2013

THE ARCHAEOLOGICAL INVESTIGATION OF CEDAR BARK BASKET TREES IN WESTERN MONTANA: BACKGROUND, METHODS, AND TRIAL STUDY OF CULTURALLY MODIFIED TREES

Dean Sonneah Nicolai

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THE ARCHAEOLOGICAL INVESTIGATION OF CEDAR BARK BASKET TREES IN WESTERN MONTANA: BACKGROUND, METHODS, AND TRIAL STUDY OF CULTURALLY MODIFIED TREES

By

Dean Sonneah Nicolai

B.A. in Anthropology, University of Montana, Missoula, MT 2007
B.A. in Native American Studies, University of Montana, Missoula, MT 2008
Master of Philosophy in Indigenous Studies, University of Tromso, Norway 2012

Thesis

presented in partial fulfillment of the requirements for the degree of

Master of the Arts
Anthropology

The University of Montana
Missoula, MT

Official Graduation Date: Spring 2013

Approved by:

Sandy Ross, Dean of The Graduate School
Graduate School

Dr. John E. Douglas, Chair
Department of Anthropology

Dr. Anna M. Prentiss, Committee Member
Department of Anthropology

Dr. David Beck, Committee Member
Department of Native American Studies
The Archaeological Investigation of Cedar Bark Basket Trees in Western Montana: Background, Methods, and Trial Study of Culturally Modified Trees

Dr. John Douglas

This thesis explores the potential for archaeological investigations of culturally modified trees (CMTs) in the northern Rocky Mountain region of Western Montana. Culturally modified trees are considered to be living artifacts, representations of traditional culture, and a lasting physical manifestation of long term use by inhabitants. The goal of this thesis is to offer an archaeological perspective for investigation of cultural modifications of the cedar basket tree (*Thuja plicata*), and to contribute to the development of a method for inquiry and analysis. Two primary research questions were posed: *How does the study of behavioral archaeology and the methodological approach presented in this thesis contribute to the understanding of indigenous culture? How does the investigation of cedar basket trees contribute to understandings of the cultural landscape?* Culturally modified trees are characterized by their physical characteristics, determined by both the original morphological alteration and the subsequent physiological response to the modification. Measurable attributes help identify the uses of CMTs and are representations of the behavior of indigenous peoples and their cultures. Further, spatial and temporal studies can reveal complex dynamics among traditional ecological knowledge systems, historical and cultural landscapes, and resource stewardship. To illustrate the research potential of culturally modified cedar basket trees, a small-scale study of a grove in Western Montana was undertaken to collect data on historic CMTs that were analyzed for clues to past behavior on the landscape. Dendrochronology indicated that cedar harvesting at the study site occurred from 1962 to 1998. Specific attributes were compared which revealed that general relationships exist between basket length, width, and tree diameter. Through the archaeological study of culturally modified trees we can begin to understand the cultural connections these trees have with people and the landscape. Their identification and study are important, because loss and destruction of culturally modified trees are of concern to aboriginal communities, cultural resource managers, and to the understanding of cultural landscapes.
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1. Introduction

This thesis explores the potential for archaeological investigations of culturally modified trees (CMTs) in the northern Rocky Mountain region. CMTs have recently become of interest to archaeologists because of their potential contribution in an array of professional research and their potential for anthropological inferences. This growing body of research suggests there is anthropological value in the study of CMTs. Archaeological investigation has focused on the prehistoric and historic uses of CMTs and is considered an indicator of general human behavior as well as a record of specific indigenous people’s use of forests. CMTs have been recognized as the remnants of living and past histories and of global ethnoecological importance (Turner et al. 2009:238). The scattered remnants of CMTs are part of the large populations of living trees. These are living archaeological artifacts and archives composed of the phenomenon known as CMTs. The goal of this thesis is to offer an archaeological perspective for investigation of the cedar basket tree (*Thuja plicata*), and contribute to the development of a method for inquiry and analysis. My central research questions are: *How does the study of behavioral archaeology and the methodological approach presented in this thesis contribute to the understanding of indigenous culture? How does the investigation of cedar basket trees contribute to understandings of the cultural landscape?* The goal of the thesis research concentrates first on the presentation of the prehistoric and historical context of CMTs and their connections to indigenous peoples focusing on ethnographic histories and cultural and ecological significance. The anthropological and archaeological contexts are also discussed, with special consideration given to research methods. Presented fieldwork illustrates the value of cedar bark baskets based on their unique ethnographic and archaeological characteristics within CMT studies. Analytical implications are discussed within the context of the proposed methodological perspective and a landscape theoretical perspective. This thesis argues that CMTs, specifically cedar basket trees, are morphologically identifiable and the existing methodology for their study is capable of contributing to refined understanding of the archaeological record.

1.1 What is a CMT

Culturally modified trees can be defined as the intentional modification of trees in the past by aboriginal peoples as part of their traditional practice of utilization of the forest (Arcas
CMTs include many species of trees, utilized for many purposes and recognized by archaeologists throughout the world. In North America, particularly within the Northwest regions of the United States and Canada, many common trees were utilized for economic and subsistence activities (White, 1954:2). These trees include the Ponderosa Pine (*Pinus ponderosa*), Lodgepole Pine (*Pinus contorta*), White Pine (*Pinus monticola*), Quaking Aspen (*Populus tremuloides*), and of course the Western Red Cedar (*Thuja plicata*) which has been called the “cornerstone of Northwest Coast Indigenous culture” (White, 1954:2; Turner et al., 2009:250). Subsistence activities often consisted of cambium stripping, a practice utilized to provide an additional food source or dietary supplement (White, 1954:2). CMTs have been called *culture trees* and *sacred trees* because of their spiritual significance in rituals and ceremonies (Garrick, 2002:25; Turner et al., 2009:239). Other uses of CMTs include boundary markers, trail markers, and *witness trees* which “express ownership” and stand as a record of historic or mythic events (Turner et al.: 2009:240). The remnants of these traditional activities are commonly referred to as *scarred trees* today (White, 1954; Turner et al, 2009:238). The scars CMTs display are characterized by their physical characteristics, determined by both the original morphological alteration and the subsequent physiological response to the modification. Measurable attributes help identify the uses of CMTs and are representations of the behavior of indigenous peoples and their cultures. These features are discussed in further detail in the following chapters.

**1.2 Research Significance**

The significance of CMTs are viewed as a symbol of traditional culture and a lasting physical manifestation of long term use by inhabitants (Turner et al., 2009:238). The utilization of forest resources by indigenous peoples during the historic period underwent major interruptions and changes. The loss and destruction of cultural resources from logging during the historical period was noticed and became a preservation concern amongst archeologists, cultural resource and heritage managers and amongst aboriginal communities (Marshall, 2002:3). These losses have been contentious amongst aboriginal and non-aboriginal communities because of their implications on land tenure and occupancy, and the broader implications of preservation and conservation (Turner et al., 2009:238). CMT studies shed light on traditional aboriginal management practices associated with indigenous worldviews embedded within traditional
beliefs about conservation and preservation (Turner et al., 2009:238). Turner et al. (2009:238) tells us that CMTs “…contribute to the formation of cultural landscapes…” as reminders of the connection to the land, and that “…present the possibility of understanding such cultural connections to landscapes.” The “…embodiment of cultural, historical, and economic manifestations of human environment interaction…” is at the forefront of much of the current research on CMTs and constitute “…significant and sometimes legally recognized evidence of the occupancy and use of trees and forest ecosystems…” by indigenous peoples (Turner et al., 2009:239). The archaeological implications of spatial and temporal studies as complex dynamics among traditional ecological knowledge systems, historical and cultural landscapes, and resource stewardship can “…extend our understanding of ethnoecological relationships between humans and trees…” (Turner et al.: 2009:239)

1.3 Research Objectives & Research Questions

Because this thesis focuses on living trees, the aim is to offer a methodological approach that accounts for gaps in prehistoric and historic use. Living CMTs are known to cross over between the prehistoric and historic eras in the Northwest regions of the United States and serve as an optimal tool for investigation of cultural continuity within the study area of Western Montana. In White’s 1954 (White, 1954:14) study of scarred trees in Western Montana, dated trees within the pre-contact and contact eras were determined to fall within an estimated range of 1739 to 1914. One objective of this thesis is to present a methodological perspective for building on White’s important archaeological investigation, providing further context for the traditional aboriginal practice of tree modification and traditional cultural activities. Historic and ethnographic records are utilized, as well as archaeological research focusing on prehistory and historic contexts of known indigenous peoples within the study area.

Analysis is based on ethnographic, historical, and archaeological contexts within the region of Western Montana, as well as the archaeological context of a pilot study of a cedar basket harvesting site surveyed for this thesis. These culture trees are considered an enduring symbol of a lasting and deep spiritual and ecological sensitivity; the connection to indigenous peoples is the living proof of that bond (Garrick, 2002:25). Analytical objectives are met by exploring this phenomenon by both qualitative and quantitative means, focusing first on temporal and spatial aspects of demographics (occupation and settlement patterns) and subsistence strategies (group
organization and harvesting strategy). Behavioral investigation is examined using morphological variability of the modified cedar basket trees. Morphology of a CMT is defined as the “consequence of a specific technology applied to a particular tree species for a particular function” (Mobley & Eldridge, 1992:96).

Again, my research questions are: How does the study of behavioral archaeology and the methodological approach presented in this thesis contribute to the understanding of indigenous culture? How does the investigation of cedar basket trees contribute to understandings of the cultural landscape? In a nutshell, this thesis suggests that understanding the cultural and historical significance of temporal and spatial landscapes can be fleshed out with the study of CMTs and a behavioral approach to archaeological investigation.

1.4 Case Study Identification

There are a variety of CMT types utilized within the Northwest United States, but none are more prevalent than the western red cedar which served a vital role to indigenous populations of the region (Styrd and Feddema, 1998:4). The value of the cedar was apparent to those who used it; all of its parts were a cherished resource. Northwest coast peoples utilized it for canoes, paddles, clothing, planks for houses, household and utility items, and baskets (Styrd and Feddema, 1998:5). Although the use of the cedar tree seems to diminish as one moves further east across the plateau into Montana, it was still a valued resource and had specialized uses as berry baskets and storage baskets (White, 1954:7). There are remnants of these basket harvesting sites strewn across the landscape of Western Montana. This thesis concentrates on one site located in the Mission Mountain range on the Flathead Reservation. This site has not been registered within the records of the Montana State Historic Preservation (MSHPO) database but is known to the Confederated Salish and Kootenai Tribes (CS&KT). As this site is of a highly sensitive nature, it falls under protection of the CS&KT Preservation Department and preservation bylaws of the CS&KT. The significance of the site to the tribes is not well known within an archaeological context. However, it has a cultural and sacred connection to the past and present for local indigenous people. This site today is in traditional use although a large portion has been damaged, evident by the current remains of the Flathead Irrigation Project and Mission Dam projects.
1.5 Thesis Methodology

1.5.1 Data Sources and Collection Methods

Primary research included field research of the cedar basket harvesting site located in the Mission Mountain Range, Montana. A comprehensive research approach uncovered ethnographic, historical, and other relevant literature within the context of the locality of Western Montana and the indigenous peoples who have occupied the region. The University of Montana’s Mansfield Library was employed as a secondary resource for literature research. Secondary resources included relevant journal articles relating to archaeological investigation of CMTs, cultural and historical significance, and theoretical significance. Due to the sensitive nature of this cedar basket harvesting site, only the previously published research is presented while sensitive tribal knowledge is avoided. Permission from the CS&KT Salish and Pend d’Orielle Elders Committee was granted for a field pilot study and the use of data related to the site survey, collection and background research. Background research of previous archaeological investigation within the context of CMTs of Western Montana, North America, Northern Europe, and Scandinavia is also presented.

1.5.2 Archaeological Data Collection and Survey Methods

Archaeological data and survey methods are outlined in the following section, and discussed in depth in following chapters. Field work on the cedar basket harvesting site was conducted by the author during the summers of 2010 and 2011. The data collection method used was developed and prepared by the British Columbia Archaeological Branch (Stryd, 2001) and modified to fit this study to determine what attributes were observed and recorded. Empirical observation and the development of the methodology by Carlson (1998, 1998b), led to an approach that analyzes the frequency and occurrence of measurable scar features, and general morphological attributes (Marshall, 2002:7). This recording approach was originally developed to measure the morphology and attribute variability of cambium peeled trees; nevertheless, it also suits the data recording and analytical components for interpretation of cedar basket tree scar variability. The temporal component of the analysis is based on several research methods which focus on cultural scarring dates and harvesting timelines. The recording of scar data included: empirical
observation, scar attributes, photographic documentation, location, and increment bore samples for dating and temporal analysis. These methods are discussed in detail in later chapters. Due to the sensitivity of the location and the recommendation of the CS&KT Salish and Pend d’Orielle Culture Committee, GPS coordinates were not taken and maps are not provided, but relative geographical locations relating to Salish and Pend d’Orielle cultural landscapes are noted as a contextual component of temporal and spatial importance.

Preservation of CMTs is a concern present in much of the literature. The proposed methodological perspective for recording and dating CMTs considers the ecological and spiritual sensitivity of CMTs by indigenous peoples. Indigenous people seem to have taken great care in scarring them in a fashion where as not to destroy or kill them, accounting for the longevity of CMTs (Ostlund et al., 2005:323). It is important that any method to study CMTs takes into account indigenous values, including the requirement not to endanger the future of these trees.

1.5.3 Theoretical Framework

Silverman (2010:109) says that theory is “a set of concepts used to define and/or explain some phenomenon.” Landscape archaeologists focus on relationships of archaeological phenomena to features of the natural environment and at scales larger than single sites (Hollenback, 2010:186). The behavioral approach within landscape studies offers an explicit framework for “…investigating formation processes at the landscape level…” and “…understanding how people interact with places, spaces, and landscapes over time in their explorations, alterations, use, and maintenance of these elements” (Hollenback, 2010:186). Landscape theory holds that landscapes have meaning to humans, and that landscapes are culturally constructed. Landscapes can function as either narratives or a symbolic legacy that can be manipulated or appropriated. There are two identifiable meanings in anthropology of landscape: the first is “…as a framing device used objectively to bring a people into view”, and the second is “…to refer to the meaning people impute to their surroundings”; now “…the concept of landscape is productive in accounting for the social construction of place by imbuing the physical environment with social meaning” (Low and Lawrence-Zuniga, 2003:16). In this way, people socially construct meaningful relationships with their landscape.
The theoretical component helps to define the spatial dimension of archaeological CMT sites which considers their distribution across the landscape. CMT sites are distributed across the landscape in a manner that is rarely clearly bounded, and often pose a problem when defining site boundaries (Muir and Moon, 2000:2). Ostlund (et al., 2002:49) suggest that the places that are populated by CMTs should be regarded as cultural landscapes and interpreted as such. The need for understanding traditional cultural practices of CMTs requires a landscape approach for survey and sampling strategy (Andersson et al., 2008:463). The sample based strategy for objective analysis makes spatial variation of CMTs more visible, and the combination of both spatial and temporal analysis of whole landscapes allows for a better understanding of traditional practices in situ and their relation to forest resources (Andersson et al., 2008:468).

Much of what has been presented above in this subsection is valuable for temporal and spatial comparisons and analysis of CMT sites, however as mentioned already spatial comparisons here are inhibited by the lack of recorded cedar basket sites and the absence of GPS and site mapping for the pilot field study in this thesis. This thesis and pilot study however creates the possibilities for further research, site comparisons, and the application of landscape perspectives for analysis.

1.5.4 Data Analysis and Interpretation

Two models (A and B) are presented which investigate the behavior associated with cedar basket harvesting. Both models are indicators of behavior, but differentiate in the sense that Model A concentrates on the temporal and spatial aspects of demographics and subsistence, while Model B focuses on morphological variability of harvesting attributes.

