UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

IDENTIFYING SOCIALIZED LANDSCAPES
IN THE BRIDGER MOUNTAINS, MONTANA

A THESIS

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

MASTER OF ARTS

By

MEGHAN J. DUDLEY
Norman, Oklahoma
2017

IDENTIFYING SOCIALIZED LANDSCAPES
IN THE BRIDGER MOUNTAINS, MONTANA

A THESIS APPROVED FOR THE
DEPARTMENT OF ANTHROPOLOGY

BY

Dr. Bonnie L. Pitblado, Chair

Dr. Asa R. Randall

Dr. Patrick Livingood

To my parents,

Cum amore omnia somnia teneo cum auxilio.

Acknowledgements

My research simply would not have been possible with a number of people supporting me throughout the thesis process. First and foremost, I want to thank Jack Fisher of Montana State University and Bob Donahoe for introducing me to the archaeology of the Bridger Mountains when I was an undergraduate and continuing to support my interest into this project. It is because of their hard work and dedication to the archaeology of the Bridger Mountains that I could conduct my analyses. Whether that support came in allowing me to use databases they compiled or taking me on hikes throughout the mountains to visit sites, I cannot thank them enough for everything they have done.

I also want to thank my thesis committee for their patience and support through this process. Bonnie Pitblado, who has always encouraged my ideas, offered key insights about Rocky Mountain archaeology in general as well as how to capture my ideas both in writing and in presentations. Without those skills and knowledge as well as funding support, I would be lost. Asa Randall also provided invaluable input on and suggestions of the study of socialized landscapes, the foundation of my research. Without Patrick Livingood's guidance, I could not have tackled the archaeological statistics or ArcGIS analyses incorporated here. I also wish to thank William Ankele for the countless hours spent providing editing feedback and ArcGIS support when troubles arose.

Financially, I could not have conducted my research without grants from the Charles Redd Center of Brigham Young University and the Graduate Student Senate at the University of Oklahoma. Their contributions are greatly appreciated.

Table of Contents

List of Tables

List of Figures

Abstract

Archaeologists, working in the Rocky Mountains and throughout the world, have long recognized that people, regardless of time and space, invest social meanings into the landscape around them. Based on de Certeau's (1984) "Spatial Stories," these "socialized landscapes" consist of two archaeologically identifiable components: *espaces* (or practiced spaces) and *tours* (or practiced paths). I operationalize these ideas by creating archaeological expectations for six socialized landscape types, inspired by Scheiber's (2015) mountain landscape tropes: resource, symbolic, wilderness, refuge, recreational, and composite. In doing so, I ask what types of socialized landscapes we can identify from a largely lithic archaeological record in the Rocky Mountains. I test my expectations with a pilot study in the Bridger Mountains of southwestern Montana. By controlling for time period using projectile point types found at sites throughout the mountains, I conduct a series of four analyses by time period to determine what types of *espaces* and *tours* people there created in the past. I then compare those results against my archaeological expectations. My results indicate that people in the Paleoindian Period created a resource socialized landscape, whereas groups from the Early Archaic through to the Late Pre-Contact Periods created composite socialized landscapes of resources and symbolic place-markers. Although this pilot study reveals areas of the methodology and analyses that can be improved in future studies, my study suggests that we can use this approach to study past socialized landscapes created by hunter-gatherers both in the Rocky Mountains and throughout the world, even when we lack oral traditions to better understand these spaces.

Chapter 1: Introduction

Figure 1.1. The Bridger Mountains looking northeast from Bozeman, Montana on April 2, 2015.

When you live in Bozeman, Montana, as I did, it is hard to overlook the sight of the Bridger Mountains (Figure 1.1). The mountains are an unassuming range framing the eastern edge of town that lack the dramatic slopes and staggering elevations of the neighboring Gallatin, Madison, and Tobacco Root ranges. However, they have always been a comforting sight to me. While living in Bozeman for five years, the mountains were a refuge and an escape from a sedentary life in the valley, beckoning me to get away from town. By seeing the same peaks and slopes from the same angle every day, I incorporated and socialized them into my world as a refuge from daily stress. Now that I live in Oklahoma, I still appreciate seeing those mountains, but now they symbolize why I moved to such a different place to study at the University of Oklahoma: to try and understand what these average, ordinary little mountains meant to other people who lived here in the past.

Laura Scheiber (2015) wrote that people in the past and present socialize their mountain landscapes in one of four ways: as a place of resources to be used; as a symbol, holding sacred and (or) place-marker information; as a wilderness area to be avoided; and as a refuge in time of stress. The way people, including me, associate these views and other culturally based perceptions with the mountains and socialize these places is determined primarily by how they act when they are there and the culture in which they live.

Mountains are not, of course, the only landscapes that people socialize. Regardless of time and culture, people have always socialized their landscapes by investing cultural meanings into places through their actions (de Certeau 1984; Ingold 1993). Such landscapes consist of significant spaces and socially meaningful paths. Archaeologists have successfully explored past socialized landscapes throughout the world (e.g., Basso 1996; Bradley 2000; Jordan 2003; Snead 2009). For example, those working in the American Southwest have identified significant landscape features based on the placement of stone architecture or site furniture (e.g. Joyce 2009; Snead 2008). Similarly, scholars in the American Southeast and Great Britain have identified and explored the meanings behind significant spaces on the landscape that bring people together for a variety of reasons (e.g., Randall 2015; Tilley 2010).

In contrast to other regions, the past socialized landscapes of the Rocky Mountains have received relatively little archaeological attention, for two main reasons. First, compared to adjacent regions like the Great Plains, the archaeological record of the Rocky Mountains has not been intensively studied until the last few decades. Whereas archaeologists in the Southwest and the Great Plains began research early in the twentieth century (e.g., Holmes 1914; Nelson 1916), the earliest studies in the Rockies did not begin until the mid-twentieth century (e.g., Hurst 1943; Wormington and Forbis 1965) and did not proceed in earnest until the 1970s (e.g. Benedict 1974; Davis et al. 1988; Knudson 1973). As a result, the initial theoretical approaches invoked to understand how people used mountain landscapes have tended by necessity to be culture-historical and (or) processual in nature. However, Rocky Mountain archaeology has reached the point that we can begin to address issues not only of subsistence strategies and mobility, but also of agency and ideology, including socialized landscapes.

The second reason Rocky Mountain socialized landscapes have been understudied is because the region consists largely of lithic tools and the debris of their production left behind by hunter-gatherers. Because traditional studies of past socialized landscapes have used architectural features and (or) oral histories to identify and interpret them, few Rocky Mountains archaeologists have had the means to discuss them. For the Late Pre-Contact Period (1,500 to 200 B.P.), a few scholars have begun to research such landscapes using oral histories and the direct historic approach (e.g. Oetelaar and Oetelaar 2011; Scheiber and Finley 2011; Zedeño 2015). In contrast, those working in the deeper time periods of the Paleoindian (13,000 to 8,600 BP) and Archaic (8,600 to 1,360 BP) have relied on universal concepts of how people interact with mountains to discuss these temporally remote socialized landscapes (e.g., Gillespie 2007; Pitblado 2017). However, because the theory and the data have both now been more richly developed, Rocky Mountain archaeologists are primed to begin asking questions about past socialized landscapes regardless of time period. In my case, I hope to learn what types of socialized landscapes people created in the mountains.

