human intervention. Clyde thought genetically engineering WBP might help increase the decline of WBP and entire forest structure and function. He said,

“I don’t know. I got mixed feelings on science and technology, man’s interference and man’s intervention on a part. … is it still going to be the white bark pine tree? Is it going to be a genetically different type of tree that . . . And I think you’re actually defeating the purpose, trying to save a tree that you may be helping to cause further extinction of that tree and what you now raise is a genetically engineered tree. So the white bark pine in that way is gone. But if it’s still the same tree, I’m all for it.”

Betty was more certain about the lack of wisdom of genetic engineering than Clyde, stating that “humans aren’t smarter than nature.”
Overall, Clyde, Betty and Pauline share a perspective which indicates a natural boundary or limitation when dealing with human intervention. Betty perceives nature is in control and all livings must die in this circle of life. For example, in the circle of life a fungus is naturally engineered to complete a natural process. Similarly Pauline and Betty thought humanity shouldn’t monitor WBP regeneration by technologically tracking the CNC. Pauline perceives the MPB as a purposeful environmental entity within the circle of life. In the same way Betty thought whether humanity agrees or not WBPR is a fungus which serves a purpose in maintaining the balance of forest ecosystems.

All the interview participants made great contributions in offering their recommendations for future forest management. Their recommendations and perceptions are suggestions that can maybe provide future managers with advice to consider or incorporate for future forest management decision making. Their knowledge may help guide resources managers in designing well rounded and more informed management strategies engineered specifically to a particular people and landscape.

Jolene recommended that it is very important for managers to consider the future generations. She states,“Well basically for our younger generation, they’re not going to have the opportunity to be fulfilled with the white bark pine tree and what its meanings could be to, for sickness, for health and the continuous growth too, the other animals in the forest and plants.” Betty advises future resources managers to, “Pay attention. Pray hard and listen. Pay attention to the answer. Nature will show you. Nature will show you. The old people that walked this land 5,000 years ago will show you. Better than science. And science might be part of the answer. But the old people will tell you,
because they knew how to listen. And if you’re sincere and you’re asking, you’ll know how to listen. . .”

Clarence suggested that:

“...cultural protection officers in the states that if they find something that’s in an adjacent state of Montana but the linear affiliation goes to let’s say the Blackfeet, then it involves land too. It involves the environment. So they got to make sure they hold their word on what they say they’re going to do. So because all part of it is forest trees, all those people that are taking care of the environment, the forests and everything, they’re enforcing something, a law that’s made by the United States.”

He also advises future managers of tribal landscapes to learn that “... part of the management is you’ve got to understand the traditional ways.”

Clyde advises future resource managers to,

“Work together in harmony. I think they’ve got a really important job to try to preserve a species that may look like it doesn’t need, it doesn’t look, it looks insignificant. But to me now I think it is of the utmost importance to try to preserve this tree, because one hand feeds another within our environment as these animals and these trees are working together to live. And I think the animals and trees are assisting us to live. So yeah, they should work together in harmony and worried about what other issues they have. And work eyeball to eyeball and, yeah, just go for it.”

Floyd would like managers to be culturally sensitive of sacred offering sites in the forest.
Lessons Learned

On a personal note, I have learned that anyone interested in obtaining this type of information realistically must go out there and gain for themselves first-hand knowledge and experience in gathering concrete and viable indigenous research information. I have learned that this is a long journey process and quest for the pursuit of this particular type of knowledge. In this perspective my journey was full of trials and tribulations which I suffered for the sake of acquiring the knowledge I needed to finish this project. I believe this information cannot be gathered or evaluated totally by European educational standards. Therefore, I believe everyone's research journey will be different and there is no set way or method of acquiring this kind of information. However, I feel confident one thing that stays the same is pain and suffering for something that will provide huge positive outcome for the people. Therefore, I learned endurance is the key factor to overcoming fear, failure, shame, jealousy and whatever else comes your way to hinder what you have set out to accomplish.

On a more general level, the following points could be offered as key lessons learned from this project that might inform similar future projects:

1. Work between boundaries/cross cultural - For example I interviewed both US and Canadian respondents across three of the five bands of the Blackfoot Confederacy.

2. Go interdisciplinary - For example I mixed Social Science, with Forestry, Ecology, Conservation, Anthropology and Native American Studies.
3. Methods - Go through IRB (Internal Review Board) as early as possible in the process. These processes of gaining approval for research with human subjects, not only at the University level, but also at each of the tribal governments can be drawn out, particularly if boards only meet periodically.

4. Be Collaborative to gain support and assistance across a range of people supportive of the project.

5. Capture the big picture - For example open your mind to many different perspectives.
References