Because GPS coordinates were not taken and mapping was avoided due to cultural sensitivity and knowledge of the field site location, in depth temporal and spatial comparisons are only discussed through historical and ethnographic contexts. Temporal and spatial analysis based on the pilot field study is presented in the analysis to illustrate the possibilities for investigation of cedar basket trees. Another constraint on temporal and spatial analysis is the lack of previous archaeological studies of cedar basket harvesting sites; this limits the possibilities of regional temporal and spatial comparisons which would likely require an extensive sample of cedar basket harvesting sites and temporal data to make definitive conclusions.
Model A makes use of historical, ethnographic, and archaeological contexts for comparison with temporal cedar basket scar data to make inferences about cultural behavior. It has been acknowledged that CMTs provide a unique temporal and spatial archive for gathering information on the movements of native peoples and the utilization of the land (Ostlund et al., 2005:315). The use of historical and ethnographic records is needed and helps to corroborate temporal and spatial patterns (Ostlund et al., 2005:216). Based on these acknowledgements, scar morphology and variability with respect to Model A first is analyzed by identifying temporal patterns with respect to scarring events and cedar basket harvesting preferences such as length (LEN), width (WID), and age of the basket scar (AOS). Model A considers the temporal and spatial aspects of cedar basket harvesting locations in correlation to archaeological site distributions and natural geographic features of the landscape. Archaeologists have noted that CMTs help to connect archaeological materials with specific settlement patterns and uses of resources in the past such as prime berry patches that are often associated with CMTs (Turner et al., 2009:263). Archaeological sites such as trails, camp sites, lithic quarries, and traditional berry harvesting sites, along with natural geographic features such as water sources, are useful for spatial correlations and comparisons within and between other cedar basket harvesting sites. Certain harvesting preferences are hypothesized to be indicators of a behavioral pattern. Harvesting preferences are characterized by distinct morphological patterns that account for basket size and age of the scar. The frequency or the number of occurrences of baskets harvested over time is a representation of harvesting preference. Specifically I am interested in the number of baskets being harvested relative to the size of the baskets. For example, a small harvest of large baskets with temporal gaps might indicate a local subsistence behavioral pattern (group organization and harvesting strategy) that is characterized by small family group subsistence activity and minimal sustainability of local berry harvesting. This example may also represent a variety of scenarios such as demographic (occupation and settlement) abandonment of cedar basket harvesting practices in favor of technological change such as the use of purchased containers, or the pressures of assimilation to abandon traditional cultural practices, or competition or abandonment of traditional territories.

Model B also deals with morphological variability in relation to harvesting preferences. Morphological variability here is determined by statistical analysis based on the observance of distinct harvesting attributes of length (LEN), width (WID), diameter (DBH), orientation (SDE),
and age of scar (AOS). Model B differs from Model A with a focus on functional inferences based on the modifications that took place in the scarring of trees (Mobley & Eldridge, 1992:94). These functional inferences look at how and why trees are exploited, who might be responsible, and are correlated with ethnographic and historical records (Mobley and Eldridge, 1992:94). For example, statistical analysis has often focused on the orientation of CMTs; in one case the preference of the northern side of trees for modification suggested that spiritual practices may have had an influence (Ostlund et al., 2005:321).

Both models presented here make use of landscape perspectives for analysis and interpretation. These perspectives are expanded upon in Chapter 2 and which consider the formation processes of landscapes. Chapter 4 analysis again makes use of landscape perspectives to help contribute to an understanding of indigenous culture and the cultural landscape.

1.6 Chapter Summary

This introduction outlines the main goal of the thesis which is to introduce a methodological perspective for the investigation of CMTs. Research questions address how a methodological perspective for the investigation of cedar basket trees and a behavioral archaeological approach can contribute to the understanding and formation of cultural landscapes. Fieldwork completed on a cedar basket harvesting site helps to illustrate a methodological approach for investigation of cultural behavior. The goal is not to provide definitive conclusions about indigenous use patterns, but to offer the possibility of better archaeological inference from data and a new methodological perspective for investigating CMTs. CMTs are significant because of their ability to be dated, their ability to establish specific activities related to land occupation, and their importance in addressing research questions concerning changing demographics and settlement patterns (Stryd & Feddema, 1998:18). CMTs are a representation of the presence of ancestry, and the interrelatedness of archaeological sites to each other and the landscape (Stryd & Feddema, 1998:20). Trees that are culturally modified are indicators of human activity (Eldridge, 1982:21).

This thesis looks at specific research that can provide information about these complex relationships. To accomplish this, a comprehensive research review focused on the use of trees, CMT typologies, and historical and ethnographic contexts is needed. Further, these aims require
a review of previous research in archaeological investigation of CMTs focused on methods for surveying and recording. These reviews are presented in following chapters along with the presentation of fieldwork and the proposal of a methodological perspective for archaeological investigation of CMTs.
2. Introduction: Landscape Meanings

The focus of this chapter is on the anthropology of space and place, landscape archaeology and theory. *How do people form meaningful relationships with the landscape, how do they attach meaning to space, and how do they transform that space into place?* I will discuss the central tenets of landscape theory, identifying themes of various approaches. The review provides a theoretical direction for the thesis, as well as providing context for the behavioral landscape approach for the analysis of the CMT case study.

2.1 Theoretical Conceptions of Landscape and Landscape Archaeology

Because landscape archaeology and theory is an integral portion of this thesis, the need to provide its meaning and background is given in this chapter. Given the complexity of landscape meanings this chapter offers a variety of relevant perspectives in landscape theory and landscape archaeological approaches.

2.1.1 The Theoretical Landscape: Space and Place

The foundations of contemporary landscape approaches are rooted in the social sciences extending back to the nineteenth century and the early twentieth centuries where scholars such as Ratzel looked at the relationship of human groups and their differences in relation to their natural environments, and where Durkheim viewed society as an outgrowth of “collective consciousness” shaped by “institutional frameworks” and considered human environmental interaction of indirect concern (Anschuetz et al., 2001:157-58). Through Sauer’s later work in geography, which was influential on the emerging field of anthropology in the United States, an approach was created whereby the cultural landscape is seen as a result of cultural agency and the natural environment as the *medium* and influence (Sauer, 1925:46). Sauer who was an empiricist believed that visible elements of the physical environment influenced the management and modification of them, noting three elements of the environment: “the physical environment, the character of the people, and time” (Sauer, 1925:38). In the early twentieth century British geographers and archaeologists introduced and made use of distribution maps to accurately identify and locate archaeological sites and began to explain site distributions within the context of geographic features (Anschuetz et al., 2001:168). There have been many theoretical influences
on landscape theory and the theory of space and place. Beginning with cultural ecology “…which looked at the variety of human cultures and their adaptation to the environment”, and required the ethnographic information and environmental knowledge of Native Americans for explanation (Gamble, 2008:25). Early distribution studies and ecological anthropological work of Steward and Clark influenced settlement pattern approaches of the 40s and 50s where these patterns were a reflection of the natural environment and shaped by cultural necessity (Anschuetz et al., 2001:168). Willey’s approach to settlement patterns focused on features of past cultures as physical phenomena linked spatially to other physical phenomena on the landscape based on “…internal transformations rather than external factors such as diffusion and migration” (Anschuetz et al., 2001:169). Willey noted that “…settlements reflect the natural environment…” and “… offer a strategic point for the functional interpretation of archaeological cultures” (Willey, 1953:1). Yet, even while Willey was applying these ideas to archaeology, the meaning of landscapes was changing in regional studies. Landscape was seen through the work of English historian W.G. Hoskins in the 1950s and 1960s, “…as the social construction of space, containing a bundle of practices, meanings, attitudes, and values”, a more humanistic approach to understanding the environment (Darville, 2002:220).

The 1960s and 1970s marked a split by geographers within landscape disciplines, the first was an explicit positivist scientific approach with emphasis on a spatial quantitative approach of documentation and evaluation of human occupancy in physical space, and the second was a humanistic approach based on “…philosophies and methodologies in the exploration of human values, beliefs, and perceptions…” which in turn influenced perspectives in phenomenology (Anschuetz et al., 2001:165). The new archaeology and settlement pattern studies of the 60s and 70s pioneered by Binford looked at sites within the landscape rather than site themselves, focusing on activity patterning of within places and between places (1982:5). At least some New Archaeologists recognized that anthropogenic landscape modifications consist of social and ideological dimensions rather than just physical modifications of the environment (Deetz, 1990:2).

Processual and post-processual archaeology have been influenced by studies on landscape meanings. Hollenback (2010:186) states that despite the multitude of landscape meanings, landscape archaeologists share an interest in archaeological phenomenon, where behavioral
aspects are focused on landscape interactions and landscapes are seen as artifacts with features in the natural environment at a scale larger than the site itself. Archaeology first began to use landscape approaches in the 1970s and 1980s, which prompted a post-processual interest amongst behavioral archaeologists who approached landscape studies as an explicit framework for “investigating formation processes at the landscape level”, and for “understanding how people interact with places, spaces, and landscapes over time in their explorations, alterations, use, and maintenance of these elements” (Hollenback, 2010:186). This approach follows Binford’s lead, which focused on explanations of culture processes rather than cultural descriptions of the landscape, and a desire to continue studies in a more scientific approach (Johnson, 2004:12). Processual archaeology, as defined in Johnson (2004:24), “offers a scientific learning strategy that systematically builds on prior knowledge to inform our ignorance about variability in the archaeological record, and by extension the natural and cultural processes that contribute to its formation.” The prior knowledge Johnson (2004:24) refers to is Binford’s knowledge of environmental variability, and ecological dynamics that ultimately lead to the development of frames of reference to use for archaeological analysis. Studies in the field of processual archaeology have been centered on technology, subsistence, mobility, and environment in relatively small-scale hunter-gatherer groups. However, as Johnson (2004:24) states, these areas of study are not the limits of processual archaeology.

In the 1980s landscape archaeology began to take shape; however, at the time regional archaeology overshadowed and competed with a landscape approach by focusing more on site distributions, artifact distributions, subsistence-settlement systems, and human environmental interactions (Schiffer, 2010:187). Anschuetz (et al., 2001:165) explains that during the 1980s and 1990s fields such as historical ecology, cultural anthropology, and archaeology, drawing from the tradition of geography, has taken steps to incorporate landscapes within their studies. Historical ecology incorporates the concerns of humanistic geography by looking at formal landscapes in terms of a community’s values and beliefs where “…people project culture onto nature” (Anschuetz et al., 2001:166). Cultural anthropologists have taken an approach that incorporates the views of indigenous peoples that view landscapes as a product of memory and tradition, and challenge the idea that “…places are defined by static boundaries and relationships based on stable residence”, and indigenous communities are “…able to sustain coherent cognitive maps based on perceptions, direct experiences and distant memories, constructed
meanings, and imagination” (Anschuetz et al., 2001:167). These native perceptions and experiences now give meaning to traditional aboriginal locations and recognize the complexity of these locations as spaces of lived in experiences “… thereby illustrating the interdependence of the physical and the ideational within human environments…” and “…their interrelationships, and peoples’ identities are mapped variously on the landscape” (Anschuetz et al., 2001:168).

Ashmore and Knapp (1999) examine the ways in which archaeology incorporates attention to space within the landscape. They say that traditionally settlement archaeology was the mode in which landscape meanings were directed towards the analysis of isolated “hot spots” that are site specific and where recently attention has turned to “sacred landscapes” considering the social meaning of “space as place” (Ashmore and Knapp, 1999:1-2). Ashmore and Knapp (1999:2) stress the holistic approach to landscape meanings provides importance in the “interrelationships among people and such traces, places and features, in space and through time.”

Landscape studies tend to be multidisciplinary, pointing to an extensive history arising independently from British and American intellectual movements including architecture, sociology, anthropology, ecology, art and history (Hollenback, 2010:186-187). In both regions landscape studies have sought to break the “site focused” view of the world (Hollenback, 2010:186-187). Landscape theory in the 1990s has been influenced by and draws on theory from disciplines outside of anthropology including geography, history, philosophy, and sociology. This has allowed anthropologists the ability to understand culture in specialized ways acknowledging that space is essential to socio-cultural theory (Low and Lawrence-Zuniga, 2003:1-2). As Darville (2002) points out, a number of theoretical approaches have used landscape approaches in archaeological practice. There are two main areas of study, the first being descriptive, mapping archaeological features to give a wide area shot of the landscape patterns and arrangements. The second is an interpretive approach that focuses on the social use of space together with comprehension and engagement with the world. Using the application of phenomenology as a framework the focus and interest has become more on much larger areas, comprised of individual sites, rather than interest in examining single defined sites (Darville, 2002:220-221).

In the 1990s landscape archaeology began to be influenced by other theoretical approaches prominent in post-processual archaeology such as structuralism, post-structuralism, and
phenomenology, leading to less emphasis on economic and functional views and more of a focus on “attempts to understand the ways in which natural and architectural features were experienced by humans in the past and how modification of the landscape can be interpreted as a reflection of cognitive processes” (Shaw and Jameson, 1999:351). Hollenback (2010:187) states that the impact of post-processualism on landscape studies has diversified, presenting research combining landscape with ideology, identity, ethnicity, and symbolism. Ingold (1993) adheres to the unity of multiple disciplines and unity of themes of archaeology and social-cultural anthropology. Two themes are presented by him: human life as a process that involves the passage of time and life-process, fundamental to “…the process of formation of the landscape in which people have lived” (1993:152). He sees the purpose of his 1993 article as a way to unite the perspectives of archaeology and anthropology through a focus on the culturalistic view of every landscape rather than a naturalistic view of the landscape arguing that “…every landscape is a particular cognitive or symbolic ordering of space” (1993:152).

Tilley (2010) explains how the phenomenological perspective attempts to gain knowledge of landscapes. The phenomenological landscape approach has recognized that landscapes are “fundamental for human existence” and “…the physicality of landscapes acts as a ground for all thought and social interaction” (Tilley, 2010:26). Tilley (2010:26) says that “…the physicality of landscapes grounds and orientates people and places within them; it is a physical and sensory resource for living and the social and symbolic construction of life-worlds.” Tilley states that knowledge of landscapes is gained through a “…perceptual experience of them from the point of view of the subject…”, reciting experiences with a “…rich or thick description…” involving participant observation and immersion from the inside and which may be contrasted with an outside perspective gained from a multitude of qualitative and quantitative research such as texts, mapping and statistics (Tilley, 2010:25). “Inside” approaches can be based on the researcher’s projection of their own subjective experience into the past or on the use of ethno-archaeological or ethnographic analogies.

Building form a similar perspective, Bender (2002) gives a good description of what landscapes are and what they mean to people and how they engage in them. She states, “Landscapes are created out of people’s understanding and engagement with the world around them”, and “…they are always in process of being shaped and reshaped” (Bender, 2002:103). These landscapes are
always temporal and a recording that is a reflection of human agency and action. She goes on to say that there is spatiality to people’s engagement with their surroundings and illustrates the embeddedness of people to their landscape (Bender, 2003:103).

In contemporary landscape theory in the social sciences there are two identifiable meanings of landscape: the first is “…as a framing device used objectively to bring a people into view”, and the second is “to refer to the meaning people impute to their surroundings” (Low and Lawrence-Zuniga, 2003:16). Low and Lawrence-Zuniga go on to state, “The concept of landscape is productive in accounting for the social construction of place by imbuing the physical environment with social meaning” (Low and Lawrence-Zuniga, 2003:16). In this way people can socially construct meaningful relationships with their environment. Low and Lawrence-Zuniga (2003) describe two categories of space and place that they term Embodied space and Inscribed spaces. They tell us (2003:4) embodied space focuses on proxemics, “…the study of people’s use of space as an aspect of culture”, and “the importance of the body as a physical and biological entity, as lived experience, and as a center of agency, a location for speaking and acting on the world” (Low and Lawrence-Zuniga, 2003:1-2). Inscribed space implies that people leave their mark on the landscape with their presence and focuses on landscape as place, and where relationships exist between humans and the environments they occupy (Low and Lawrence-Zuniga, 2003:13).