Answering this question requires developing a methodology tailored to address it. Data from large-scale architectural features and oral histories are, as noted above, generally unavailable to Rocky Mountain archaeologists working in deep time. Instead, researchers must identify alternative features we can see. Based on archaeological and ethnographic examples, I use Scheiber's (2015) four mountain landscape tropes to frame my investigation within de Certeau's (1984) theory of the *espace* (a practiced space) and *tour* (a practiced path). I argue that each landscape type that Scheiber (2015) described will have a unique signature in the archaeological record from the *espaces* people created. I develop archaeological expectations for each and test them using a case study based in the Bridger Mountains, Montana.

The Bridger Mountains in southwestern Montana offer an appropriate laboratory to evaluate archaeological expectations adapted from Scheiber's (2015) tropes. A small front range in the northern Rocky Mountains, the Bridger Mountains have served for millennia not only as a travel corridor between two valleys, the Gallatin and the Shields River Valleys, but they also contain a wealth of resources and unique landscape features that have drawn people to them in the present and past. Although archaeologists knew about sites in the Bridger Mountains by the mid-20th century (e.g., Napton 1966; Niven 1959), professional archaeologists, notably Jack Fisher of Montana State University and Walter Allen of the Gallatin National Forest, first systematically surveyed the area in the 1990s and 2000s. Their efforts resulted in the only publication to focus on the mountains to date, describing the landscape as, first and foremost, a resource patch for hunter-gatherers (Byers et al. 2003).

Over the course of nearly two decades of fieldwork, Fisher's team recovered 176 projectile points of varying ages from surface contexts at 28 sites in the Bridger Mountains. For my research, I use the projectile points to identify sites by time period, and then use those sites and associated data (e.g., locational information and site characteristics), to evaluate my expectations. Ultimately, I aim to determine what types of socialized landscapes in the Bridger Mountains can be identified using an archaeological record composed exclusively of lithic artifacts.

My results show that we can, in fact, identify past social landscapes in the Bridger Mountains by assessing the archaeological record against my developed expectations. Although each time period reflects slightly different patterns of landscape types, I identify a resource-socialized landscape in the Paleoindian Period and composite landscapes made of resource and symbolic landscape types in the Archaic and Late Pre-Contact Periods. By showing that we can identify socialized landscapes in the Bridger Mountains, previously described as a resource patch (Byers et al. 2003), I demonstrate that it is possible to "see" such landscapes and interpret them in more nuanced ways than previously done, using lithic scatters and projectile points. Despite the successes of this first step, there is room for improvement in further studies. For example, a middle range theory or analogy might aid in the interpretation of mountain landscape types and facilitate identifying subtypes within each category. In addition, using projectile point typologies as the only dating technique for surface sites results in large date ranges, making it difficult to determine the contemporaneity of sites in the mountains. Regardless of improvements that can be made in the future, this study contributes to our understanding of socialized landscapes by identifying and interpreting the type of landscapes present in the Bridger Mountains and, more generally, the Rocky Mountains, during the past 13,000 years.

I begin by presenting my study in Chapter 2 with a summary of landscape archaeological theories and the current status of such research in the Rocky Mountains. I continue the theoretical discussion in Chapter 3 by outlining the methodology I develop to answer my research questions. I then provide background information on the pilot study area, the Bridger Mountains, in Chapter 4. In Chapter 5 and 6, I describe the methods and analyses I use to identify socialized landscapes as well as the results of those analyses. Finally, in Chapter 7, I discuss the implications of my results for our understanding of the hunter-gatherers who lived Bridger Mountains and throughout Rocky Mountains in general.

Chapter 2: Theories of Landscape Archaeology

To determine what types of socialized landscapes we can identify in the Rocky Mountains, we must first understand the theoretical trajectory of landscape archaeology and, more specifically, the study of socialized landscapes. Here, I review the history of landscape studies in archaeology and then discuss how Rocky Mountain archaeologists have approached studying socialized landscapes. This exercise shows that, although archaeologists do not always use unique or consistent terms to describe their interpretations, they have long recognized the presence of socialized landscapes in the Rocky Mountains.

History of Landscape Archaeology

"Landscape archaeology" has, minimally, three distinct conceptual definitions in archaeological research. First, "landscape archaeology" can simply refer to the large geographic scale of a study area (e.g., a site vs. a number of sites within a defined regional context) (David and Thomas 2008). Second, "landscape archaeology" can refer to investigating the archaeology of a landscape itself by treating the landscape as the focus of research, rather than as a setting or context for site-based studies (Aston and Rowley 1974; David and Thomas 2008). Finally, "landscape archaeology" also describes approaches that view the landscape as the intersection between people and their physical environment (Crumley and Marquardt 1990). However, because landscape archaeology is first and foremost a scalar approach to the archaeological record, it has a long history in the discipline and has been shaped by the prevailing archaeological paradigm at any given time.

Culture-History and Landscape Archaeology

Archaeologists first considered a larger spatial scale than individual sites of the archaeological record, using the culture-historical paradigm by building regional culture-histories that consisted of chronologies and material characteristics of a particular archaeological culture (Johnson 2010; Trigger 2006). Chronologies and culture-trait lists were often developed from single, significant archaeological sites that were well stratified and carefully excavated. For example, Nelson (1916) published a landmark study in which he developed a seriated ceramic chronology from large-scale excavations in Tano Ruins. Although Nelson (1916) focused on defining types of ceramics from Tano Ruins, he tested the resulting chronology at other sites in the region. Other examples of such studies include chronologies developed from projectile point typologies for the Rocky Mountains and Great Plains (Wormington 1939, 1948; Wormington and Forbis 1965). Although the landscapes as a whole were not the primary focus at this time in archaeological history, the chronologies that culture historians developed based on artifact types were applied over broad spatial scales to make sense of the culture history of Pre-Contact groups. In effect, then, culture-history typological chronologies provide us with the earliest example of landscape archaeology.

Processualism and Landscape Archaeology

Processual archaeology of the 1960s and 1970s ushered in a new approach to large spatial scales in archaeology, as archaeologists began to examine how cultures served as human adaptions to their environments that changed over time (Ashmore 2002; Johnson 2010; Trigger 2006). Scholars compared multiple sites across large areas to identify intersite behavioral patterns of subsistence and resource procurement strategies. A well known example of this practice is Lewis Binford's (1980) forager and collector spectrum. The spectrum correlates hunter-gatherer subsistence strategies with the types of environments they lived in and the availability of resources. On one end of the spectrum, foragers occupy landscapes where resources are abundant, gathering those resources within a day's travel of their residential camp and exhausting them before moving camp (Binford 1980). Collectors, on the other end of the spectrum, occupy landscapes where resources are restricted on a seasonal or other basis. As a result, they establish a main residential camp and multiple specialized sites away from the main camp to acquire particular resources when they become available (Binford 1980). Whereas previously culture-historic archaeologists focused largely on single sites, Binford explored intersite variability to interpret subsistence strategies at a grander geographic scale than previously explored.

Other processual approaches also incorporate a landscape-scale consideration of the archaeological record. For instance, optimal foraging theory holds that humans will gather resources from their environment in the most efficient manner possible (Smith 1983). Authors such as Hawkes and colleagues (1982) and Smith (1983), among many others, have argued that hunter-gatherers must know their landscapes and resources well because they gather their resources in the most efficient way possible. Whether one used Binford's model, optimal foraging theory, or any other processual approach, the landscape in each case shifted from being a peripheral concern, as it was during the culture-historical era, to being essential to understanding larger-scale land use patterns over time.

Post-Processualism and Landscape Archaeology

Beginning in the 1980s and 1990s, some archaeologists responded to what they saw as an over-emphasis on materialist concerns and focused instead on social and symbolic elements of cultures (Ashmore 2002; Trigger 2006; Johnson 2010). At a landscape level, these interests manifested largely as investigations into social meanings associated with particular landscape features and locations. Such studies, beginning with the post-processual movement in the 1980s and 1990s and continuing under the loosely defined label “landscape archaeology,” take a variety of approaches that largely fall into one of two categories: contrasting notions of “space” and “place,” and landscape phenomenology.

Space and Place. Of the two primary approaches to post-processual landscape archaeology, the notion of space and place incorporates the greatest diversity of methods and ideas. Most scholars consider “space” to encompass the natural world, to which people have not contributed any cultural associations (Anschuetz et al. 2001). In contrast, a “place” is a location in the natural world in which people have invested cultural meanings and significance (Anschuetz et al. 2001). Although the space-place dichotomy can be invoked to study any culture, at any time and in any space, it has particular utility when considering hunter-gatherer cultures in the past, because of the unique relationships hunter-gatherers have with their environments and landscapes (Dwyer 1996). To a Western audience, nature is the “Other” to civilization: the undomesticated, lawless space we do not govern (e.g., Hodder 1995). This perception of nature, as an entity distinct from culture, is unique to societies and cultures that have intensified their resource production. For example, Dwyer (1996) suggested that intensification of agriculture by Siane society in Papua New Guinea led to the creation of "nature," a place lacking the cultural meanings invested in domesticated places. In contrast, he observed that Kubo and Etolo societies which relied more heavily on uncultivated resources did not make this distinction in their lexicon. Similarly, where a Westerner might see a wild and hostile jungle, the Nayaka of southern India describe that same environment as a giving parent, who disciplines and nurtures its children (Bird-David 1990). Embedded in this perception is an understanding that differs from our Western views of what "nature" is and how people interact with it.

In the ethnographic realm, Keith Basso and Peter Jordan have also demonstrated the power of places. Basso (1996) described how the Apache transplant place names to their post-removal landscape in an effort to recreate the same places. Jordan (2003) discussed how the Eastern Khanty in Western Siberia socially invested significance into places, despite the fact that, to a Western audience, there might appear to be little present to physically mark the place. Had archaeologists focused only on artificially constructed features, such important social places would have been overlooked. Based on these and other ethnographic examples, archaeologists have recently begun to examine seemingly "natural" locations, realizing that they could have been places with cultural significance to hunter-gatherers in the past. For example, Richard Bradley (2000) showed how seemingly "natural" places were in fact socially significant locations of ritual to the ancestors of the Saami in Scandinavia, using the archaeological record and oral histories to support his interpretations.

Phenomenology. In addition to examining the dichotomy between space and place, archaeologists also employ landscape phenomenology to study past places.

Phenomenology uses the senses and experiences of the human body as the primary means to investigate the world around us, based on the premise that bodily experiences are a human universal (Merleau-Ponty 1962). Developed first by the philosophers Edmond Husserl and Martin Hiedegger (Krell 1977) as well as Maurice Merleau-Ponty (1962), archaeologists began to incorporate phenomenology into their studies in the early 1990s. For example, in a 1994 book, Christopher Tilley outlined the ways researchers might apply a phenomenological approach to studying archaeological places. By recognizing that space is not simply a blank canvas that human actors use, but rather a series of places that are experienced by the human body, Tilley (1994) argued we can use our own bodies and senses today to investigate past places.

Although some have accepted, pursued, and defended this approach (e.g., Barrett and Ko 2009; Casey 1996; Boado and Vasquez 2000), others have identified significant problems with it. For example, Joe Brück (2005), Andrew Fleming (2006), and Matthew Johnson (2007) argue that although some bodily experiences might be universal, people interpret them through a cultural lens that, without written records or confidence in the direct historic approach, cannot be accurately interpreted. Other scholars, such as Mark Gillings (2012), have suggested that Geographic Information Systems (GIS) can replace phenomenology in landscape studies using analyses that allow us to explore the landscape without physically being part of it. Still others have suggested blending both GIS and phenomenology (Bernadini et al. 2013). Whether rooted in a "space vs. place" approach or in phenomenology, some archaeologists of the 1990s and 2000s shifted their interests from questions of subsistence strategies to ones privileging the social aspects of landscapes.

Contemporary Approaches to Landscape Archaeology

Today, as it did when considered one expression of post-processualism, the term "landscape archaeology" encompasses myriad methods, theories, and approaches to the large spatial scale of the archaeological landscape. Under the broad umbrella of landscape archaeology, four approaches appear most commonly in the literature: spatial analyses in GIS, space and place, paths on landscapes, and practiced or socialized landscapes.

Spatial Analyses in GIS. Archaeologists began using GIS to conduct spatial studies in the 1990s. Although there has been some debate as to whether archaeologists should consider GIS a method or a theory because of the Western way it displays space (Conolly and Lake 2006), GIS has clearly changed the way researchers have approached landscape archaeology. This change is largely due to the types of analyses GIS software can perform, including viewshed and least-cost paths. Viewshed analyses quantify what parts of a landscape are visible from a specified location (Vogel 2005). They can take a variety of forms, from simply quantifying the viewable areas from a given location to identifying specific topographic features observed at a site (Bernadini et al. 2013). Least-cost paths, which map the most efficient routes between two locations by taking into account the slope of the landscape and other impediments to travel (Herzog 2013), have been used to interpret polity sizes in the American Southeast (e.g., Livingood 2012) and to model trails used to access water in the American Southwest (e.g., Phillips and Leckman 2012).

Despite the utility of such GIS analyses, they are not without problems. Viewshed analyses suffer from an inability to consider the impacts of vegetation on a viewshed. Similarly, least-cost pathways cannot account for several considerations, such as assuming that people in the past had a perfect knowledge of the landscape to select the most optimal path or that many analyses rely on overly simple algorithms (Branting 2012). Although potential problems do exist with each of these analyses, they have nevertheless become useful tools for archaeologists wanting to investigate large landscapes.

Space vs. Place. Archaeologists also continue to use the dichotomy of space and place in their analyses, particularly to talk about hunter-gatherer landscapes. Robert Kelly (2003), for example, proposed that people learn their landscapes through the identification of unique landscape features that become important places in their worldview. Several studies have invoked lithic artifacts to investigate social landscapes. Chris Clarkson (2008) suggested archaeologists can use lithic artifacts to identify culturally significant places on the landscape by recognizing the social implications of transporting, accumulating, associating, and altering stone tools in particular locations. Others, such as Adam Brumm (2010) and Moira McCaffrey (2011), have shown that quarry sites can be significant places within social landscapes. Like earlier studies of space and place, archaeologists are expanding on the types of places they recognize as culturally significant.

Paths on Landscapes. Scholars have also recognized the importance that paths and trails play in people's landscapes. Heidegger was among the first to discuss the importance of paths as spaces in which we dwell between locations or places (Krell 1977). Using ethnographic and archaeological data, archaeologists have also discussed past paths as crucial elements of a landscape. Snead (2009) suggested that trails themselves are important places because of the cultural narratives and practices people associate with them. Zedeño and her colleagues (2009) similarly emphasize the importance of movement and trails to maintaining cultural identities as well as cultural boundaries in the world. Thus, paths are an essential component of people's landscapes that link places together and create networks of places.