Beginning with the title of Chapman’s (2006) book, Landscape Archaeology, his research is focused on the landscape rather than the site, the space between sites and their interrelationships, and, most importantly, the total range of information that may be used to examine archaeological landscapes. His book is a useful and a practical outline and synthesis of contemporary approaches. Space and place in landscape archaeology provides a base for the progression of the field. Applying a dualistic approach for understanding our lived in environment, such as “place is security, space is freedom”, which provides “…an opportunity to divide landscapes of different periods between places and the spaces between them, and that “landscapes consist of a series of places that are culturally constructed through the activities, stories or memories associated with them” (Chapman, 2006:130). Chapman outlines three principle philosophical approaches that he believes will provide avenues to interpretation and management of past landscapes. The first is as a mirror to the history of the land, using methods such as stratigraphic excavation to remove
datable layers to get earlier ones, cartographic evidence, and aerial photography, all of which provide clues to identify a palimpsest of past activities that shed light on today’s landscape. The second is focusing on the physical remains of the past viewed through the scientific reconstruction of changing environments through time, typically using botanical studies as a cornerstone. This analysis than can be used to tease out information about environments and their past conditions. The third is more recent focusing on interpretation of qualitative aspects of archaeological landscapes. Chapman says that this can be accomplished through narrative approaches using techniques from social sciences looking at the interrelationships between monuments themselves and monuments and natural features (Chapman, 2006:11-14).

Chapman (2006:20) categorizes this post-processual trend as *Theoretical*, in contrast to scientific. This trend reflects a more humanistic view of the archaeological record and has become its own discipline applied to landscape archaeology. The central tenet of this approach is “the presumption that landscapes are imbued with meaning, and that this meaning transcends economics and filters into all activities” (Chapman, 2006:20). Now landscapes can be viewed as “interactive platforms for human experience”, and through interaction with the landscape it is constantly changing and altering the relationships between it and the people who interact with it (Chapman, 2006:18-20).

In the aftermath of the processual/post-processual debates, a range of eclectic landscape approaches have been presented, which feature various combinations of behavioral and actor-oriented perspectives. Anschuetz et al. (2001:160) define a paradigm as “a set of working assumptions, procedures, and findings that define a pattern of inquiry about the nature of our knowledge of the world or some aspect of the world.” They consider a landscape paradigm to be a construct paradigm that methodologically is a “system of strategies and tools for approaching particular kinds of scientific inquiry as well as interpreting what they do”, and where they say “In this capacity, a landscape paradigm is defined more by what it does than what it is” (Anschuetz et al. 2001:160).

According to Anschuetz et al. (2001), today’s archaeologists, instead of viewing landscape as a backdrop for cultures material traces, are using landscape in the forefront of their studies—but have trouble with any acceptable definition of landscape and how to use it, and lack the means to
deal with a multiplicity of meanings for landscape (Anschuetz et al., 2001:157-58). These authors contend that the landscape idea is compatible with social sciences and archaeology and can begin to be defined and applied to the landscape approach, and agree that a common terminology is needed for a “pattern which connects” human behavior and place and time. They suggest that settlement ecology, ritual landscapes and ethnic landscapes are key aspects for a landscape paradigm connecting archaeologists and traditional communities (Anschuetz et al., 2001:157).

Anschuetz et al. (2001) examine the issues of what are landscapes, how are landscapes relevant to help build an understanding of cultural processes, and how a relationship between nature and culture can be used to transform physical places into meaningful spaces. The landscape paradigm is outlined in Anschuetz et al. 2001:160-61):

1. Landscapes are not synonymous with natural environments, they are synthetic with culture systems structuring and organizing peoples’ interactions with their natural environments. Landscapes recognize the subjective human experience and its relationship with the external world.

2. Landscapes are worlds of cultural product, and through their daily activities, beliefs and values communities transform physical spaces into meaningful places. Landscape is not the world we see but the construction or composition of that world. Landscapes represent a way in which people signify themselves and their world through their relationship with the environment, and communicating their social role with respect to the external environment.

3. Landscapes are the arenas for all culture activities they are the constructs of human populations, a patterning for all relationships within a place and between place contexts. Observable patterns of both material traces and empty spaces come from interactions between culturally organized dimensions and non-culturally organized resources and life-space distributions. With landscapes organizing perception and action, economy, society, and ideation are not only interconnected but they also are interdependent.

4. Landscapes are dynamic constructions, with each community and each generation imposing its own cognitive map on an anthropogenic world of interconnected morphology, arrangement, and coherent meaning. Because landscapes embody fundamental organizing principles for the form and structure of peoples’ activities, they serve both as a material construct that communicates information as a kind of historical text. Moreover, the landscape, as a system for manipulating meaningful symbols in human actions and their material by-products, and helps to define customary patterned relationships among varied information. Processes of behavioral change across space and over time necessarily result in an ever-changing landscape. Thus landscape is a cultural process.
Methods and analytical techniques are also having an impact on landscape studies. Since the 1990s, Geographical Information System (GIS) technology has revolutionized the documentation and analysis of spatially distributed information in landscape studies. GIS technology can serve landscape archaeology by linking digitized maps and other geographical information with tools that generate quantitative results and provide qualitative graphical interfaces that permit predictive modeling, three-dimensional landscape models, view shed analyses and other analytical functions. This allows for operationalization of an array of theoretical themes within landscape archaeology. These themes have been outlined by (Chapman, 2006:129):

1. As a set of relationships between named locales.
2. To be experienced and known through the movement of the human body in space and through time.
3. As a primary medium of socialization.
4. Creating ‘self-identity’ by controlling knowledge and thereby influencing power structures.

Geographical Information Systems tend to work in service of a western scientific paradigm, with its concern for quantification and analysis of relationships between variables, but has also been used to good effect by indigenous groups to document their traditional land-use patterns (Chapman, 2006:130). Chapman claims that GIS is well suited for exploring and using these theoretical approaches in a quantitative way (Chapman, 2006:130). The Confederated and Salish and Kootenai Tribes have been successful in the use of GIS in their place name project, combining their values to interpret and preserve the landscape (Martin, 2001:40).

Behavioral archaeology is a variant of the processual approach which emerged in the 1970s and 1980s and has since developed its own perspective on landscape studies. It incorporates a life history approach regarding the formation processes of the archaeological landscape, based on the classic behavioral archaeology distinctions between archaeological context and systemic context and the formation processes operating on the archaeological landscape (Schiffer, 2010:188). The *archaeological* context is the world that is observable to the archaeologist today such as visible artifacts, features, sites, whereas the *systemic* context is the unobservable cultural system of the past which produced archaeological effects. In other words, archaeologists aim to infer the
systemic context from what is observable in the archaeological context. Within the behavioral archaeological approach, Whittlesey (1998) considers the goal a holistic anthropology of place that considers the social construction of the environment and landscape as integral to the approach, whereas she believes that in cultural anthropology “…landscapes are approached through an analysis of cognition and symbols” (Whittlesey, 1998a:20). Whittlesey (1998a:21) argues there are different conceptions of space in holistic anthropology of place, and that space “…does not and cannot exist apart from the events and activities within which it is implicated”, and to fully investigate cultural landscapes, “…archaeologists must study both the physicality and social meanings of these phenomena.” Whittlesey (2003:13) says “…a cultural landscape is not only created by people, it is one created by culture… It is the result of people living with the physical and biological environments, interacting with them and modifying them in a myriad of ways, and modeling worldview, ideology, and cognition upon the land.” From this, Whittlesey (2003:14) concludes that cultural landscapes “…do not exist outside the mental templates societies use to understand them”, instead cultures are contextualized and realized within a physical world, and landscapes are shaped by human thought and action. Whittlesey (1998a:24-26) considers the individual life history of different landscapes in the formal, historical, and relational dimensions. The formal dimension involves the modifications made by human activities such as living spaces and ceremonial structures, or natural elements on the landscape used by people; the historical dimension “…which allows for the transformation of landscapes to be identified” including both human and environmental processes and best explored using the life history model; and finally the relational dimension composed of links between humans and the land, the organization of landscapes relative to different elements such as features, sites and regions.

Zedeno (2000:98), another scholar influenced by behavioral archaeology, has developed a landscape framework that draws upon both western scientific and indigenous understandings a behavioral archaeological approach. For Zedeno, understanding lived in environments involves exploring the sequence of interactions that, (a) “transform a place or a localized resource into a category of material culture” called a “landmark”, and (b) “link single landmarks into an integrated network or landscape.” Zedeno however distinguishes between two approaches for describing and explaining landscapes “space-bound” which she says originates in a western conceptions of land tenure and “…where a researcher delimits an arbitrary space for the study
and then focuses on what is inside those arbitrary boundaries”, and “place-bound” approach which “…focuses instead on one object, then progressively describes its relationship with other objects”; she adopts the last approach (Zedeno et al. 1997; Zedeno 2000:106). Zedeno also makes use of analytical units such as “space” which involve a “discrete locus of human behavior or discrete locus of human--land interactions” (Zedeno et al. 1997:125; Zedeno 2000:106). “Landmarks” are locations markers where interactions and activities occurred, they can be altered or modified features, and remains a place of influence for later peoples (Zedeno et al. 1997:125). “Territory” is the “…total bounded space, wherein a broad range of human-land interactions takes place through time” (Zedeno, 2000:107). Finally, the largest unit of analysis in behavioral cartography is the landscape itself consisting of “…the web of interactions between people and landmarks” (Zedeno, 2000:107). Like Whittlesey (1998a), Zedeno (1997, 2000) uses two tools from behavioral archaeology, to “…understand how people transform spaces and places into culturally meaningful nodes on the landscape, connected through networks of behavior and meaning.” Zedeno (et al. 1997:126) also makes use of the three dimensions of landscape within her framework. For Zedeno (et al. 1997:126) the “formal dimension refers to attributes of landmarks, such as size, color, and location”; the “relational dimension is conceived as the interactive links (e.g., economic, social, and ritual) that connect landmarks to one another through the movement of people”; and finally “…the historical dimension consists of the sequential links that result from the successive uses of places.” The life history model refers to landscapes and everything occupying them as having life histories where developments result from human environmental interaction and landscapes go through cycles of change and transformation (Zedeno, 1997:126).

2.1.2 Indigenous Perspective

An indigenous perspective of the landscape can be expressed in many ways. Many researchers have articulated differences in worldviews between western scientific and indigenous communities as indigenous knowledge and alternative ways of knowing. It wouldn’t be a stretch to say that indigenous peoples are somewhat defined by their worldview. Equally one could postulate that ways of knowing are fostered within one’s communal landscape and directly influences the way in which people view their world and interact with it.
Suagee (1982:9-10) suggests that differences in religions point to differences in belief systems. Western religions are seen as “commemorative” because they trace their origins to a specific person or event such as Jesus and Mohammed, and tribal religions are described as “…continuing because they are a continuing process of creation” (Suagee, 1982:10). An appreciation and concern for the natural world Suagee (1982:10) says “…can be seen as one of the most significant common attributes of the different tribal religions – they share the realization that human existence is not possible without the natural environment, that the survival of human beings depends upon the survival of other living things.” Rituals come from an appreciation of mother earth as a living entity and giver of life. Suagee says (1982:10) “…there is an element of stewardship in the performance of such rituals because they are seen as necessary to ensure that the plants, animals, birds, and fish will continue to flourish and make themselves available for human needs…”, and “…the correct performance of these rituals requires the use of sacred objects made from sacred plants, animals, and minerals.” The manner of rituals and ceremonies often are strictly prescribed for the place and time in which they are performed (Suagee, 1982:10). Harris (2010:63) suggests that although there are many manifestations of indigenous cultures, “…there are surprising similarities in worldview, enough so that it is possible to contrast Indigenous worldview with Western worldview.” Harris (2010:63) quotes Gregory Cajete, an indigenous educator, as saying, “…there are elemental understandings held in common by all…derived from a similar understanding and orientation to life…”, and “…cosmologies differed from tribe to tribe, but the basic belief was constant.” Harris (2010:64) sees the animation of indigenous ways of knowing as a fundamental equality where western scientific thought sometimes rejects this, placing humans at the top of an evolutionary existence and religiously western tradition expressively places humans as having dominion over the earth. Holistically indigenous peoples are “…characterized by their conceptions of the interconnectedness of all life; perpetual movement of all through space and time; connection between the past, present, and future; and life and death as aspects of the same thing” (Harris, 2010:64).

Historical archaeologists in particular have been interested in how sites (places) and surrounding areas might reveal “Native peoples (sic) constructions of particular localities from perception and experience” (Rubertone, 2000:436). Rubertone (2000:436) explains that landscape research has revealed cultural differences of space and a better understanding of “…the role of place in Native peoples’ lives…”, and that “…the insights gained about native landscapes as active and animated
places steeped in names, memories, and routines have shed considerable light on why relationships to ancestral homelands have remained important.”

2.2 Chapter Summary

This chapter has charted the development of landscape perspectives in general, and in archaeology in particular. In the context of both western scientific and indigenous modes of thought, I view a “perspective” as the totality of understanding. Landscape understanding refers to the way each mode comprehends, identifies, and prescribes meaning to and within the landscape. Landscape meanings can be the actual meaning a landscape or cultural property invokes for an actor directly experiencing the landscape, such as symbolic or spiritual meaning, or they can be meanings an actor extends to others, such as passing of oral tradition, knowledge or information. In the context of a mode of understanding, a landscape perspective encompasses every aspect of its origin, influence, and practice.
3. Introduction: Historical and Ethnographic Research Methods

This chapter presents the conceptual framework and research component of the proposed method for investigation of cedar basket trees, along with an overview of previous research of CMTs. An overview of previous research of CMTs is presented to illustrate the value of a methodological approach and the archaeological implications of CMT research. The methodological research component centers on ethnographic and historical research contexts both globally and locally. Specific focus on Bitterroot Salish and Pend d’Orielle cultural traditions and the utilization of trees is presented as well. Archaeological contexts are discussed with respect to local histories.

The relationship between culturally modified trees and humans is well known. Early fieldwork was primarily focused on the application of dendrochronology and the development of ethnographic contexts of inner bark or cambium use. These early studies eventually led to the development of analytical frameworks for CMT studies (Mobley and Eldridge, 1992:93). Frameworks included ethnographic accounts, and spatial research focused on trail locations, population movements, hereditary ownership patterns in CMT locations, and technological and temporal investigation of tree scarring events (Mobley and Eldridge, 1992:93). Early work centered in coastal British Columbia, and the western United States and included studies that addressed CMTs in Montana by White (1954) and by Stump (1977). White (1954) used informants and ethnographic contexts for the investigation of cambium use by the Kootenai People. His study identified 47 living trees near Flathead Lake Montana and used dendrochronology to date the scars. Stump’s (1977) study in the Flathead National Forest focused on the use of the inner bark of trees. The documentation of CMTs and their ability to lead to anthropological inferences based on aboriginal use of cambium, dendrochronology, analysis of location and descriptive attributes demonstrated the significance of information CMTs could provide (Hollenbeck et al., 1980, 1984). CMTs have since been recognized as being eligible for the National Register of Historic Places (Mobley and Eldridge, 1992).

3.1 Identification and Utilization of CMTs

Many of the CMTs visible today are living trees and have been defined as intentionally altered by aboriginal people for utilization and traditional practices (British Columbia, Archaeology Branch, 2001:1). There are in fact a multitude of tree species and descriptive attributes that help
to identify the abundance of CMT types across the landscape. These can be identified through their functional and symbolic variability as to how, why, and what modification took place. Ethnographic information is utilized in this effort and helped in the identification of CMTs within certain specific geographical regions (Arcas Associates, 1984:7-12). Using ethnographic references and focusing on western red cedar CMTs, the characterization of social contexts and technological innovation has been attributed to many native cultural traditions. In the western United States and Canada, where cedar bark baskets are still being utilized, ethnographic references describe the time of year they are harvested, the time of year when they are most easily peeled, and the structure of harvest rights by villages and families (Mobley and Eldridge, 1992:94). White (1954:2) identified the use of specific trees used in Western Montana by local indigenous peoples for consumption including: the Ponderosa Pine (*Pinus ponderosa*), Lodgepole Pine (*Pinus contorta*), White Pine (*Pinus monticola*), and the Quaking Aspen (*Populus tremuloides*). Ethnographic research determined that the month of May was the best time for harvesting cambium because the sap was at its greatest point and which coincided with the traditional seasonal harvest of Bitterroot (White, 1954:2). Additional ethnographic observation of the Flathead (Bitterroot Salish) and Kootenai Indians revealed that cambium strips were carried and stored in cedar bark berry baskets and containers (White, 1954:6-7).