Socialized Landscape. Of all the current approaches to landscape archaeology, the concept of socialized landscapes likely has the most utility to hunter-gatherer studies. Socialized or practiced landscapes build on notions of "space" and place" by seeking to understand the cultural narratives that link places together across a landscape through cultural practices. These socialized landscapes are the ways people created a meaningful world within their natural and cultural environment through their actions. Whereas some scholars have explored the idea of practice and practiced landscapes (e.g., Bourdieu 1977; Ingold 1993; Krell 1977; Sewell 1992), the approach I find most intriguing is rooted in Michel de Certeau's (1984) "Spatial Stories." According to de Certeau, spatial stories are narratives or accounts that weave together daily practices across a landscape. These landscapes are composed of *lieus*, *espaces*, *maps*, and *tours*.

De Certeau suggested that the *lieu* (or place) is what most traditionally associate with "space:" the order of things on a landscape that is "an instantaneous configuration of positions" that implies "an indication of stability" (De Certeau 1984:117). This order is set by cultural and natural laws that result in structuring the built and physical world. The *espace* (or space), on the other hand, is "a practiced *lieu*," or an "effect produced by operations that orient it, situate it, temporalize it, and make it function in a polyvalent unity of conflictual programs or contractual proximities" (de Certeau 1984:117). In other words, a *lieu* comes alive and becomes a meaningful *espace* when people conduct activities in the *lieu* and invest social meanings in it. Everyday actions and practices create an *espace* within and from a *lieu*. However, de Certeau's spatial stories would not be complete without a mechanism to link *espaces* together. To do so, he describes *maps* and *tours*. *Maps* are the plotted directions between *lieus*, whereas *tours* are the practiced paths between *espaces*. Through the links between culture and daily practice, *lieus*, *espaces, maps*, and *tours* are interwoven and cannot exist without each other (de Certeau 1984).

For archaeologists, the emphasis on actions and the link between *lieus* and *espaces* are key, for two reasons: 1) we cannot divorce a *lieu* from an *espace* created in and from it, and 2) everyday actions in an *espace* often leave traces in the material culture that we can identify. In other words, archaeologists find direct evidence of past *espaces* through the materials people left behind during the course of their actions and practices. This framework is particularly important for archaeologists who work with past hunter-gatherer populations because it connects all actions, from the mundane to the extraordinary, with a cultural and physical world (*lieu*). Although many archaeologists are already aware of it, de Certeau's theoretical orientation explicitly forces us to recognize that even actions such as resource procurement occur within a social context we must consider when discussing them.

Despite the seeming utility of this perspective, few archaeologists have explicitly used de Certeau's socialized landscape of *lieus* and *esapces* to theoretically orient their work. Cynthia Robin (2002) is a rare exception, operationalizing de Certeau's theory to analyze and interpret the social and practiced space and daily experiences at a Mayan site in Belize. Asa Randall (2015) also cites de Certeau's ideas, among those of other practice theorists, offering a potential means by which archaeologists can investigate both historical processes and socialized landscapes in deep time. Other archaeologists, however, have emphasized the importance of considering cultural practices in a space without explicitly referencing de Certeau. For example, Gerald Oetelaar and D. Joy Oetelaar (2011) used oral traditions to identify significant places on the Blackfoot social landscape and described how the very action of moving through their landscape created the spaces they valued. In these ways, archaeologists have recently used de Certeau's theory of the interconnectedness between *lieus* and *espaces* through actions to identify and discuss socialized or practiced landscapes in the past.

Landscape Archaeological Theories in the Rocky Mountains

Like Oetelaar and Oetelaar (2011), Rocky Mountain archaeologists have recognized socialized landscapes, both past and present, but without using the specific term "socialized." During the early 1900s, many scholars no doubt agreed with Ronald Ives's (1942: 462) perception of the mountains:

> About one-third of the [Rocky Mountains] did not have its present surface form until Folsom time. At least another third is so barren and cold that it could not have been occupied by primitive man. In the remaining third a normally healthy man, with a reasonably good bedroll, can camp out today without acute discomfort for about a hundred days in the year (Ives 1942: 462).

Because early 20th century archaeologists perceived so little of the mountains as habitable, most looked elsewhere to study the past. It was not until the 1930s and 1940s that the first scholars, working within the culture-history paradigm, began to investigate the archaeological record of the mountains (e.g., Hurst 1943). Among the first to consider larger scales of landscape in the mountains and adjacent regions was H. Marie Wormington. In addition to her well-known *Ancient Man in North America* (1939), she also authored several articles and books that described projectile point typologies and associated culture-histories of the southern and northern Rocky Mountains (e.g., Wormington 1948; Wormington and Forbis 1965).

Despite the fact that Rocky Mountain research began in the 1930s, it took decades for archaeologists to establish culture histories for the mountains and to pursue questions of subsistence and mobility strategies that lend themselves to processual approaches. An example of such research is the work of James Benedict. Benedict (1974) was one of the first to investigate sites at high altitude (>2,500m asl), including the Caribou Lake site in Colorado. He concluded that the site likely served as a seasonal hunting camp for people at 3,400 m. Other processual studies include Davis et al.'s (1988) study of the Barton Gulch site in Montana and Frison's (1992) research comparing and contrasting prehistoric subsistence strategies between the foothill-mountains and the adjacent plains.

These research questions continue to be asked today and shape our understanding of socialized landscapes, as more of the mountains see systematic study. For example, Bonnie Pitblado (2003) suggested that two different groups in the Late Paleoindian Period lived in the Rocky Mountains in different ways. Some, who made Jimmy Allen projectile points, preferred exotic chert for their points and tended to use the higher elevations, whereas others, who made Angostura points, used local quartzite and dwelt in lower elevations of the mountain basins. Craig Lee (2012) has also added to our understanding of mountain landscapes, by examining the way people took advantage of high altitude ice patches for summer hunting. These processual studies have and continue to contribute to our understanding of socialized landscapes by illuminating the everyday practices and behaviors people conducted in the mountains.

As mountains have received more systematic attention, scholars have addressed more specifically cultural meanings attached to landscapes. For example, using Clovis caches located both within and outside of the mountains, Gillespie (2007) argued that the makers of the Clovis projectile points socialized and colonized their new landscape by leaving place-creating caches across their landscape. Similarly, Pitblado (2017) suggests that the Rocky Mountains were critical in the peopling of the Western Hemisphere because the mountains both provided resources and represented sacred places to those people who lived near and in them.

Laura Scheiber and Judson Finley (2011) invoked changes in obsidian sources utilized by people in the Absaroka Mountains to argue that in the Protohistoric Period, people used their mountain landscape as a refuge from encroaching white settlers and other tribes. In this case, the mountains served as more than just a source for resources, but also as a safe place in a changing world. Similarly, Maria Nieves Zedeño (2015) blended the idea of centrality used by processual archaeologists to understand subsistence strategies in optimal foraging theory with the idea of socially significant places to investigate mountain sites important to Blackfoot people. Zedeño (2015) showed how seemingly "functional" camp sites served as hubs for members of Blackfoot community during their transition to reservations and when their social landscape was being fundamentally altered. Although the term "socialized landscape" does not appear in these publications, these scholars nonetheless apply de Certeau's concepts by discussing how people interacted and attached meaning to their landscapes in the recent and deep past.

Summary

Landscape archaeology is not a new approach to the study of the past. Culture-historical archaeologists used single-site typologies to understand landscape-scale patterns, and processual archaeologists have and continue to study settlement patterns and questions of subsistence and procurement strategies at the landscape scale. More recently, using post-processual theories, archaeologists have begun to investigate the social components of landscapes. Rooted in post-processual concerns, de Certeau's *espaces* and *lieus* on a socialized landscape are useful concepts for probing how people organize and dwell in the world around them. Ethnographic and archaeological examples show that globally people generate culturally meaningful landscapes through places and paths that created and maintained through their daily use. Archaeologists working in the Rocky Mountains and elsewhere around the world have successfully identified and interpreted past social landscapes, although they often do not use de Certeau's terminology their discussions. Despite the lack of the use of the formal term "socialized landscapes," the literature from the Rocky Mountains demonstrates that archaeologists working under all paradigms have recognized such landscapes in the mountains.

Chapter 3: Developing a Methodology to Identify Socialized Landscapes

As discussed in Chapter 2, landscape archaeology, including the study of socialized landscapes, is well established within the discipline of archaeology. Archaeologists have identified and interpreted components of socialized landscapes across the world and throughout time, including in the Rocky Mountains (e.g., Gillespie 2007; Oetelaar and Oetelaar 2011; Pitblado 2017; Scheiber and Finley 2011; Zedeño et al. 2009). Among the different theoretical orientations that can frame discussions of socialized landscapes, I believe the one with the most potential for effectively interpreting hunter-gatherer social landscapes is de Certeau's (1984) concept of *espace* (or space), *tours*, and socialized landscapes. Although they do not invoke de Certeau specifically, Rocky Mountain archaeologists including María Nieves Zedeño (2015) and Laura Scheiber and Judson Finley (2011) are among those scholars who have successfully studied and interpreted mountain socialized landscapes dating to the recent past. Using similar frameworks as de Certeau (1984), they rely heavily on oral histories and Euro-American historical documents to draw their interpretations. However, the problem of identifying and understanding specific socialized landscapes in deeper time (the Paleoindian and Archaic periods between 13,000 and 1,500 years ago) persists principally due to the subtle nature of the early archaeological record in the mountains. In this chapter, I develop a set of archaeological expectations to overcome these challenges, framed theoretically by de Certeau's (1984) concept of *espace* and *tours*, to identify hunter-gatherer landscapes in the Rocky Mountains.

Using de Certeau's (1984) *Espace* and *Tour* for Social Landscapes in the Rocky Mountains

I use de Certeau's concepts of *espace* (again, a practiced space created through people's actions within a cultural and natural setting) and *tour* (a practiced path between *espaces*) as an organizing theoretical framework to identify socialized landscapes in the mountains for three reasons: 1) they are archaeologically visible; 2) they include a range of actions and behaviors, due to the role of *tours* between *espaces*; and 3) when taken together, *espaces* and *tours* create a socialized landscape.

With regard to the first point, de Certeau asserted that "'space is existential' and 'existence is spatial'" (de Certeau 1984: 117). To live or to dwell in an *espace* means that people's experiences and actions become interwoven with the cultural and physical elements of the *lieu* (or place) around them. The physical residues of the practiced *espace* then become visible and detectable in the archaeological record through the objects people used in those actions. For example, the act of sharpening an obsidian chipped stone knife or etching a petroglyph into sandstone transforms a *lieu* into a meaningful *espace*, visible to archaeologists. However, *lieux* consist of not only the physical realm but also of cultural and societal structures, that impose invisible barriers and avenues for practice. As a result, a *lieu* can be more difficult to identify than an *espace* in the archaeological record, especially on a landscape consistently characterized largely by lithic scatters. Thus, the concept of the *espace* offers us a glimpse into socialized landscapes without the need for oral traditions and histories to aid interpretations.

In terms of the second point above, *espace* includes not only extraordinary spaces of ritual activities, such as rock art or vision quest structures, but also the ordinary spaces where people practiced everyday life, such as campsites and quarries. Because the majority of archaeological sites visible in the Rocky Mountains are lithic scatters, the notion of *espace* allows us to use *all* sites found in the mountains to interpret socialized landscapes, rather than focusing on the few sites that obviously represent past symbolic activity.

Finally, with regard to point three, de Certeau's (1984) concepts of *maps* and *tours* allow us to link together meaningful *espaces*. De Certeau suggests that people experience their landscape in two different ways: through *maps* and through *tours*. His *maps* are locational descriptions of spatial relationships between *espaces*. *Tours* describe paths people take between *espaces* on their landscape. For example, de Certeau might suggest that I *map* my apartment by stating that the kitchen is to the left of the living room. In contrast, I create a *tour* of my apartment by explaining that to reach the kitchen from the living room, you would exit the living room, which is blocked off by the furniture, by walking around the couch and then turning left, and taking a second left to enter the kitchen. The *map* describes spatial relationships, whereas the *tour* describes the practiced path taken to reach one *espace* from another. The notion of *tours* is familiar to archaeologists (e.g., Oetelaar and Oetelaar 2011; Snead 2009; Zedeño et al. 2009 – see Chapter 2), who have long recognized the social importance of paths at the scale of landscapes, even though they not used de Certeau's specific term.

In short, in some cases, archaeologists have already applied these ideas to the archaeological record, but de Certeau's (1984) concept of the *espace* and the *tour* offers us a unifying framework with which to approach socialized landscapes. I follow de Certeau's (1984) lead and invoke the concepts of *espace* and *tour* to investigate socialized landscapes in the Rocky Mountains.

The Challenge of Identifying Socialized Landscapes in the Rocky Mountains

Rocky Mountain archaeologists face one particularly significant challenge when identifying *espaces* and *tours* on socialized landscapes: the nature of the mountain archaeological record. Unlike Robin's (2002) Mayan village where she *maps* the paths between *espaces* using a rich material record replete with architectural features, the people who lived in the Rocky Mountains left behind a much more subtle record, often without permanent architecture. Their archaeological record consists largely of chipped stone lithic scatters, along with an occasional rock art site or rock features such as cairns, stone circles, and pithouses. Additionally, with few exceptions (e.g., caves and ice patches), preservation of organic artifacts is poor at mountain sites, because erosion and acidic soils degrade bone and wood materials quickly. As a result, archaeologists have been more successful at understanding subsistence and resource procurement strategies than more nuanced social behavior.

Questions of social meaning, especially when tied to places, are harder to answer through assemblages composed largely of chipped stone tools and associated debitage than those with large architectural features, ceramics, and other rich material records. Some mountain archaeologists have circumvented this problem by applying the direct historic approach to their studies of the archaeological record. The direct historic approach interprets archaeological data by invoking oral traditions and histories of related descendant communities to inform observable patterns (Wylie 1985). Archaeologists have successfully used this approach only when working in late time periods, where they can reasonably apply oral histories to interpretations because cultural affiliation of the archaeological record and its associated descendant community have been established. In contrast, as Alison Wylie (1985) has cautioned that archaeologists working in deeper time cannot rely on this approach when there is not a direct cultural link between oral traditions of the descendant community and the archaeological record.

Accordingly, studies of socialized landscapes in the mountains have focused on the Late Pre-Contact period (1,500 to 200 years ago). For example, Zedeño and her colleauges (2014) worked with Blackfoot people, using their oral traditions and early 20th century ethnographies to understand how their ancestors transformed their physical and cultural landscape by constructing drivelines. Utilizing oral traditions alongside the archaeological record, cultural practice and *espaces* from a socialized landscape can be explicitly linked through the knowledge and memories of living people.