In *Culturally Modified Trees of British Columbia* (2001) CMTs are identified by their geographic region and the classifications that reflect their traditional uses. Identification of CMTs involves matching observable characteristics with already identified CMTs. The British Columbia Archaeological Branch CMT handbook classification is based on specific modifications of the trees themselves and divided into three main groups (classes): bark stripped trees, aboriginally logged trees, and others practices (British Columbia, Archaeology Branch, 2001:6). Scar morphology is used to divide and group CMTs according to physical characteristics observed in the field; these, in turn, can be correlated with functions “inferred through ethnographic analogy or replication” (Mobley and Eldridge, 1992:96). Temporal and spatial variation in cultural practices account for the differences in regional tree species and should be reflected in regionally specific morphological typologies for CMTs (Mobley and Eldridge, 1992:96). Morphological variability is a product of the technology used in the scarring of a particular tree species for a specific function. Because of this variability CMT morphologies and their typologies vary from region to region (Mobley and Eldridge, 1992:96). For example,
Eldridge (1982:5) noted that the Shuswap peeled the outer bark of the ponderosa pine from 18 inches wide to 1 ¼ m in length using bone, antler and wood wedges, and then pried it from the tree. The cambium layer came off with the bark. In contrast, in the eastern portion of the Columbia Plateau, the Coeur d’Alene Indians harvested bark from the lodgepole pine by hand, leaving scars indicative of a tree structure where cambium adheres to the inner tree (Eldridge, 1982:5). Research suggests that because ponderosa pine cambium was attached to the bark it was preferred to be eaten fresh and sometimes dried for winter use; lodgepole pine cambium could also be preserved and played a large role in subsistence (Eldridge, 1982:5; Prince, 2001:253).

Ethnographic and historical accounts indicate that the optimal time for cambium exploitation was in the late spring and early summer, because it was easiest to separate from the inner bark, the abundance of sap at that time, and its nutritional value and high sugar content (Prince, 2001:253). The absence of tree girdling which kills the tree has been noted by many researchers (Eldridge, 1982:5; Prince, 2001:253). Variability in harvesting practices suggests that traditional ecological knowledge may play a role in the subsistence practices of indigenous peoples, suggesting a hypothesis that sustainability was a consideration in these native practices.

The physiological response of tree scarring helps to identify distinctive CMT practices. As the tree heals, a characteristic scar remains notable by the lateral healing lobes. Callus scar lobes and tool marks are usually visible but can be hidden depending on the age of the scar, the size of the wound, and the growth rate of tree after scarring (Parker et al., 1992:3).

3.2 Ethnographic and Historical Contexts

The conceptual framework for understanding CMTs is based on empirical inquiry and field observation. My initial experience is likely typical of many: the observance of CMTs while conducting archaeological fieldwork stimulated my curiosity and for further understanding of CMT contexts, particularly the need to understand their cultural purpose both locally and globally. Section 3.2.1 focuses on global ethnographic and historical research contexts followed by local ethnographic and historical CMT contexts in section 3.2.2 and 3.2.3. A comprehensive ethnographic and historical account of the Bitterroot Salish and Pend d’Orielle peoples is accompanied by the published accounts of CMTs of symbolic meaning. Section 3.2.4 provides context of the use of cedar basketry among the Bitterroot Salish and Pend d’Orielle peoples. The
Bitterroot Salish and Pend d’Orielle are the focus here because their traditional homelands fall within the vicinity of the thesis cedar basket harvesting area field study.

3.2.1 Northern European Ethnographic and Historical Research Contexts

The regenerative capacity of trees and their ability to provide definitive evidence of human use can be traced back hundreds of years. Limitations for understanding the use of CMTs include the availability of living specimens available for study and access to CMT contexts within written and oral records by those with traditional knowledge. Because of the living aspect of much of the CMT population and the plethora of ethno-historical connections, archaeological inferences in large part are based on these understandings. For researchers, CMTs are a representation of the continued use of forest resources. They offer the possibilities for understanding cultural connections to those resources, and contribute to the formation of cultural landscapes (Turner et al., 2009:238). The intentional management of CMTs “…embody many cultural, historical, and economic manifestations of human environment interactions” (Turner et al., 2009:239). This environmental stewardship is present in most parts of the world, but it has been intensively researched in the Scandinavian countries of Sweden and Finland. Much of the Scandinavian use of trees has focused on the use of the innerbark of the Scots pine by Sami peoples, the symbolic nature of trees, and territory blazing (Ostlund et al., 2002:48). Ostlund (et al., 2002:48) suggests that CMTs provide clues about the cultural role of previous peoples and foster understandings of land-use patterns when using the proper context. Ostlund (et al., 2002:49) states that because of the continued presence of people throughout the boreal forest of Sweden, the occurrence of CMT sites must be “…regarded as a cultural landscape and interpreted as such.” In Ostlunds (et al., 2003) research of Sami settlements, historical sources were used to establish occupation within the Swedish boreal forest. Historical data were correlated with 118 dated CMTs ranging from 1721 to 1962 to establish characteristic Sami forest landscape patterns of trail and border CMTs (Ostlund et al., 2003:78). These historical imprints were well distinguished from other forest uses and established Sami presence and traditional family based reindeer pastoralism in the region (Ostlund et al., 2003:78-79). The implications of the study considered spatial and temporal recognition of Sami forest use, allowed for quantitative estimates of preindustrial impacts of Sami forest use, and established a cultural legacy which could be considered for future forest management practices (Ostlund et al., 2003:79). Corroboration of field studies with historical
and ethnographic context were taken from archival ethnological surveys, forest survey maps and records of land ownership, and aerial photographs to distinguish different types of forest stands around settlements (Ostlund et al., 2003:81-82).

Andersson (et al., 2005:149) looked at the symbolic use of Scots pine in the same boreal forests of Sweden, identifying 488 dendroglyphs, or carved trees, dating from the period between 1750 and the early 1900s. Historical accounts attributed the trees to traditional Sami herding practices which helped to establish certain themes which found that names were the most common dendroglyph (Andersson et al., 2005:149). Andersson (et al, 2005:149) say that these carved trees help to transmit spatial and temporal information concerning traditional knowledge; because of the uniqueness and their appearance this type of CMT serves as markers with high cultural value. Dendroglyphs are an expression of the experiences of people, their thoughts and feelings, and “provide a medium of communication…” they “…offer opportunities for obtaining insights into important relationships between humans and nature…” often lost in the industrial and land acquisition of later historic periods (Andersson et al., 2005:149-150).

3.2.2 Salish Ethnographic and Historical Contexts

This section presents the historical and ethnographic contexts for the Bitterroot Salish and Pend d'Orielle peoples. The aim is to provide background in the context of life for the Salish during the historic period. Because CMTs are composed mostly of living trees, the historic period is the primary focus for research contexts. Specific research focuses on notable occurrences of the Salish and Pend d’ Orielle people, that would have affected their traditional behavior and cultural practices such as harvesting strategies, settlement patterns, and spirituality.

Historical and ethnographic documentation for these people in the 18th and 19th centuries tells the story of assimilation, the introduction of infectious epidemic diseases, and hostile encounters with other tribes. The inability to access the Plains, to fight off epidemic diseases, and the destruction caused by assimilation had serious impacts such as limited bison procurement, high mortality rates, and culture loss. It is estimated that between 1780 and 1805 “at least half and possibly two-thirds of the native people of our region died from introduced diseases…” where “oral histories tell of particular bands from which only a single person survived” (Salish and Pend d’Orielle C.C, 2005:82). These imposing threats drove the Bitterroot Salish to the
Bitterroot Valley in Montana, where they concentrated their subsistence efforts. The introduction of the horse and gun added to major interruptions of life for the Salish. Before contact with the Lewis and Clark Corps of Discovery Expedition in 1805, there was minimal contact from the east by whites, although eastern influences had already reached far ahead of the masses of Euro-Americans. These influences created further competition between tribes for rights to trade routes, access to trade items, and hunting territories. Although the horse provided the Salish people with a new means of travel, excursions to hunting territories on the eastern plains was an extremely hazardous activity. Horses, guns, and alliances with Euro-Americans by other tribes had changed warfare patterns had altered the region: “By this time the Blackfeet and adjacent tribes had also adopted the horse-culture, and in addition, were being supplied with firearms and other articles by fur traders” (Schaeffer, 1937:228).

The Salish people were interested in power, or, as they would call it, ‘strong medicine,’ associated with the white people, which they attributed to spirituality. Towards the close of the fur trade period an interesting development was noted by white travelers in the Columbia-Snake region, where “The Flathead and adjacent tribes during the early eighteen thirties were observed to perform religious ceremonies compounded of pagan and Christian forms” (Schaeffer, 1937:229). Some scholars have attributed this phenomenon to that of the Prophet Dance introduced by Catholic Iroquois (Schaeffer, 1937:230). These are some of the first documentations of a spiritual augmentation. “With these were compounded practices of Christian origin, such as the observance of Sabbath and church holidays, genuflection and, less certainty, prayers for morning, evening, and before meals” (Schaeffer, 1937:230). The Bitterroot Salish viewed Christianity as medicine and a means to compete for bison resources on the plains. The Salish had Iroquois living among them who had come from the east with the fur trade, bringing the practice of Catholicism (Forbis, 1950:42). This was the beginning of a transformation, a melding of Christianity and Salish spirituality. Among these new spiritual transformations was the Prophet Dance, which had a strong resemblance to the Iroquois Christian beliefs and practices (Schaeffer, 1937:231). There is a story among the Salish that gave incentive to seek out what the Salish referred to as “Black Robes” which says, “A native who, while mourning in the mountains because of his wife’s death, was informed in a vision of the coming of the priests” (Schaeffer, 1937:231). Another story told of a young girl who had died, but on her deathbed gave warning of priests coming, and that the people should follow their instruction (Schaeffer, 1937:231). On the
spot of her deathbed there was to be built a house of worship. Some believe that the St. Mary’s Mission, which still stands today, was built on that site (Schaeffer, 1937:231).

After these affirmations and prophecies, the Salish began to consider sending a party to look for missionaries. Between 1831 and 1839 a delegation made up of Flatheads (Bitterroot Salish) and Nez Perce Indians traveled to St. Louis to seek out Christian missionaries (Forbis, 1950:1). In 1839 Jesuit missionaries were secured and a mission church was promised to be built in Salish territory. When Father De Smet arrived in 1840 he was welcomed with much warmth. This was attributed to the fact that the winter before, “A few Flathead had encountered a large force of Blackfeet on the plains, and in the ensuing battle fifty of the latter were killed without loss to a single Flathead” (Schaeffer, 1937:234). The Salish victory was seen as power provided by the church and was attributed to the coming of the Jesuits. With the presence of the church also came social customs, such as marriage and divorce. Many traditional customs were seen by the Jesuit priest as evil and primitive. Games that Salish had been playing for many years, if not thousands, were seen as a form of gambling, and were abolished. Marriage customs of the Salish which included the taking of multiple wives, was seen by the Jesuits as heathen and against the views of the church. “Flathead society approved of polygamy and did not frown upon frequent divorce” (Schaeffer, 1937:236).

Many things that had brought success during this time period were attributed to the introduction and power of the Jesuits, but as time passed dissention formed because new priests were less sympathetic, disease was killing significant numbers of Salish, Blackfeet attacks were becoming more frequent, and the church had favored the actions of French-Canadian trappers over the Salish (Schaeffer, 1937:237). These circumstances created a loss of faith and trust in the priests, and in Christian ways. Even with the profound modifications in Salish life the Jesuits could not stop the Salish people from returning to the old ways of Plains bison hunting. “Unable to assimilate the latter and fearing the threatened loss of bison hunting economy, the Flathead thrust aside the thin veneer of white culture for a return to the former mode of existence” (Schaeffer, 1937:250). The only white customs that were kept were those from what was left of the influence by the Iroquois.
In 1855 the Hellgate Treaty was signed at the place the Salish refer to today as Council Grove. This place, however, had longtime significance, and in the place name tradition, is called “Tree Limb Cut Off” (Salish and Pend d’Orielle C.C, 2005:44). This place was known for a special white chokecherry that grew there, good winter grazing for horses, and as a trail hub that led in many directions (Salish and Pend d’Orielle C.C, 2005:44). It was at this place where the Bitterroot Salish negotiated the settlement that ceded over a half million acres in exchange for the Flathead Indian Reservation. Chief Charlo, who was recognized as a the Head Chief of the Bitterroot Salish from 1870 to 1910, expressed his sense of frustration with the coming of the Corp of Discovery in 1805 and the course of treatment of the Salish to this point when he gave this speech in 1876:

> Since our forefathers first beheld him... [the whiteman] has filled graves with our bones...His course is destruction. He spoils what the Spirit who gave us this country made beautiful and clean. But that is not enough. He wants us to pay him besides his enslaving our country...and...that degradation of a Tribe who never were his enemies. What is he? Who sent him here? We were happy when he first came...To take and to lie should be burned on his forehead, as he burns the sides of my horses with his own name. Had heaven’s Chief burnt him with some mark, we might have refused him. No, we did not refuse him in his weakness. In his poverty we fed, we cherished him—yes, befriended him, and showed the fords and defiles of our lands...We owe him nothing. He owes us more than he will pay...His laws never gave us a blade of grass nor a tree nor a duck nor a grouse nor a trout...You know that he comes as long as he lives, and takes more and more, and dirties what he leaves (Salish and Pend d’Orielle C.C, 2005:88).

Although the treaty had created the Flathead reservation, the Salish for the most part remained in the Bitterroot valley. In 1887 the General Allotment Act was passed, which divided lands within the reservation designed to make Indians farmers and landowners. Once allotments were decided, families were encouraged to make use of them, a practice which seemed alien to the Salish and which went against every aspect of their existence. Meanwhile, the Salish living in the Bitterroot Valley had to contend with an onslaught of homesteaders moving in. Conditions in the Bitterroot were becoming intolerable for the Salish by the late 1880s, while at the same time the railroad had been constructed through Missoula and tribal lands “…with neither permission from the native owners nor payment to them” (Salish and Pend d’Orielle C.C, 2005:116). The culmination of the Salish stay in the Bitterroot came when Chief Charlo signed an agreement to leave in 1889, which was delayed and “In October 1891 a contingent of troops from Fort Missoula forced Chief Charlo and the Salish out of the Bitterroot and roughly marched our
people some sixty miles to the Flathead Reservation” (Salish and Pend d’Orielle C.C, 2005:116). In 1904 the Flathead Allotment Act extended surplus lands within the reservation to be available to white homesteaders, an act which was highly contested by the Salish and which directly violated the Hellgate Treaty, which says the reservation would be for “…the exclusive use and benefit of said confederated tribes” (Salish and Pend d’Orielle C.C, 2005:116). In 1910 the reservation was opened for homesteading and by 1934 under the Indian Reorganization Act homesteading was stopped, but as a result the reservation had been reduced and fragmented, transferring more than 540,000 acres to white ownership (Salish and Pend d’Orielle C.C, 2005:116-17).

Today the tribes have reasserted themselves culturally and politically by extending control over tribal government and tribal interests; reacquisition of tribal lands within the reservation has pushed tribal ownership to over 60 percent (Salish and Pend d’Orielle C.C, 2005:119). This has been made possible in part because of legislation such as the Self-Determination Act and the determined efforts of tribal representatives. Culturally, the Salish have had difficulty retaining their traditional ways, but under the supervision of the Salish and Pend d’Orielle Culture Committee the process of gathering oral histories and compiling a significant database of cultural documentation has served as a source of cultural determination. In the 1980s the Culture committee began a Cultural Resource Protection program “…designed to safeguard cultural sites on and off the reservation…”, and in 1996 the Tribal Historic Preservation Office (THPO) was started (Salish and Pend d’Orielle C.C, 2005:120).

3.2.3 Cultural Tradition and Medicine Trees of the Bitterroot Salish and Pend d’ Orieille

The Bitterroot Salish, having an intimate connection to their landscape gained over thousands of years from living in one place, timed the cycles of the camas and bitterroot plants, the ripening of berries and the return of the bison in the east. Fahey (1974:8-9) mentions the importance of the life cycle and that the Salish, while seeking their primary food source (bison) had to supplement their diets by timing the gathering of roots and berries. “The yearly cycle of the Salish and Pend d’Orielle people was based on a deep spiritual connection to the land, on a finely honed ability to care for and harvest its bounty, and on an intimate knowledge of its fluctuating cycles across seasons and years and even centuries” (Salish and Pend d’Orielle C.C, 2005:32). The Missoula
and the Bitterroot valleys were favorite gathering places of the Bitterroot Salish and knowledge of these cycles was necessary for the survival of the people (Salish and Pend d’Orielle C.C., 2005:19-22).

Salish world view and ways of knowing are equally ingrained with spirituality and traditional knowledge, and are carried and passed down through oral tradition. The Salish people believe that they have occupied their homelands from the beginning of time, sometimes referred to as “Time Immemorial”. Their creation is attributed to Amotken, “the big spirit above”, the creator of the sun and everything on earth. Amotken, however, did not create a perfect world. They believe their world was once full of monsters and giants, also known as “people-eaters”, little people and animals (Salish and Pend d’Orielle C.C., 2005:7). Left behind today are the remnants and reminders of these giants and monsters and of past events that tie the Salish people to their landscape (Clark, 1966:64-70). Coyote is a principle character in most Salish oral creation stories and the protector of the Salish people. Coyote was to be Amotken’s special helper, and who would rid the world of giants and monsters. “Coyote made the world safe for the people who were yet to come. He prepared the land and made it good. He showed us how to live, and the consequences of both good and bad behaviors” (Salish and Pend d’Orielle C.C., 2005:7). These creation stories tell of Coyote, who travels from the Jocko Valley and south to the Missoula and Bitterroot Valleys, where he rids them of the giants and monsters along the way. The stories of Coyote and other animal people teach about traditional ways of hunting and fishing, places for gathering foods and medicines, making tools and weapons, music, proper ways of raising children, relationships between people, spiritual dimensions of the world, and relationships with animals and nature (Salish and Pend d’Orielle C.C., 2005:7). These stories tell of Salish origins and how the people are tied to particular places on the landscape and hold traditional place names (Salish and Pend d’Orielle C.C., 2005:7). “Coyote stories, in short, are both the great spiritual literature of the Salish and Pend d’Orielle people, and also a reflection of the length and depth of the collective tribal memory, which reaches back to the distant beginnings of the people’s history” (Salish and Pend d’Orielle C.C., 2005:8). These creation stories speak of a tenure extending back to the last glacial event in North America that created what is known as Glacial Lake Missoula where, “In many of the tribal creation stories, we find uncanny parallels with the findings of scientists regarding the end of the last ice age” (Salish and Pend d’Orielle C.C., 2005:8). Although this tenure has been disputed in many cases by the scientific
community, new evidence of continued occupational site locations have been recorded in areas like the confluence of the Flathead and Clark’s Fork rivers, and in lithic scatters along the known shoreline of Glacial Lake Missoula (Salish and Pend d’Orielle C.C., 2005:8-9); as discussed below, the hypothesis that Salish and Pend d’Orielle origins in the region could date to the Pleistocene is receiving increased attention by archaeologists.

The story of the Ram’s Head Medicine Tree illustrates just one of these creation stories. In the oral tradition, Coyote encounters a Ram that has been terrorizing anyone who attempts to pass his way. Through the Coyote’s superior intellect and the help of Meadowlark, he is able to trick the Ram into charging him. At the last moment Coyote moved and the Ram struck the tree where he was incased for all time (Salish and Pend d’Orielle C.C., 2005:73-74). The spiritual importance of this story forever connects the Rams Head Medicine Tree and that place to the Salish People. The importance of the tree and the story tells the Salish how they should treat that place (Clark, 1966:78-81).

The Ram’s Head Medicine Tree is a point on the landscape located at the very southern end of the Bitterroot Valley in which the Salish have passed on their journeys to the east to hunt bison, always leaving an offering for safe passage and success. The consequences of how the Salish acted in that place, they believe severely affected the outcome of their journeys. The Nez Perce, who were allies of the Bitterroot Salish, also knew of the Medicine Tree and often treated it with the same respect as the Salish. In one story a Nez Perce warrior who was traveling with the Salish on their way to hunt bison fired a rifle ball into its trunk. Once they had reached the eastern plains, the Nez Perce warrior while running alongside the bison fell on his horse and was killed. The Salish say that he spoiled his luck by mistreating the Ram’s Head Tree (Weisel, 1951:8).

The Bitterroot Medicine Tree has had other mishaps throughout its life time. H.W. Lord of Darby, Montana says that the reason the ram’s head is not visible today is because of some “vandal” who cut off the exposed part of the head (Weisel, 1951:9). Some dispute the location of the tree itself, but those who have been visiting the tree for many years contest the idea and recall many events of visiting themselves or hearing their relatives tell stories of the Ram’s Head Tree.
Ellen Bigsam recalls visiting the Medicine Tree as a child and hanging her hair on it for luck (Weisel, 1951:9).

The example of the Ram’s Head Tree is instructive, because it was a common practice of the Bitterroot Salish to recognize certain trees as powerful. Other Medicine trees have disappeared with little knowledge of their precise locations, but the oral traditions have survived and tell of the importance of these places. One story tells of the importance of possessing medicine or what the Salish call in their language, *Sumesh*. The story tells of a medicine tree in Hellgate Canyon just east of the current city of Missoula, called Medicine Tree Hill. This canyon was known as a passage to the east and was often used by the Blackfeet to ambush travelers, hence the name Hellgate Canyon. The story tells of a warrior being outnumbered and pursued by the enemy. He went up the hill to get away and rest. He hung his medicine necklace on a tree and soon fell asleep. He awoke to hear the war cries of the enemy who had discovered his hiding spot. A battle commenced and to the surprise of the Salish warrior and the enemy (Blackfeet), no arrow had touched his body; they even seemed to fly away from him. This was discouraging to the Blackfeet warriors and every arrow shot by the Salish warrior killed an enemy. One of the Blackfeet observed the events and saw the medicine necklace hanging on the tree. The enemy warrior scrambled up the hill and grabbed the powerful necklace. The very next arrow shot by the enemy struck the Salish warrior and killed him. Afterwards, young men who passed by this location left something personal on the tree so as to avoid consequences and gain strong medicine and safe passage. The tree was eventually cut down and the location lost to memory (Weisel, 1951:13).

Another story tells of a Medicine Tree located south of Ravalli Montana and North of Arlee. This was a large pine tree where the Salish left offerings for success. They would cross this area when traveling in either direction. Those who would pass would shoot arrows into the upper part of the tree, sticking them into it. At one time one could see hundreds of arrows stuck in the tree. When the reservation was opened for homesteading in 1910 the man who owned the property cut it down and today the location is a mystery (Weisel, 1951:12). Another important medicine tree was located on the west slope of Mount Jumbo on the outskirts of present day Missoula Montana. The locals called it Sentinel Pine and recall that during stick games and horse races the natives would visit the tree for good luck. Both winners and losers would climb and give thanks
for success or ask for it. It was not uncommon for someone to stay for days or until they received their medicine (Weisel, 1951).

3.2.4 CMTs and Cedar Baskets of the Bitterroot Salish and Pend d’Orielle Peoples

The use and harvesting of cambium amongst the Bitterroot Salish and Pend d’Orielle was observed in the Flathead and Arlee valleys by early researchers such as Carling Malouf, although the practice seemed to be lost to memory for much of the Salish population in the area (White, 1954:8). The remnants of this practice are evident at harvesting areas in multiple locations in Western Montana. I have observed and documented many of these locations. The use of the cedar for tribal peoples of the Northwest Coast, Columbia Plateau and western plains is well known, although there is limited research and documentation of the use of cedar for tribes on the eastern portion of the Plateau. The use of cedar was highly variable amongst tribal peoples in the region and, with a broad contrast in its utility from the west coast, where cedar was plentiful, and to the east, where cedar became less available. Where available, cedar played a vital role in culture and was utilized for basic needs such as clothing and shelter, and spiritual needs for ceremonies and artistic expression (Stryd and Feddema, 1998:4). According to Teit and Boas (1930:329) the Spokane and Flathead Salish made the fewest bark baskets of Eastern Salish tribes, compared with the Kalispel (sic) and Pend d’Orielle, who made the most. This was attributed partly because of the environment and arid climate of the Western plains where cedar was not in abundance and only available in forested areas (Teit and Boas, 1930:329).

The utilization of bark baskets depended on who was making them and the purpose they were made to serve. Many cedar baskets were made for temporary use such as for berry baskets, and consisted of a single piece of bark folded in the middle with the sides sewn, and a round hoop stitched inside the rim to keep the mouth open (Teit and Boas, 1930:52-53). Cambium strips from the harvesting of other trees such as the ponderosa and lodgepole pine were stored in cedar bark baskets as well as used for transport (White, 1954:6). Other types of cedar baskets constructed with different techniques, were made for storage, and as dish containers made for holding melted fat, for catching bone marrow, and for holding miscellaneous items (Teit and Boas, 1930:52-53). The Kutenai (sic) people, who are not a Salish people but share many customs and territories of the Eastern Salish peoples, also used the cedar bark basket for gathering and storing berries (White, 1954:7). The bark of younger cedar trees were preferred
and more suitable for this purpose, while the largest containers that were observed held no more
than two gallons, and sometimes was lined with a layer of pitch for holding liquids (White,
1954:7).

3.3 Archaeological Contexts

As explored in the previous chapter, the archaeological landscape can be understood by
investigating the cultural history of those who have occupied it (Black and Jolly, 2003:72).
Archaeological contexts are discussed here because they provide background information outside
of the historical and ethnographic research contexts.

Indigenous habitation in Montana extends at least 11,000 years before present (MacDonald,
2012:1). Hunter-gatherers traditions based on cultural chronologies such as that of George C.
Frison, are divided into specific time periods from the Paleoindian (11,000 to 8,000) to the
Historical period (300 to present) (MacDonald, 2012:1). As evidenced in MacDonald’s Montana
Before History (2012), much of the work conducted in prehistoric archaeology focuses on the
environment, hunting and gathering traditions, stone tool manufacture and technology, and rock
art.

My research is ultimately concerned with the archaeological context of CMTs and therefore is
bound by temporal boundaries of that investigation. Because of this, discussion of the Late
Prehistoric period, from 1500 to 300 years ago, and the historical period, is of primary interest in
my research. This period is characterized by the dominance of bison cultures in the subsistence
round; supplemental subsistence varied but consisted mainly of hunting deer, elk, sheep, fishing
and the gathering of roots and berries (MacDonald, 2012:5). This period also is characterized by
the beginnings of bow and arrow technology and the continued use of bison drives and jump
sites, as well as the beginning of villages on the Columbia Plateau, trade and increased resource
competition (MacDonald, 2012:5). Archaeological evidence of skeletal trauma during this period
suggests the level of competition and violence was more frequent than earlier periods
(MacDonald, 2012:5).

Determining ethnic origins in the prehistoric past is famously difficult. However, the similarity
of culture and language with other Salishan speaking tribes coupled with archaeological
investigation places the origins of the Salish and Pend d’Orielles peoples within the interior of
the Columbia Plateau (MacDonald, 2012:155). Their tenure in western Montana may extend from the early Archaic period and arguably “…based on the continuity of use…” may even extend to the earliest period of occupation in the Americas (MacDonald, 2012:155). Salish and Pend d’Orielle territories once extended into British Columbia and Eastern Idaho, but as the historic period unfolded and an influx of European influence and the competition for resources grew on the plains, the reduction of traditional territories was the result (MacDonald, 2012:153-155).

### 3.4 Chapter Summary

The research methods and results presented in this chapter are components of the overall methodology for archaeological investigation of CMTs. The historical and ethnographic contexts of global and local CMT research has been reviewed, as well as local and regional histories of the Salish and Pend d’Orielle peoples. CMTs offer a unique opportunity in the investigation of traditional cultures as they represent temporal, spatial, and technological aspects of human behavior. The possibilities for anthropological and archaeological inferences are based in large part on ethnographic, historical, and archaeological research contexts. Specifically, these contexts help to identify who is responsible for local and regional CMTs. Archaeological investigation of temporal and spatial aspects of traditional cultural practices as well as regional and local specific CMT morphology is also based largely on these contexts. The what, why, and how will be discussed further in the following chapter with the presentation of the field study and survey and recording methods of the cedar basket harvesting site.
4. Introduction: Field Methods

Observation of CMTs in earlier archaeological fieldwork stimulated interest in pursuing further investigation and cultural understanding of the indigenous peoples of western Montana. After empirical observations and inquiry, many types of CMTs were identified. Given their uniqueness and potential for understanding traditional culture, I chose to investigate cedar basket trees as a research thesis project. The survey and recordation of an historical cedar CMT harvesting site located in the foothills of the Mission Mountain Range located on the Flathead Indian Reservation is presented here as a pilot field study based on its potential to contribute to the development of a method for inquiry and analysis of CMTs. The field study is utilized to illustrate what modifications took place, why they took place, and how they took place (Mobley & Eldridge, 1992:94). The importance of when the modifications took place is integral to the temporal and spatial elements of the thesis research. The who has been established through historical and ethnographic review which can be attributed to the aboriginal presence of the Salish and Pend d’Orielle peoples in the region.

A description of the cedar basket harvesting site is given below, but at the request of the CS&KT Culture Committee, mapping and identification of the exact site location is excluded. Permission to GPS each CMT was given although the recording of GPS coordinates became problematic; this is discussed in the recording methods section. The request to omit the study location is based on cultural sensitivity, for which the culture committee asked that certain information be omitted and the use of non-destructive methods be utilized. It can be said that the site has been subject to logging destruction and historical actions which cleared a large portion of CMTs and other trees for the development of Flathead irrigation projects. The cedar bark harvesting location studied here is a traditional use site that is still being utilized by tribal peoples.

4.1 Field Survey and Site Sampling

The collection of archaeological data is based on a variety of existing methods for surveying and sampling CMTs. A review of these methods is presented in the following sections and discussed within the context and presentation of the cedar basket field study.
Previous research on site sampling has addressed sampling schemes of CMTs and whether sampling schemes “can produce data which adequately represent the proportions and variability found within a CMT site from a scientific perspective” (Muir and Moon, 2000:1). Because CMT site boundaries are not so consistent and evident, spatial definitions of archaeological sites and CMT sites differ when defining site boundaries, as CMT sites are discretely distributed across the landscape; therefore CMT sites here, as defined by Muir & Moon (2000:2), “refer to any archaeological site containing one or more CMTs.” Prince’s (2001) study of Carrier people’s cambium in Nechako River drainage British Columbia employed a study sample of CMTs that identified individual harvesting areas, and sampled individual CMTs within for dating. The sampling strategy used two approaches; the first was to collect cores from one tree every 100 meters, the second was to core every living tree within a corridor of CMTs (Prince, 2001:257). In each case the sample proved sufficient to assess temporal and spatial variability (Prince, 2001:257). Andersson’s et al., (2008:463) study of CMT inventory strategies developed a two-step approach; the first was a complete inventory of all CMTs within a defined area for survey, and the second was to divide CMTs into subpopulation for circular plot sampling and strip surveying, both of which seem to be common approaches to sampling CMTs.

The goals of my survey were to define the site boundaries and identify every cedar CMT within the boundaries for intensive data collection. Ostlund et al., (2005:317) employed a similar approach in their CMT study in the Bob Marshall Wilderness Montana, following protocols in the CMT handbook (Eldridge, 1997; and Stryd, 1997), which began with an initial reconnaissance survey to identify potential sites and CMTs for data collection and recording. Spatial clustering of cedar harvest trees and their location relative to water were considered in my survey, which helped to define the site boundaries of the cedar basket harvesting site. The site boundary was determined by reconnaissance survey of the entire cedar grove and identifying every possible location which might contain cedar CMTs. The arbitrary boundary of the site contains all known and identified cedar CMTs in the cedar grove. The site sits within a canyon between two ridges running east and west, which is ideal for the growth of western red cedar. The site location is bordered by a creek on the south side and sits between two modern camp sites on its east and west edges; the boundary on its north side is bordered by a steep slope and dirt road. Recorded basket trees are confined to these boundaries, although there are a few recorded red cedar basket trees above the road on the northeastern boundary.
Mobley and Eldridge (1992:103) consider the distribution of western red cedar’s natural range and the distribution of CMT samples based on spatial clustering, where researchers must distinguish CMT clusters from isolated and individual CMTs. This approach recognizes the problem of defining site densities of CMTs and the use of arbitrary distances to delineate sites from one another (Mobley & Eldridge, 1992:103). To help quantify CMTs on the ground they suggest the use of transect surveys and explicit methods for identifying, comparing, and discussing CMT densities (Mobley & Eldridge, 1992:103). Spatial correlations can then be made, such as the relationship of cedar and their distance from water (Mobley & Eldridge, 1992:104). Environmental conditions are considered with respect to the selection of CMTs and scar orientation (Mobley & Eldridge, 1992:104). The selection of scarring and their orientation can dictate the spatial distribution of CMTs (Mobley & Eldridge, 1992:104). This was noticed by Arcas Associates (1984:73-78) where the selection of scarring was correlated with the steepness of slope, and where it was also noticed that the upslope side of trees had fewer branches because of their location relative to the sun and absence of sun light.