However, for the Paleoindian (13,000 to 8,000 years ago) and Archaic (8,000 to 1,500 years ago) periods, we cannot so readily apply oral histories and traditions to aid in identification and interpretation of the *espace* and *tour* on socialized landscapes. As a result, the few archaeologists who have sought to identify and understand social landscapes in deep time have been forced to develop alternative solutions. As first described in Chapter 2, Jason Gillespie (2007) embraced a phenomenological approach to understand the perceptions of the landscape by makers of Clovis projectile points. He suggested that the people who made Clovis projectile points colonized their landscape by creating caches. The act of burying items in a cache transformed an area into their own socialized landscape by creating place-markers (Gillespie 2007). Although some might view his argument as flawed because he links it to the Clovis-First model of the peopling of the Americas, Gillespie nevertheless offers one way to interpret Clovis social landscapes: through practice.

In a similar vein, Bonnie Pitblado (2017) highlighted the potential attraction of mountains to the people who first populated to the Western hemisphere. She argued that these landscapes were a magnet for the people in the Late Pleistocene based on myriad unique mountainous resources, both material and cultural. In her argument, Pitblado suggested that people’s attraction to mountain landscapes began long before they arrived in the Americas, because their ancestors had created vast social landscapes in the Altai Mountains and other northeast Asian mountain ranges. In other words, mountains were an essential component of the socialized landscapes for the ancestors of the Paleoindian people, not only because they offered similar resources in a compressed geographic area, but also because people incorporated those landscapes into their culturally constructed worldview through their practice.

With the exception of scholars such as Zedeño et al. (2014), Gillespie (2007), and Pitblado (2017), most archaeologists have not attempted to maneuver around the difficulties posed by the lithic-heavy nature of the archaeological record in the mountains to discuss socialized landscapes. Sites such as lithic scatters challenge archaeologists if we assume that they offer little in the way of social information about people and their culture in the past and if, as a result, we focus solely on sites with clear evidence for their social role in a people’s culture. Although archaeologists working in other regions such as the American Southwest or Southeast certainly encounter lithic scatters, they also have architectural features such as pueblos or mounds to factor into their analyses. Because of the effort required of people in the past to construct such features, they seem easier to socially interpret than ubiquitous lithic scatters within a social setting.

However, those of us working in the Rocky Mountains encounter fewer instances of permanent architectural features, because of the different degrees of mobility and sedentism people practiced. Although the mountains do yield evidence for ceremonial sites, such as rock art, medicine wheels, and vision quest locations, as well as for residential structures in later periods in the form of stone circles and pithouses, many of the sites documented in the mountains are lithic scatters. For example, in the Gunnison Basin of Colorado (encompassing three counties), during the 12,000 years that people dwelt in the mountains, 2,579 of 5,982 sites (43%) are described by archaeologists as lithic scatters. I argue that to understand de Certeau's (1984) *espace* and *tour* on socialized landscapes we must find a way to incorporate these challenging sites into our analyses. Without them, archaeologists can only "see" only a tiny portion of socialized landscapes from the deep past.

Overcoming the Challenge: Developing a Methodology

To overcome the challenge presented by the nature of the Rocky Mountain archaeological record, I propose a new methodology, specific to the Rocky Mountains, to aid archaeologists in interpreting socialized landscapes. I have created a set of expectations against which we can check our observations from the archaeological record to determine what kind of landscape is present. I direct these expectations at the two units of socialized landscapes visible through past practice: the *espace* and the *tour*. Laura Scheiber (2015) has defined different types of socialized landscapes in the mountains that can be usefully invoked to frame my expectations. Specifically, she describes the four ways people in the present and past view the mountains: as resources, symbols, wilderness, and refuges. To this list, I add the recreational landscape, which draws people to the mountains for entertainment, and a composite landscape type, which embodies two or more of the five landscape types. I operationalize Scheiber's (2015) tropes by identifying the expected archaeological signatures for each type of landscape and testing them in a case study. I show these landscape types and archaeological expectations in Table 3.1 and discuss each one below. If archaeological signatures match one of these categories, it constitutes evidence that can contribute to our understanding of socialized landscapes of past Rocky Mountain hunter-gatherers.

Table 3.1. Table of archaeological expectations to identify socialized landscapes in the Rocky Mountains, based on Scheiber's (2015) mountain landscape tropes.

Landscape Type	Definition	Physical Evidence for *Espace*	Physical Evidence for Tours
Resource	A landscape from which people secure material goods, such as knappable stone and other raw materials, edible or medicinal plants, or animals for food and (or) raw materials.	The majority of sites indicate procurement activities: quarry sites, kill and (or) processing sites, and groundstone tools as evidence of plant processing. Site locations will be functional, and situated near targeted resources.	Paths follow the most efficient routes across the landscape.
Symbolic	A landscape in which people have invested symbolic meanings through actions or through place names that reference oral traditions.	There is one or more sacred site(s) present (e.g., vision quest, rock art, or medicine wheel sites) and (or) place-marker sites. Site locations will not be selected for purely functional, resource-driven reasons.	Paths may or may not follow the most efficient routes across the landscape. Long-term use of paths also creates place-markers.
Wilderness	A landscape devoid of people.	There is no evidence for people of a given culture; the area will be archaeologically sterile.	There will be no evidence for paths.
Refuge	A landscape to which people retreat under social or climatic stress.	Evidence of insular behaviors, such as a preference for locally available materials; requires a large geographic area to identify.	Paths may or may not follow the most efficient routes across the landscape.
Recreation	A landscape people seek out for entertainment (e.g., Western perceptions of mountains as recreation areas).	Evidence indicates a light use of the landscape, such as short-term campsites, and will reflect activities rarely conducted on a daily basis within that culture (e.g., contemporary Euro-Americans camping and fishing).	Paths may or may not follow the efficient routes across the landscape.
Composite	A landscape at a defined spatial scale that contains two or more of the five landscape types.	Signatures from two or more types are present.	Signatures from two or more types are present.

Mountains as Resources

Scheiber (2015) identified the one of the cultural perceptions of the mountains as that of a landscape of resources. She and other scholars (e.g., Byers et al. 2003; Pitblado 2003) have long highlighted the unique resources available in the mountains, such as different plants, animals, and lithic raw materials that may be unavailable in adjacent regions. As a result, archaeologists routinely identify the archaeological signatures of such behavior in the *espaces* where they occurred. For example, quarry sites and evidence of cortex removal near such sites indicate lithic raw material procurement. Kill and (or) processing sites show remnants of the use of faunal resources on a landscape. Ground stone tools at campsites can suggest people were processing plant materials. I expect *tours* linking the *espaces* together to be the most efficient paths on a landscape, indicating a primary interest in accessing a given resource. To identify a resource landscape, we should expect that procuring material resources was the primary motivation for visiting the mountains.

Mountains as Symbols

The second trope and social landscape that Scheiber (2015) identified focuses on the symbolic role mountains often serve in societies. The symbolic role of mountains, according to Scheiber, falls into one of two categories: sacred symbols and place-markers. Through oral traditions and histories, some mountains become sacred symbols when they are identified as locations of mythical or historical events (e.g., Oetelaar and Oetelaar 2011). Other mountains are made sacred when people conduct ritual activities within them. Archaeologists can see evidence of the sacred nature of mountains, through physical evidence of ritual activities, including vision quest, rock art, and medicine wheel sites.