Eldridge (1982:15) suggested other types of archaeological features should be correlated with CMT sites; in particular, cambium harvesting sites might be associated with habitation sites, processing sites, and trail corridors. This can be accomplished by background research of known archaeological sites within the vicinity of harvesting sites. My field work considered these associations within the parameters of the survey and within site the vicinity which might correlate with the cedar basket harvesting site. These associations include traditional plant communities like berry patches, traditional camp sites, and trails. The local area is known to have huckleberry patches and the Mission Valley was known as a prime camping area for both Pend d’Orielle and Salish peoples.

4.2 Data Collection and Recording Methods

Data collection is based on several approaches to recording CMTs. The goal of recording was first to identify every CMT within the harvesting site and record the attributes that best represent the activity of basket harvesting. The attributes recorded are based on a variety of observable characteristics of cedar basket trees which help in the analysis of temporal and spatial studies, and morphological variability. Attributes used in recording were borrowed from Culturally Modified Trees of British Columbia: A Handbook for the Identification and Recording of
Culturally Modified Trees, and followed protocols for recording these attributes (Stryd, 2001:103-123). These attributes included: Diameter at breast height (DBH), Slope (SLP), Length (LEN), Width (WID), Thickness (THK), Height above ground (HAG), Side (SDE), and Toolmarks (TMK) (Stryd, 2001:103-107). Descriptions of these attributes were utilized to characterize cedar basket attributes for recording and as suggested by the handbook were expressed in centimeters (Stryd, 2001:103). Observations of tree characteristics helped to determine the point of measurements for attributes. Length and Width of the scar were very apparent although it was visible that cut marks on the lateral and vertical edges had a tendency to stretch over time. Length and Width were measured from edge to edge at the center of the scar. The attribute Area (Area), was determined by multiplying Length and Width divided by two. The decision of dividing the Area by two was determined by ethnographic reference and with consideration of how cedar baskets are made from a folded segment of bark. The attribute side SDE was used, although the description was changed slightly to accommodate the side of the scar in relation to its compass orientation, rather than the description suggestion of the scar relative to the tree or another feature (Stryd, 2001:107). The term feature in this thesis refers to each CMT, which is slightly different than the use in the British Columbia, Archaeological Branch Handbook (Stryd, 2001:107), which refers to the scar itself as a feature and not the tree. Of the trees surveyed, only one CMT had more than one scar. Every CMT received a feature number based on the date (i.e./month, day, and year, 010103-01) of recording followed by a number order for which each CMT was recorded. A description of the condition of each feature (single CMT) was recorded and its position relative to the survey boundaries. Boundaries included the upper campground, the creek on the south boundary, and the road on the north boundary. Descriptions of every CMT were recorded, and their relative positions in relation to arbitrary boundaries were recorded because of the inability to obtain GPS readings. This was partly due to the thickness of the over-story of existing trees within the harvesting site, which hindered the capabilities of the GPS to receive satellite signals. Three photographs were taken for every CMT scar and recorded on each attribute sheet. Photographs help to identify individual examples, and make visual inferences and comparisons between CMT features. Photographs and attribute recording sheets for each CMT feature are available in Appendix B.
4.2.1 Dendrochronology Methods

Dendrochronology has been the preferred method for dating CMTs (Mobley and Eldridge, 1992:98) and was utilized in my field data collection to date the age of the scars on each basket tree. One general technique for dating includes taking one core from the scar face to the pith and one from the outer bark to the pith, and then to subtract the difference of the counts to date the scar (Eldridge, 1982:18). Another method is to take a notch or cut a disk in the edge of the scar and to date the rings by observing the date of trauma and counting annual rings to the outer edge of the tree (White, 1954:8; Mobley & Lewis, 2009:263). The removal of a disk is usually accomplished by the use of a chainsaw which results in the death of a tree. Pegg’s (2000:79) study suggested that the method of using disks cut from the scar was accurate to within plus or minus five years for scarring dates. Methods have been developed to date both the age of the tree and date of the scar, however, my field recording concentrated on the age of the scar only by coring through the annual lobes toward the scar crust (See Figure 1). To accomplish the goal of collecting cores for temporal analysis, the use of an 18 inch, 5mm Finish Suunto increment bore was used. Because of the range of techniques for dating scarred trees, I opted for a method that was the least invasive and destructive, and which had no need for the use of master regional chronologies. Master regional chronologies can help in dating CMTs; however this is not always necessary when dating live trees (Mobley and Eldridge, 1992:98). My method used direct ring counts which Mobley and Eldridge (1992:98) say is possible because of the nature of the healing process for this type of cultural modification which results in the ability to count rings in the callus lobes. “By counting the growth rings adjacent to the scar, and relating them to the scar layer, the years passing since the scar was made can be determined” (Mobley and Eldridge,
Parker et al. (1991:2) utilized this non-destructive method to age CMT cedar scars. This was accomplished by coring directly through the callus lobe adjacent to the lateral scar face, and designed to “…intercept inter-annual trauma cells formed at the time of the injury.” By establishing the point of the scar and counting annual rings to the outer bark on the callus lobe, the year of scarring was established (Parker et al., 1991:4). Parker’s (et al., 1991:4) study focused on temporal corroboration of berry basket harvesting and the identification of the seasonality of berry harvesting, and where they established the year of the scar relative to the growing season. Mobley and Eldridge (1992:99) tell us that it is possible, even if the scar face is eroded, to determine the age of the scar. This is because the trauma corresponding to the age of the scarring results in characteristic ring morphology such as high density latewood and expanded earlywood (Mobley and Eldridge, 1992:99). When cedar bark is removed and the sapwood surface is exposed, this results in killing the cambium layer responsible for the growth of annual rings; healing lobes form on both of the lateral sides and lobes begin to cover the exposed sapwood and dead cambium (Pegg, 2000:79). A scar crust is visible between the exposed sapwood and dead cambium layer (Pegg, 2000:79). Pegg (2000:79) also says the healing lobes may eventually close the scar face; however, most cedar CMTs have a substantial scar window.

Like the method of using disk samples for dating, the use of callus lobe cores locates the scar crust in the sapwood between the scar and the healing lobe, and counts rings from the outer bark to the scar crust (Pegg, 2000:79). Before this can be done, cores were collected in the field. Field methods utilized the use of several tools for collection. A mentioned above, an 18 inch, 5mm increment bore was used for coring. One quarter inch (1/4) by 20 inch clear straws were used to house the tree cores. The delicate task of transferring tree cores to the straws was accomplished by the use of an assistant. The technique for coring was to pick one of the lateral callus lobes for coring. Each core sample was taken in the center of the lateral edge near the observable cut edge of the basket scar (See Figure 1). The depth of the outer lobe to the scar face was measured on the side of the callus lobe where the core sample was taken. This was to assure that the scar crust (Figure 4: The arrow points to the scar crust (Pegg, 2000:79).)
2) compared measurably to that of the depth of the core from the outer lobe to the scarring event. This technique allowed for a comparison of scar depth with the point of each scarring event; this helped to assure annual ring count accuracy. The depth of core samples were based on the depth of the scar and avoided boring too close to the center of the trees to avoid center rot. All core samples were taken in the month of August and displayed a moisture content that caused the cores to expand once removed from the tree. Because of this, cores were immediately transferred to the straws. Core sampling was done with a relative ease, taking notice not to rush when turning the increment bore which could result in core breakage. Once the desired depth was reached, the increment bore was turned one quarter turn in reverse to break the core; this helped when extracting the core sample. Cores samples were labeled by date and feature number immediately after coring.

Annual ring counts were determined in a controlled environment using a magnifying lens. Magnification was needed to discern annual rings from one another and to identify the scar crust and point of scarring. The scar crust in every case was apparent to the naked eye although magnification added confidence in ring counts. The method was to make a rough count based on a plus-minus system of 5 annual rings per core sample; this was necessary because of distortion in observable annual rings. All core samples were photographed for a visual record.

### 4.3 Analytical Framework

Introduction of the theoretical framework and a presentation of two potential models for archaeological investigation and analysis of cedar basket trees have been presented. This section expands upon the analytical framework first by a presentation of a behavioral approach to landscape archaeology, and by highlighting the fine points valuable for interpretation of cedar basket trees.

I am interested in the formation processes of landscapes. The use of Heilen’s (2005, 2008 et al.) studies, as highlighted by Hollenback (2010), demonstrates the usefulness of this approach for interpretation. First, artifact and behavioral based models for landscape formation processes are needed to explain archaeological landscapes (Hollenback, 2010:188). Formation processes are relevant to archaeological investigation which help in the “…formulation of research questions, design of surveys, and the collection, analysis, and interpretation of data” (Hollenback,
This approach distinguishes between archaeological landscapes which consist of “…arrays of artifacts, features, deposits and sites…” and systemic landscapes which are “…networks of people, places, materials, and activities…” and connected through the exchange of “…information in a behavioral system” (Hollenback, 2010:188). The archaeological landscape here is the cedar basket harvesting site, consisting of its CMT features. The systemic landscape here is the network of people and the activity of cedar bark basket harvesting. Archaeologists study archaeological landscapes and their formation processes to make inferences about systemic landscapes (Hollenback, 2010:188). The development of landscape theory allows for exploration of “…the relationships between past systemic landscapes and current archaeological landscapes” and how they have been transformed over time (Hollenback, 2010:188). Heilen’s et al. (2008) framework involves scales or dimensions including spatial, temporal, and behavioral, where spatial consists of two variables, extent and grain, where the “extent is the absolute size of the study area or landscape, and grain is the absolute size of the smallest unit” (Heilen et al. 2008:603). The temporal scale, considering archaeological phenomena, is understood in terms of span, the absolute time, and interval the smallest unit of time (Heilen et al. 2008:603). The behavioral scale or dimension is split up into interactions, activities, and behavioral systems (Heilen et al. 2008:604). Interactions are the smallest behavioral scale referring to “…discrete mechanical, thermal, chemical, acoustic, or visual interactions between people and materials”, activities “…are at a slightly larger scale and consist of a finite number of interactions carried out by individuals, households, and task groups”, and behavioral systems are networks of activities, all of which are scales of human behavior that “…occur on the landscape and modify landscapes in systemic contexts” (Heilen et al. 2008:604). As the name of this approach implies, it emphasizes observable and measurable behavior within abstracted space. The theoretical framework presented here provides a basis for analysis of cedar basket harvesting sites at scales that are representative of their place within archaeological and systemic landscapes.

Statistical analysis is derived from procedures that look at relationships between variables. IBM’s SPSS Statistical Data Editor was used to compile data and chart specific relationships between cedar basket tree attributes for determination of the strengths and weaknesses between them. Histograms and scatter plots were created for visual representation of statistically relevant relationships of physical characteristics observed on cedar basket trees. Intensive statistical
analysis is not the goal of this thesis, although numerical data was generated with the potential of future research and statistical analysis, particularly for comparative and regional studies; the collected data are found in Appendix A (Appendix A for Attribute Table and Statistical Data).

This framework makes use of historical, ethnographic, and archaeological contexts for data comparisons with Archaeological and Systemic landscapes; allowing for interpretations and inferences to be made about systemic landscapes.

4.4 Field Results, Research Questions, and Hypotheses

This section presents the research questions, hypotheses, and results for the pilot field study. Specific relationships between morphological variables of cedar basket trees are identified and presented. Hypotheses are based on specific relationships between morphological attributes and variables of interest. Two hypotheses are given for the comparative investigation of these relationships: the main hypothesis which states there is a general statistical dependent relationship pattern among the variables being compared, and the null hypothesis which states the variables are random in their relationship. Analysis of the relationships between variables is based on statistical histograms and scatter plots, which are sufficiently robust to allow for a rejection of the null hypothesis. Field results and data analysis focuses on the investigation of the temporal aspects of cedar baskets harvested over time (Model A) and by the comparisons of several distinct harvesting attributes (Model B) to see if certain patterns emerge. This framework allows for the thesis research questions of: what, why, and how modifications took place at cedar basket harvesting sites to be addressed. The importance of when and where the modifications took place is integral to the temporal and spatial elements of CMT research.

The strength of association of the cedar basket harvesting relationships is presented here with respect to research questions and hypotheses. Statistical relationships are discussed using visual representations of histograms, scatterplots and trend line graphs. A brief discussion is presented for each attribute or pair of attributes; more discussion is presented in conclusions and implications of the research. Analytical interpretation and discussion of results are based on frames of reference presented in historical, ethnographic, and archaeological contexts, as well as by the landscape theoretical framework.
Hypothesis 1: Temporality of Basket Harvesting, Age of Scar (AOS) and Area

This hypothesis examined here is to illustrate the investigative possibilities of Model A. A comparison of cedar baskets harvested over time with the attribute component of Area was undertaken. In addition, the temporal distribution of harvesting events is also important; it has been established in earlier chapters that the temporal pattern of harvesting of CMTs helps to distinguish demographic patterns of regional occupation and settlement, as well as subsistence patterns which consider group organization and harvesting strategies. Further, historical and ethnographic contexts have been identified for the indigenous populations of Western Montana and the specifics of their demographic trends with respect to prehistoric and historic periods. Ethnographic contexts equate the harvesting of cedar baskets with the subsistence practice of berry harvesting, and storage of berries and tree cambium. Based on these contexts, temporal and spatial investigation and research objectives seek to understand the relationship between the number of baskets produced over time compared with the size of baskets. A representation of basket size was based on ethnographic descriptions of cedar basket construction. This variable is represented by multiplying basket Length (LEN) and Width (WID) divided by two; the attribute component of Area is the representative result. Therefore the research hypothesis states that the frequency of baskets harvested compared with basket size (Area) is an indicator of demographic group aggregations, and the harvesting strategies of local subsistence resources.

Hypothesis 1 is presented for temporal and spatial investigation of cedar basket trees and indicates a limited temporal period. Figure 3 shows the amount of baskets harvested over time. Harvesting is delineated by five year periods. Field results included the recording of 33 CMT features and 34 scars. Feature number 8 had two scars while the rest of the features only had one
scar per feature (see attribute table, Appendix A).

Figure 3: Number of trees harvested (Frequency) by age of scar (AOS).

The scatter plot (Figure 4) shows the Area of each basket harvested by the CMT feature harvesting date. Although time is clearly not the only factor affecting area, the trend line indicates an early preference for baskets typically with a larger area, decreasing in size as the age of scars also indicate. The figure indicates both the grouping of certain harvesting events and the scattering of harvesting events. Viewed from a subsistence economy point of view, this might be an indication or represent group or individual behavior related to bark harvesting for baskets, and therefore an indicator of group aggregations of local occupation or settlement, potentially related to berry harvesting. The spikes in harvesting
events could also be an indicator of subsistence organization and harvesting strategies; although the likelihood of relating hypothesis 1 to demographics and subsistence behavior in this case is very low considering the limitation of temporal data, a time frame that is late twentieth century, when it is likely that traditional demographics and subsistence activities have been replaced with modern forms. Given the relative recent dates of these harvesting events, and the availability of commercially made containers, production of cedar baskets is most likely related or linked to social factors such as the revival of traditional technologies.

The following hypotheses (# 2, 3, and 4) are provided for morphological investigation (Model B) of harvesting behavior. Empirical observations in the field led to my interest in identifying whether specific relationships exist between certain cedar basket harvesting attributes. These are presented below.

**Hypothesis 2: Length (LEN) and Width (WID)**

Again, ethnographic contexts provide explanations of basket construction where the desired Length of a basket is to be long enough to fold in half. However, the ethnographic contexts don’t provide preferences in basket Width. Through empirical observation, it is assumed that the optimal Width of a basket must be wide enough for the human hand to access the contents, however this is only presumed. The hypothesis here states that there is a functional and optimal relationship between basket Length and Width; the result of this relationship should be observable and evident by a general pattern of which Length is longer than Width.
The scatter plot (Figure 5) suggests there is a statistical relationship to Length and Width. The pattern implies that as the Length of baskets increase so does the Width. Outliers exist above the trend line, which show an equivalency between Length and Width in some harvesting instances, although the general trend suggests Length is generally longer than Width at the time of harvesting. The scatter plot below (Figure 6) looks at the age of scars (AOS) in relation to Length and Width. A pattern is revealed that suggests the general distribution of Length and Width decreases over time.

![Figure 6: Age of scar compared with Length and Width.](image)

**Hypothesis 3: Age of Scar (AOS), Diameter at Breast Height (DBH), Length (LEN), and Width (WID)**

I am interested in whether a functional relationship exists between DBH, Length, and Width. Interest here is based on whether there is an ideal tree diameter preferred by those harvesting cedar baskets. It is noted that DBH, Length, and Width are not exact in the sense that it is not possible to determine their precise measurements at the time of scarring. Based on this inadequacy, DBH, Length, and Width are only presented as representations of them at the time of the scarring, this is observable within the data. Figure 7 indicates that as the DBH of each tree
increases so does Width, and does length—although the $R^2$ value for length suggests the trend is very weak.

![Graph showing Diameter at Breast Height (DBH) compared with Length and Width.](image)

**Figure 7:** Diameter at breast height (DBH) compared with Length and Width.

Ethnographic contexts explain the existence of an ecological awareness for which the scarring of a tree avoids girdling which kills the tree. The avoidance of girdling was observed in the field, and only one tree had multiple scarring events located on the same side of the tree. All other trees exhibited only one scarring event. Therefore, the hypothesis states that there is an optimal tree diameter for harvesting of cedar basket trees and which compliments the Length and Width of a basket cut; this is compounded by the ecological sensibility and treatment of scarred trees. This is noticeable by a patterning of DBH to Length and Width and represented by the comparison of scarring events (Figure 8).
Figure 8: Age of scar compared with DBH, Length, and Width.

Figure 8 shows that the general pattern of DBH to Length and Width decreases overtime. It also displays a general pattern where the DBH of each CMT is relative to Length and Width. The decrease in diameter for later scarring events may be a representation of natural growth where older scarred trees should naturally have larger diameters. But, given that the range of dates is only a few decades, it is also possible that preference is being measured here, with larger trees harvested first. The trend line graph in Figure 9, displays the relationship by feature number. It supports the observation that DBH is related to Length and Width for each scarring event, although it is equally clear that for any single feature, the variables are not always matched.

Figure 9: Trend line for Length, Width, and DBH.
Another way to display the relationship between DBH and Length and Width is to combine Length and Width into Area. Figure 10 displays this relationship and also indicates a pattern of increase in Area as the DBH increases.

![Figure 10: DBH compared with Area.](image)

**Hypothesis 4: Age of Scar (AOS) and Orientation (SDE)**

I am interested in the relationship between scarring events and the Orientation of the scar on the tree. Ethnographic and archaeological contexts have noticed that some CMTs have symbolic representations, while others have observed a functional preference for basket cuts based on the lack of tree knots. Therefore, the hypothesis states that a preference in Orientation is representative of a symbolic decision for scarring; the null hypothesis would be that the lack of preference for Orientation would suggest a functional decision for scarring. The histogram in Figure 11 indicates there is no significant relationship between scarring preference and Orientation. Because of the findings of no significance, the null hypothesis is accepted signifying that there is likely a functional relationship and preference for baskets with few knots.
4.5 Summary and Conclusions: Analytical Discussion and Study Implications

This thesis argues that CMTs, specifically cedar basket trees, are morphologically identifiable and the existing methodology for their study is capable of contributing to refined understanding of the archaeological record.

The main goal of this thesis was to offer an archaeological perspective for investigation of the cedar basket tree to contribute to the development of a method for inquiry and analysis, and uncover the potential for CMTs to provide an avenue for anthropological inference. These living artifacts offered a unique opportunity for investigation of cultural behavior and understanding of the cultural landscape. Two central research questions were presented: *How does the study of behavioral archaeology and the methodological approach presented in this thesis contribute to the understanding of indigenous culture? How does the investigation of cedar basket trees contribute to understandings of the cultural landscape?* Analytical discussion focuses on the hypotheses presented and the behavior and practices associated with cedar basket harvesting. Analytical implications are discussed within the context of the pilot field study, the proposed methodological perspective, and a landscape theoretical perspective. Supporting research
questions focus on what modifications took place, why they took place, and how they took place. Temporal investigation has determined when the modifications took place, and historical, ethnographic, and archaeological review has determined (who) the long standing presence of the Salish and Pend d’Orielle peoples in the region of the pilot field study.

Hypothesis 1 introduced a perspective model (Model A) for temporal and spatial investigation of cedar basket trees. Analysis for this model is based on limited temporal and spatial data; however, I suggest that a comprehensive field study with multiple cedar basket harvesting areas would be ideal for conclusive field results. This thesis presents a methodology and field study as a basis to demonstrate the possibilities of CMT investigation and comprehensive CMT studies. I suggested that cedar basket trees have temporal and spatial value and offered a perspective for investigating that value. Methods for Model A consisted of comprehensive background research for identification of cultural practices related to cedar basket harvesting, and uncovered ethnographic contexts related to harvesting practices. Based on these contexts and empirical observation in the field, I determined the basics for construction of cedar bark baskets. Subsistence practices related to basket harvesting were uncovered and attributed to berry harvesting, transport, and storage. Ethnographic research helped to identify some aspects of social organization related to harvesting. Bark harvesting for basket construction in the region of Western Montana had limited geographical range and harvesting and basket construction were tasks reserved mostly for women (White, 1954:5). Harvesting of berries was a family affair and rarely practiced outside of family bands (Teit and Boas, 1930:341-42). These contexts helped to determine the avenues for investigation of harvesting behavior, the development of research questions, and the development of hypotheses.

It is my contention that the temporal and spatial investigation of CMTs can reveal demographic and subsistence behaviors. Specifically, the use of historic, ethnographic, and other archaeological contexts can be correlated with archaeological data of CMTs to construct specific cultural chronologies within specific landscapes. Temporal data for this study revealed the possibilities for discovery of distinct scarring events based on dendrochronology. Morphological data was used to determine the frequency of scarring events related to basket size (Area). Analysis focused on the frequency of baskets harvested over time and the size of baskets harvested. This approach is meant to develop a time line of tribal utilization of CMT sites.
Harvesting practices are viewed as an indicator for group and individual behavior. It is assumed that there are factors that affect behavior, such as epidemics (population mortality), competition and conflict, assimilation (culture change, traditional practices, and spirituality) and environment (climate change and resource richness). These categories can be correlated with historic, ethnographic, archaeological chronologies, and local and regional environmental data to determine pertinent associations. Temporal and morphological data now can provide an avenue for the investigation of demographic change and subsistence behaviors.

Hypotheses 2, 3, and 4 focused on the morphological investigation (Model B) of harvesting behavior. Specific variables of Length, Width, Area, DBH, Orientation, and Age of Scar (AOS) were of specific interest. The hypotheses presented focused on specific relationships and attribute comparisons. The aim of the analysis was to demonstrate the possibilities of determining the variability of specific relationships between attributes. Research questions concentrated on what, why, and how cedar basket tree modifications took place. Historic and ethnographic contexts were used to determine bark basket construction, which also helped in developing specific research questions for each hypothesis and comparison. Data analysis confirmed a pattern of relationship between certain attributes with exception to orientation although the null hypothesis may provide a functional relationship. The comparison of Length and Width demonstrated a pattern where Length was generally longer than Width which would support the ethnographic background research for basket construction techniques (Teit and Boas, 1930:52-53). A pattern emerged that showed a decrease in Length and Width over time. The same pattern emerged for the comparison of tree diameter to Length and Width, although length is much more weakly correlated than width. The pattern suggested that tree diameter is somewhat correlated to Length and Width. Ethnographic background research indicated that smaller diameter cedar trees were preferred for the harvesting of bark for baskets (White, 1954:7). The preference for harvesting smaller diameter trees could be an indication of construction preferences, whereby bark that is thinner and less likely to have many knots is ideal for construction. Again, the hypotheses for Model B are presented to illustrate the possibilities for morphological investigation of CMTs. In-depth statistical analysis may determine the degree of confidence for these relationships; however that was not the goal for this thesis.
A behavioral approach to archaeological and systemic landscapes was utilized for a theoretical perspective. The archaeological landscape consists of the harvesting site and each CMT feature, while the systemic landscape consists of the local and regional populations of Salish and Pend d’Orielle peoples. The study of the cedar basket harvesting site and each CMT feature helps to make inferences about the behavior of those who utilized the site and what they were doing there. The spatial dimension helped to determine the absolute size of the study area or landscape (extent) which is the site and traditional territories of the Salish and Pend d’Orielle, and the absolute size of the smallest unit (grain) which are the attributes recorded within the field site. The temporal dimension helped to delineate the absolute time (span) and smallest time (interval) for analysis. The span of time depends on the scope of research and what goals they wish to accomplish. In this case, harvesting events can be determined to the year, but once the growth occurs for the year for the tree, finer temporal distinctions are not possible. The span for my field study is the oldest date of harvesting although historical and archaeological span extend to the beginning of the historic period. The interval dimension for my study is the calendar year. The behavioral dimension aided in determining the scales of interaction, activities, and behavioral systems. Interactions are related to the smallest scale of behavior, such as the communication between people: seeing, hearing, and talking. Activities pertain to larger scales of finite interactions such as the activities conducted at a harvesting site, berry harvesting, and group tasks. The behavioral system consists of the networks and activities and scales of human behavior of those on the landscape. This behavioral system provided perspective and directly relates to the research questions for the investigation of cedar basket trees and their contribution to understandings of the cultural landscape.

The basic tenets of landscape theory are utilized to help interpret and describe indigenous behavior. Landscapes are described as being interactive and having meaning; they are temporal and spatially related to those who live in them; they help to frame the inhabitants and understand the meaning they project on landscapes and effects landscapes have on culture; landscapes are culturally constructed. These tenets are considered in the interpretation of bark harvesting and associated behaviors, and within the behavioral approach outlined above. The practice of cedar basket making, harvesting, and the harvesting site is framed in terms of these central tenets. Specifically these tenets help to understand the process of harvesting, any meanings associated with harvesting, and how meaning might translate into harvesting practices. Secondary research
questions asked about what, why, and how cedar basket tree modifications took place? Through morphological investigation I have identified the probable source and type of modification taking place as cedar bark harvesting for cylindrical baskets. Ethnographic inquiry was valuable in determining the probable uses of this type of basket as for berry collection and storage. However, because of the contemporary use in the four previous decades of the study site, the harvesting site in actuality may represent a revival of traditional technologies related or linked to social factors. Regardless, the site documents important continuities in traditional construction of the landscape, and will provide a comparison for future studies of earlier sites. Ethnographic and empirical analysis helped to determine how modifications took place. Cut marks and bark peels are characteristic of the classic cylindrical basket which is represented in the morphological typology and typical construction of them. These characteristics inform us of how this type of basket was made. The method of construction and functionality of cedar bark baskets implies that the makers are knowledgeable in many aspects that might affect preferences of length and width, the diameter of a potential tree for harvesting, and orientation. Intimate ecological knowledge may also transcend into the holistic views of harvesting practices. This is evident in the fact that no dead CMT within the harvesting site were observed. My archaeological methods for dating also took a non-destructive approach for coring samples. The landscape theoretical approach which observes the holistic nature of landscapes and people that occupy them was utilized because its parallels and compliments indigenous perspectives of the landscape.

The goals of this thesis were to offer an archaeological perspective and introduce and contribute to a methodological approach for investigating CMTs. I subscribe to the idea of CMTs, as being living archives, should be considered an indicator of general human behavior as well as a record of specific indigenous people’s use of forests. CMT sites allow for archaeological inferences to be made and for deeper understandings of indigenous cultures. Through the development of primary research questions, hypotheses, and analysis of the pilot field study we now have a better understanding of the harvesting site and those that utilized it. Although individual harvesting sites are valuable for archaeological investigation, we can now consider further investigation and the possibilities of site comparisons through regional landscape studies.
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Appendix A: Attributes, Data Tables, and Histograms

Cedar Bark Basket Scar Attributes of Diameter at Breast Height, Slope, Length, Width, Thickness, Height above Ground, Side (Orientation), Age of Scar, and Area.

<table>
<thead>
<tr>
<th>Feature</th>
<th>DBH</th>
<th>SLP</th>
<th>LEN</th>
<th>WID</th>
<th>THK</th>
<th>HAG</th>
<th>SDE</th>
<th>AOS</th>
<th>Area</th>
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</thead>
<tbody>
<tr>
<td>080211-01</td>
<td>38</td>
<td>0</td>
<td>103</td>
<td>67</td>
<td>3.8</td>
<td>70</td>
<td>184</td>
<td>1974</td>
<td>3450.5</td>
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<tr>
<td>080211-02</td>
<td>36</td>
<td>60%</td>
<td>53</td>
<td>28</td>
<td>6.3</td>
<td>66</td>
<td>328</td>
<td>1979</td>
<td>742</td>
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<tr>
<td>080211-03</td>
<td>18</td>
<td>0%</td>
<td>84</td>
<td>25</td>
<td>3.2</td>
<td>69</td>
<td>308</td>
<td>1990</td>
<td>1050</td>
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<tr>
<td>080211-04</td>
<td>38</td>
<td>5%</td>
<td>48</td>
<td>25</td>
<td>4.4</td>
<td>91</td>
<td>10</td>
<td>1982</td>
<td>600</td>
</tr>
<tr>
<td>080211-05</td>
<td>21</td>
<td>0%</td>
<td>53</td>
<td>53</td>
<td>3.8</td>
<td>64</td>
<td>282</td>
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<td>1404.5</td>
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<td>0%</td>
<td>69</td>
<td>76</td>
<td>7.6</td>
<td>94</td>
<td>10</td>
<td>1962</td>
<td>2622</td>
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<tr>
<td>080211-07*</td>
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<td>99</td>
<td>79</td>
<td>8.8</td>
<td>94</td>
<td>232</td>
<td>1965</td>
<td>3910.5</td>
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<tr>
<td>080211-08A</td>
<td>20</td>
<td>0%</td>
<td>25</td>
<td>20</td>
<td>3.1</td>
<td>135</td>
<td>320</td>
<td>1993</td>
<td>250</td>
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<td>0%</td>
<td>43</td>
<td>33</td>
<td>3.1</td>
<td>76</td>
<td>356</td>
<td>1993</td>
<td>709.5</td>
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<tr>
<td>080211-09</td>
<td>30</td>
<td>0%</td>
<td>64</td>
<td>33</td>
<td>4.4</td>
<td>86</td>
<td>320</td>
<td>1993</td>
<td>1056</td>
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<td>080211-10</td>
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<td>0%</td>
<td>84</td>
<td>33</td>
<td>3.8</td>
<td>88</td>
<td>226</td>
<td>1992</td>
<td>1386</td>
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<tr>
<td>080411-11</td>
<td>47</td>
<td>15%</td>
<td>58</td>
<td>58</td>
<td>5.1</td>
<td>81</td>
<td>278</td>
<td>1966</td>
<td>1682</td>
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<td>180</td>
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<td>2193</td>
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<td>080414-14*</td>
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<td>0%</td>
<td>79</td>
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<td>84</td>
<td>204</td>
<td>1978</td>
<td>2409.5</td>
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<td>080411-15</td>
<td>27</td>
<td>5%</td>
<td>46</td>
<td>38</td>
<td>5.7</td>
<td>117</td>
<td>142</td>
<td>1984</td>
<td>874</td>
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<td>080411-16</td>
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<td>46</td>
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<td>080411-17</td>
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<td>298</td>
<td>1990</td>
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<td>41</td>
<td>5.7</td>
<td>64</td>
<td>8</td>
<td>1991</td>
<td>1250.5</td>
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<tr>
<td>Feature</td>
<td>DBH</td>
<td>SLP</td>
<td>LEN</td>
<td>WID</td>
<td>THK</td>
<td>HAG</td>
<td>SDE</td>
<td>AOS</td>
<td>Area</td>
</tr>
<tr>
<td>------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Mean</td>
<td>95.09</td>
<td>7.2059%</td>
<td>63.62</td>
<td>40.62</td>
<td>5.279412</td>
<td>88.38</td>
<td>207.71</td>
<td>1981.74</td>
<td>1372.309</td>
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<tr>
<td>Median</td>
<td>93.00</td>
<td>5.0000%</td>
<td>59.50</td>
<td>38.00</td>
<td>5.100000</td>
<td>87.00</td>
<td>229.00</td>
<td>1982.00</td>
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Cedar Attribute Statistics
<table>
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<tr>
<th>Mode</th>
<th>86$^a$</th>
<th>5.00%</th>
<th>53$^a$</th>
<th>33</th>
<th>5.100$^a$</th>
<th>76$^a$</th>
<th>10$^a$</th>
<th>1978$^a$</th>
<th>250.0$^a$</th>
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</thead>
<tbody>
<tr>
<td>Std.</td>
<td>27.919</td>
<td>11.88271</td>
<td>24.918</td>
<td>15.088</td>
<td>1.569168</td>
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<td>Variance</td>
<td>779.47</td>
<td>141.199</td>
<td>620.91</td>
<td>227.63</td>
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<td>458.54</td>
<td>13996.39</td>
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<td>807484.31</td>
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</tbody>
</table>

a. Multiple modes exist. The smallest value is shown

![DBH Histogram](image)