To identify mountains as place-marker symbols is more difficult archaeologically, because these symbols are often identified through oral traditions (e.g., Scheiber 2015). However, at least two approaches may offer alternative means to identify place-markers, by using material evidence of practice as well as GIS viewshed analysis. According to Clarkson (2008), we can identify a significant, social *espace* through the accumulation of lithic artifacts at a site because this accumulation suggests that people visited the location either repeatedly or intensely for a single episode, which assumes that the location held some significance for people. We can also use the association of the artifacts and a site with other features on a landscape to identify a symbolic, place-marker *espace* because, as Bradley 2000 and Clarkson 2008 suggest, people will situate themselves near features they value. These features might be adjacent to the site (e.g., Bradley 2000) or they might appear in a site's viewshed (Bernadini et al. 2013).

Tours can also become place-markers in and of themselves when continually used and maintained over time (Snead 2009). Paths can be paved or otherwise constructed to become place-markers, or can be travel corridors, identified by modeled least-cost paths in ArcGIS and consistently located sites adjacent or on these paths. *Tours* that are not place-markers may or may not fall along the most efficient routes through a mountain, because cultural values may determine whether certain areas can be traversed or not. Although they may be efficient trails, symbolic *tours* can become archaeologically visible when they deviate from modeled efficient routes through a landscape using a least-cost path analysis in ArcGIS.

Mountains as Wildernesses

Scheiber (2015) also suggested that some people perceive mountains as a wilderness, or environments in which people do not and should not live on a permanent basis. The Merriam-Webster Dictionary definition of the word “wilderness” in fact states that such an area is “uncultivated and uninhabited by human beings” or is “empty or pathless” (Merriam-Webster 2017). This perception is particularly common in Euro-American societies, including the United States (e.g., Ives 1942). For example, in the United States, in 1964 it led to the creation of the Wilderness Act, which officially designated some mountain areas as wilderness areas and afforded them legal protections from development and vehicle use under the law. This law does not prohibit recreational use of the landscape (see “Mountains as Recreation” below), but the intent is to preserve an area that seemingly does not reflect evidence of human tampering. Although it is unclear to what extent people in the past may have held similar views, we would expect that the archaeological record associated with the people holding this belief would be absent in the perceived wilderness area.

Mountains as Refuges

People have often used mountains as refuges from social or climatic stress (Scheiber 2015). For example, some scholars have interpreted past people as having used the mountains as a refuge during climatic events such as the hot, dry Altithermal

(c. 9,000 to 5,000 BP) (Benedict 1979) or more recently in the face of Euro-American colonization (Scheiber and Finley 2011). Based on the evidence used to make these arguments, we can expect that when people perceive mountains as a refuge, their activities will be largely constrained within the refuge area, compressing resource and symbolic landscapes into a single landscape. In other words, we should be identifying a portion of a people's territory that will include multiple landscape types. We should also expect a prevalence of local lithic materials over exotics, because access to the latter may be restricted (e.g., Scheiber and Finley 2011), or a change to new or maintenance of old technologies, different from those in adjacent areas (e.g., Pitblado 2003; Sassaman 2011). However, to identify such a landscape, archaeologists must work at a large geographic scale. Otherwise, we risk identifying only a subset of the landscape, such as the resource or symbolic component, instead of recognizing them as part of the whole.

Mountains as Recreation

Cultures, such as that of contemporary Euro-Americans, also use mountains for recreation, such as to escape from sedentary lives in towns and cities. In modern cases, people camp, hike, hunt, and fish – activities which are markedly different from those in their daily lives. For example, those living in the western United States often use lands owned by the National Park Service, Forest Service, and Bureau of Land Management for recreational purposes. These lands can include areas that are legally designated as "wilderness areas," because the legal definition only restricts construction and vehicular use, but allows for the light impacts of recreational camping and hiking. If people in the past also used mountains for recreation, then we might expect these *espaces* to represent activities that are not typical in the culture on a daily basis. *Tours* within this landscape may not follow functional paths to meet people's recreational goals rather than efficient movement.

Mountains as Composite Landscapes

Finally, mountain landscapes can encompass two or more of the five landscape types. Depending on the defined geographic extent of a focal landscape, these tropes may operate side by side or interwoven into the same spatial scale. For example, the way the ancestors of Shoshone people dwelt in the Absaroka Mountains during the Protohistoric Period embodies both refuge and resource landscapes. They procured available resources as they had done for centuries previously, but also restricted their lives to the mountains because of encroachment of other tribes and Euro-American settlers into their larger territory (Scheiber and Finley 2011). If we expand the search for socialized landscapes to the level of a cultural territory, we should expect to identify each trope represented within and outside of the cultural boundary, because such a territory represents the center of the world for a people (e.g., Oetelaar and Oetelaar 2011; Zedeño et al. 2009). Thus, depending on the social scale we examine, we may identify multiple landscape types in the mountains.

By operationalizing Scheiber's (2015) tropes of mountain landscapes, I have established archaeological expectations against which we can compare the archaeological record of mountain settings. To conduct such testing, the mountain landscape in question must meet two prerequisites. First, archaeologists must have conducted enough research there to have significantly documented past use of the landscape. We cannot understand the social implications of a landscape if archaeologists have only surveyed or tested a small portion of it. Second, archaeologists must have chronological control over the archaeological record. Because socialized landscapes and the *espaces* and *tours* within it are first and foremost social constructions within a *lieu*, we must be able to control for time to ensure we are not confusing signatures of distinct socialized landscapes. To establish chronological control over a defined area, archaeologists always prefer to rely on absolute dates derived from excavated contexts. However, because many sites in the mountains are unexcavated lithic scatters, relative dates from projectile point typologies or other "index fossils" can provide that control. If a geographic area meets these criteria, then an archaeologist can proceed to explore what type of socialized landscape is present.

Applying Landscape Criteria through Analyses

Once an area has been selected and chronological control established, we can analyze the archaeological record in the Rocky Mountains for evidence of the different types of socialized landscapes using the archaeological expectations I established (Table 3.1). These expectations target the two observable components of a social landscape: the *espace* and the *tour*. Because the archaeological record in the Rocky Mountains consists largely of lithic scatters, archaeologists can use four analyses to evaluate the expectations by identifying *espaces* and *tours*, both by time period and (or) culture.

Espace *Analyses*

To identify differing *espaces* in the Rocky Mountains, archaeologists can use three of the aforementioned analytical strategies and approaches: identification of site type and function, site-location selection over time, and viewshed analysis. It is essential to interpret the site type to understand what activities and practices people conducted in the past, because they define the *espace* people created through their daily actions. To recognize site type, archaeologists can use the artifact assemblages and features at each site, as well as supporting data such as usewear or protein residue analyses on tools.

For excavated sites where entire assemblages could be confidently dated in context, these site-function identifications are straightforward. However, many sites in the mountains are palimpsest surface sites with only the projectile points at each site to date the activities. As a result, the resulting site types reflect an accumulation of *espaces*, rather than those specific to certain times, people, and cultures in the past. Nevertheless, because site types are important to determining which socialized landscape types are present, at this stage of developing the methodology, I suggest they must be included in any analysis.

The climate in the Rocky Mountains has also changed over time, impacting the ecozones in the mountains. Where paleoenvironmental data is available, archaeologists can compare changing ecozones to site locations to determine if site locations changed as ecozones changed. If so, the change suggests that site locations were tied to nearby available resources and thus part of a resource landscape. Conversely, if site locations remained consistent despite changing ecozones, this suggests that people selected site locations for reasons other than resource availability.