Mean = 95.09
Std. Dev. = 27.919
N = 34
Appendix B: Cedar Basket Recording Sheets and Photographs

Cedar Basket Tree Recording Sheet

Feature #: 080211-01
DBH: 37.89
SLP: 0%
LEN: 103
WID: 67
THK: 3.8
HAG: 70
SDE: 184
TMK: yes
AOS: 1974

Location Description: 10 ft. west of Mission Creek and upper campground, at base of falls

Condition: live, modern graffiti

Core Sample: yes

Photo Log: 1-3
<table>
<thead>
<tr>
<th>Feature #</th>
<th>080211-2</th>
</tr>
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<tbody>
<tr>
<td>DBH</td>
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<tr>
<td>LEN</td>
<td>53</td>
</tr>
<tr>
<td>WID</td>
<td>28</td>
</tr>
<tr>
<td>THK</td>
<td>6.3</td>
</tr>
<tr>
<td>HAG</td>
<td>66</td>
</tr>
<tr>
<td>SDE</td>
<td>328</td>
</tr>
<tr>
<td>TMK</td>
<td>yes</td>
</tr>
<tr>
<td>AOS</td>
<td>1979</td>
</tr>
</tbody>
</table>

**Location Description:** 40 ft. southwest of the trailhead sign next to the Falls

**Condition:** live

**Core Sample:** yes

**Photo Log:** 4-6
Cedar Basket Tree Recording Sheet

**Feature #:** 080211-03

**DBH:** 17.83

**SLP:** 0%

**LEN:** 84

**WID:** 25

**THK:** 3.2

**HAG:** 69

**SDE:** 308

**TMK:** yes

**AOS:** 1990

**Location Description:** near upper parking area 60 ft. north of the road

**Condition:** live

**Core Sample:** yes

**Photo Log:** 7-9
Cedar Basket Tree Recording Sheet

Feature #: 080211-04
DBH: 37.89
SLP: 5%
LEN: 48
WID: 25
THK: 4.4
HAG: 91
SDE: 10
TMK: yes
AOS: 1982

Location Description: middle of parking lot, 50 ft. north of the road
Condition: live
Core Sample: yes
Photo Log: 10-12
Cedar Basket Tree Recording Sheet

Feature #: 080211-05

DBH: 21.01

SLP: 0%

LEN: 53

WID: 53

THK: 3.8

HAG: 64

SDE: 282

TMK: yes

AOS: 1983

Location Description: 100 ft. north of road and middle of the campground

Condition: live

Core Sample: yes

Photo Log: 13-15
Cedar Basket Tree Recording Sheet

Feature #: 080211-06

DBH: 48.40

SLP: 0%

LEN: 69

WID: 76

THK: 7.6

HAG: 94

SDE: 10

TMK: yes

AOS: 1962

Location Description: 40 ft. north of campground and bottom 1/3 of campground

Condition: live

Core Sample: yes

Photo Log: 16-18
Cedar Basket Tree Recording Sheet

Feature #: 080211-07*

DBH: 45.22

SLP: 5%

LEN: 99

WID: 79

THK: 8.8

HAG: 94

SDE: 232

TMK: yes

AOS: 1965

Location Description: bottom 1/3 of campground 30 ft. north of the road

Condition: live

Core Sample: yes

Photo Log: 19-21
Photo #19
Cedar Basket Tree Recording Sheet

Feature #: 080211-08A
DBH: 20.06
SLP: 0%
LEN: 25
WID: 20
THK: 3.1
HAG: 135
SDE: 320
TMK: yes
AOS: 1993

Location Description: 100 ft. west of campground 45 ft. south of road

Condition: live

Core Sample: yes for both

Photo Log: 8A 22-24
Cedar Basket Tree Recording Sheet

Feature #: 080211-08B

DBH: 20.06

SLP: 0%

LEN: 43

WID: 33

THK: 3.1

HAG: 76

SDE: 356

TMK: yes

AOS: 1993

Location Description: 100 ft. west of campground 45 ft. south of road

Condition: live

Core Sample: yes

Photo Log: 25-27

Photo #28
Cedar Basket Tree Recording Sheet

**Feature #:** 080211-09

**DBH:** 29.93

**SLP:** 0%

**LEN:** 64

**WID:** 33

**THK:** 4.4

**HAG:** 86

**SDE:** 320

**TMK:** yes

**AOS:** 1993

**Location Description:** 100 ft. west of campground 45 ft. south of road

**Condition:** live

**Core Sample:** yes

**Photo Log:** 28-30
Cedar Basket Tree Recording Sheet

**Feature #:** 080211-10

**DBH:** 45.22

**SLP:** 0%

**LEN:** 84

**WID:** 33

**THK:** 3.8

**HAG:** 88

**SDE:** 226

**TMK:** yes

**AOS:** 1992

**Location Description:** 90 ft. west of upper campground 50 ft. south of road

**Condition:** live

**Core Sample:** yes

**Photo Log:** 31-33
Cedar Basket Tree Recording Sheet

Feature #: 080411-11

DBH: 46.81

SLP: 15%

LEN: 58

WID: 58

THK: 5.1

HAG: 81

SDE: 278

TMK: yes

AOS: 1966

Location Description: 90 ft. west of upper campground 50 ft. south of road

Condition: live

Core Sample: yes

Photo Log: 34-36
Cedar Basket Tree Recording Sheet

Feature #: 080411-12

DBH: 21.33

SLP: 15%

LEN: 86

WID: 25

THK: 2.5

HAG: 109

SDE: 52

TMK: yes

AOS: 1993

Location Description: 90 ft. west of upper campground 50 ft. south of road

Condition: live

Core Sample: yes

Photo Log: 37-39
Cedar Basket Tree Recording Sheet

Feature #: 080411-13

DBH: 35.66

SLP: 0%

LEN: 86

WID: 51

THK: 4.4

HAG: 79

SDE: 180

TMK:

AOS: 1987

Location Description: 80 ft. west of upper campground 30 ft. south of road

Condition: live, right side of basket scar is damaged by a fallen fir tree

Core Sample: yes

Photo Log: 40-42
Cedar Basket Tree Recording Sheet

Feature #: 080411-14*

DBH: 34.71

SLP: 0%

LEN: 79

WID: 61

THK: 5.1

HAG: 84

SDE: 204

TMK: yes

AOS: 1978

Location Description: 70 ft. west of campground 25 ft. north of Mission Creek

Condition: live

Core Sample: yes

Photo Log: 43-45
Cedar Basket Tree Recording Sheet

Feature #: 080411-15

DBH: 27.38

SLP: 5%

LEN: 46

WID: 38

THK: 5.7

HAG: 117

SDE: 142

TMK: yes

AOS: 1984

Location Description: 110 ft. west of upper campground 70 ft. south of road

Condition: live

Core Sample: yes

Photo Log: 46-48
Cedar Basket Tree Recording Sheet

Feature #: 080411-16

DBH: 24.20

SLP: 5%

LEN: 28

WID: 30

THK: 4.4

HAG: 117

SDE: 46

TMK: yes

AOS: 1976

Location Description: 115 ft. west of upper campground 65 ft. south of road

Condition: live

Core Sample: yes

Photo Log: 49-51
Cedar Basket Tree Recording Sheet

Feature #: 080411-17
DBH: 34.71
SLP: 5%
LEN: 53
WID: 20
THK: 3.8
HAG: 76
SDE: 298
TMK: yes
AOS: 1990

Location Description: 110 ft. west of campground 75 ft. south of the road
Condition: live
Core Sample: yes
Photo Log: 52-54
<table>
<thead>
<tr>
<th>Feature #:</th>
<th>080411-18</th>
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<tbody>
<tr>
<td>DBH:</td>
<td>28.98</td>
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<tr>
<td>SLP:</td>
<td>5%</td>
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<td>LEN:</td>
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<td>WID:</td>
<td>41</td>
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<td>THK:</td>
<td>5.7</td>
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<td>HAG:</td>
<td>64</td>
</tr>
<tr>
<td>SDE:</td>
<td>8</td>
</tr>
<tr>
<td>TMK:</td>
<td>yes</td>
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<tr>
<td>AOS:</td>
<td>1991</td>
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<tr>
<td>Location Description:</td>
<td>160 ft. west of upper campground 60 ft. south of the road</td>
</tr>
<tr>
<td>Condition:</td>
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<tr>
<td>Core Sample:</td>
<td>yes</td>
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<tr>
<td>Photo Log:</td>
<td>55-57</td>
</tr>
</tbody>
</table>
Cedar Basket Tree Recording Sheet

Feature #: 080411-19

DBH: 29.29

SLP: 0%

LEN: 61

WID: 43

THK: 5.1

HAG: 91

SDE: 268

TMK: yes

AOS: 1998

Location Description: 160 ft. west of campground 70 ft. south of the road

Condition: live

Core Sample: yes

Photo Log: 58-60
Cedar Basket Tree Recording Sheet

**Feature #:** 080411-20

**DBH:** 29.93

**SLP:** 0%

**LEN:** 48

**WID:** 41

**THK:** 5.1

**HAG:** 122

**SDE:** 352

**TMK:** yes

**AOS:** 1998

**Location Description:** 175 ft. west of campground 90 ft. south of road

**Condition:** live

**Core Sample:** yes

**Photo Log:** 61-63
Cedar Basket Tree Recording Sheet

Feature #: 082511-21
DBH: 28.34
SLP: 5%
LEN: 75
WID: 33
THK: 5.1
HAG: 51
SDE: 270
TMK: yes
AOS: 1977

Location Description: 80 ft. south of the road 200 ft. west of upper campground on ledge 60 ft. east of creek

Condition: live

Core Sample: yes

Photo Log: 64-66
Cedar Basket Tree Recording Sheet

Feature #: 082511-22*

DBH: 18.15

SLP: 5%

LEN: 101

WID: 39

THK: 6.3

HAG: 76

SDE: 354

TMK: yes

AOS: 1997

Location Description: 50 ft. north of road 180 ft. west of campground

Condition: live, young tree barely 30 ft.

Core Sample: yes: R

Photo Log: 67-69
Cedar Basket Tree Recording Sheet

Feature #: 082511-23

DBH: 27.38

SLP: 5%

LEN: 61

WID: 46

THK: 7.6

HAG: 79

SDE: 32

TMK: yes

AOS:

Location Description: 25 ft. south of road 175 ft. west of campground

Condition: live

Core Sample: yes: R

Photo Log: 70-72
Cedar Basket Tree Recording Sheet

Feature #: 082511-24

DBH: 23.56

SLP: 5%

LEN: 46

WID: 28

THK: 5.7

HAG: 109

SDE: 162

TMK: yes

AOS: 1978

Location Description: 15 ft. south of road 180 ft. west of campground

Condition: live

Core Sample: yes: core went to pith of the tree: L

Photo Log: 73-75
Cedar Basket Tree Recording Sheet

**Feature #:** 082511-25

**DBH:** 35.03

**SLP:** 5%

**LEN:** 58

**WID:** 57

**THK:** 8.2

**HAG:** 94

**SDE:** 6

**TMK:** yes

**AOS:** 1976

**Location Description:** 20 ft. south of road 170 ft. west of campground

**Condition:** live

**Core Sample:** yes: core went to pith of tree: R

**Photo Log:** 76-78
Cedar Basket Tree Recording Sheet

Feature #: 082511-26

DBH: 22.61

SLP: 5%

LEN: 33

WID: 33

THK: 5.7

HAG: 117

SDE: 162

TMK: yes

AOS: 1978

Location Description: 10 ft. south of road 195 ft. west of campground

Condition: live

Core Sample: yes: R

Photo Log: 79-81
Cedar Basket Tree Recording Sheet

Feature #: 080211-27
DBH: 30.89
SLP: 5%
LEN: 30
WID: 34
THK: 7.6
HAG: 112
SDE: 348
TMK: yes
AOS: 1972

Location Description: 5 ft. from road 155 ft. west of campground

Condition: live

Core Sample: yes: R

Photo Log: 82-84
Cedar Basket Tree Recording Sheet

Feature #: 082511-28
DBH: 35.66
SLP: 5%
LEN: 47
WID: 38
THK: 5.7
HAG: 109
SDE: 178
TMK: yes
AOS: 1984

Location Description: 2 ft. off of road 4 ft. west of feature 082511-27
Condition: live
Core Sample: yes: R
Photo Log: 85-87
Cedar Basket Tree Recording Sheet

Feature #: 082511-29

DBH: 31.21

SLP: 5%

LEN: 85

WID: 46

THK: 6.9

HAG: 84

SDE: 134

TMK: yes

AOS: 1973

Location Description: 45 ft. south of road 150 meters west of campground, bulldozer wide-out on road just above it

Condition: live

Core Sample: yes: R

Photo Log: 88-90
Cedar Basket Tree Recording Sheet

**Feature #:** 082511-30

**DBH:** 28.34

**SLP:** 10%

**LEN:** 103

**WID:** 33

**THK:** 5.1

**HAG:** 97

**SDE:** 344

**TMK:** yes

**AOS:** 1963

**Location Description:** 170 meters west of the campground 50 ft. south of road on bench above creek- creek is 30 ft. below bench

**Condition:** live

**Core Sample:** yes: L

**Photo Log:** 91-93
Cedar Basket Tree Recording Sheet

**Feature #:** 082511-31

**DBH:** 16.24

**SLP:** 30%

**LEN:** 34

**WID:** 25

**THK:** 3.8

**HAG:** 66

**SDE:** 244

**TMK:** yes

**AOS:** 1982

**Location Description:** 40 ft. north of creek, mid-slope off of bench

**Condition:** live

**Core Sample:** yes: L

**Photo Log:** 94-96
Cedar Basket Tree Recording Sheet

Feature #: 082511-32*
DBH: 27.38
SLP: 30%
LEN: 122
WID: 51
THK: 5.7
HAG: 41
SDE: 324
TMK: yes
AOS: 1969

Location Description: 20 ft. north of creek 160 meters west of campground on bottom of slope below bench

Condition: live

Core Sample: yes: R

Photo Log: 97-99
Cedar Basket Tree Recording Sheet

Feature #: 082511-33
DBH: 38.85
SLP: 10%
LEN: 37
WID: 38
THK: 6.9
HAG: 97
SDE: 100
TMK: yes
AOS: 1978

Location Description: 55 ft. north of creek just on edge of bench
Condition: live
Core Sample: yes: R
Photo Log: 100-102