Finally, archaeologists can also use ArcGIS to conduct individual viewshed analyses from sites of each time period in an area, to determine if there are geographic features people may have chosen to view from their *espaces*. Scholars have shown that people often select a site's location based on significant features they can see from that place. Although a GIS analysis cannot factor in the effects of vegetation on viewsheds, it can offer a baseline of visible features that the researcher can then evaluate as possible place-markers. If people during a certain time period consistently selected specific geographic features to view from their sites, then it is possible those features might be place-markers, indicative of a symbolic landscape.

Tour *Analyses*

To identify *tours* and the types of social landscapes to which they are linked, archaeologists can conduct a least-cost path analysis using ArcGIS. By creating a model of efficient paths across a landscape with random points as did Devin White and Sarah Barber (2012), we can compare site locations against the modeled paths. Sites linked by these paths indicate that these may have been the *tours* used by people in between different *espaces* and were a part of a resource landscape. Conversely, if sites are not linked by these modeled paths, then people may have used other *tours* between *espaces*, as expected for symbolic landscapes.

Through the results of the four analytical strategies, I suggest that archaeologists can use these expectations to determine what types of socialized landscapes are present in the Rocky Mountains.

Summary

Understanding *espaces* and *tours* in the Rocky Mountains is not without its challenges. People who called the Rocky Mountains home did not often leave behind permanent structures, which are inherently more easily interpreted as parts of a socialized landscapes. Additionally, archaeologists and cultural anthropologists who study spaces have often focused on extraordinary, ritualized spaces, whereas few have studied the role of ordinary spaces in these areas. Working with Scheiber's (2015) mountain landscape tropes and de Certeau's (1984) concepts of the *espace* and the *tour*, I have outlined a set of archaeological expectations designed to identify different types of socialized landscapes in the past. If an archaeological record in the mountains matches expectations for a resource, symbolic, wilderness, refuge, recreation, or composite mountain landscapes, then this suggests a successful identification and interpretation of socialized landscapes in the Rocky Mountains. It does so, moreover, using all available evidence, including the surface lithic scatters which are abundant in the mountains. In the following chapters, I test the outlined archaeological expectations in a pilot study of the archaeological record in the Bridger Mountains, Montana.

Chapter 4: Pilot Study Area Background Information

Of all the mountain ranges in the Rockies, I decided to select the Bridger Mountains in southwestern Montana as the pilot study area to evaluate my archaeological expectations of socialized landscape types for several reasons. The Bridger Mountains are a small front range of the northern Rocky Mountains, stretching 38 km north-south and 10 km east-west, located northeast of Bozeman, Montana. Their relatively smaller size allows me to conduct a pilot study of my expectations within the scope of a master's thesis. The Bridger Mountains also meet the two prerequisites for landscapes described in Chapter 3: they have been systematically studied and their archaeological materials can be at least generally dated. In contrast to adjacent ranges in the region that have received little systematic attention, archaeologists have investigated the Bridger Mountains beginning in the 1950s and have continuing throughout the second half of the twentieth and twenty-first centuries through cultural resource management work. Jack Fisher (Montana State University) and Walter Allen (Gallatin National Forest) conducted the first and only systematic academic surveys in the 1990s and 2000s, which yielded 176 projectile points that provide chronological control over the sites in my study area.

The Natural Place of the Bridger Mountains: Geology and Environment

A north-south trending front range of the Rocky Mountains in southwestern Montana, the Bridger Mountains consist of prominent peaks, including Sacagawea, Hardscrabble, and Ross; several subalpine basins; two subalpine lakes; and two prominent passes: Flathead and Ross (Figures 4.1-3). The highest point, Sacagawea

Peak, is 2,946 m above sea level (asl), roughly 900 m above the floor of the Gallatin Valley.

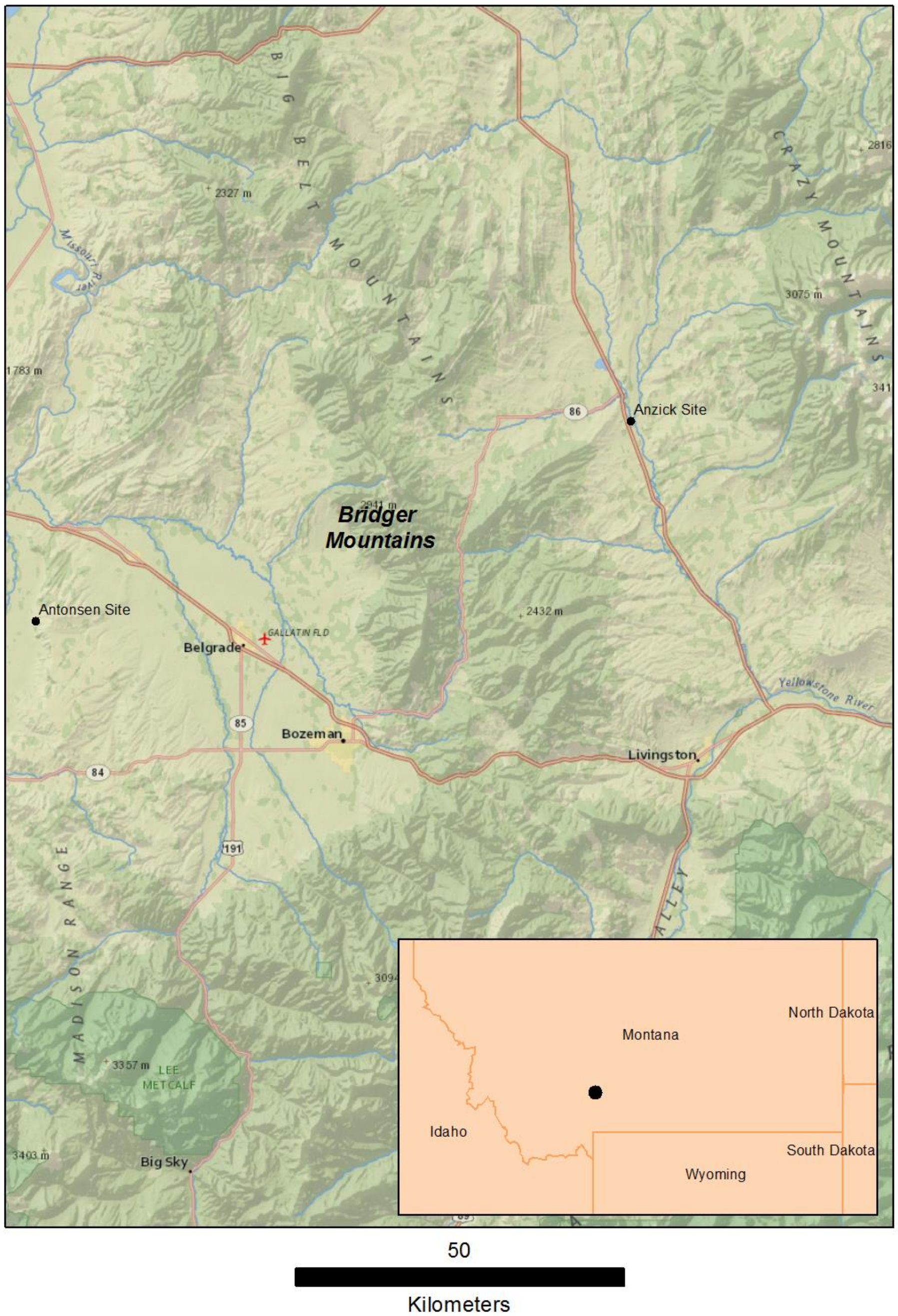


Figure 4.1. A map of the Bridger Mountains, Montana, showing key geographic features and significant neighboring sites.

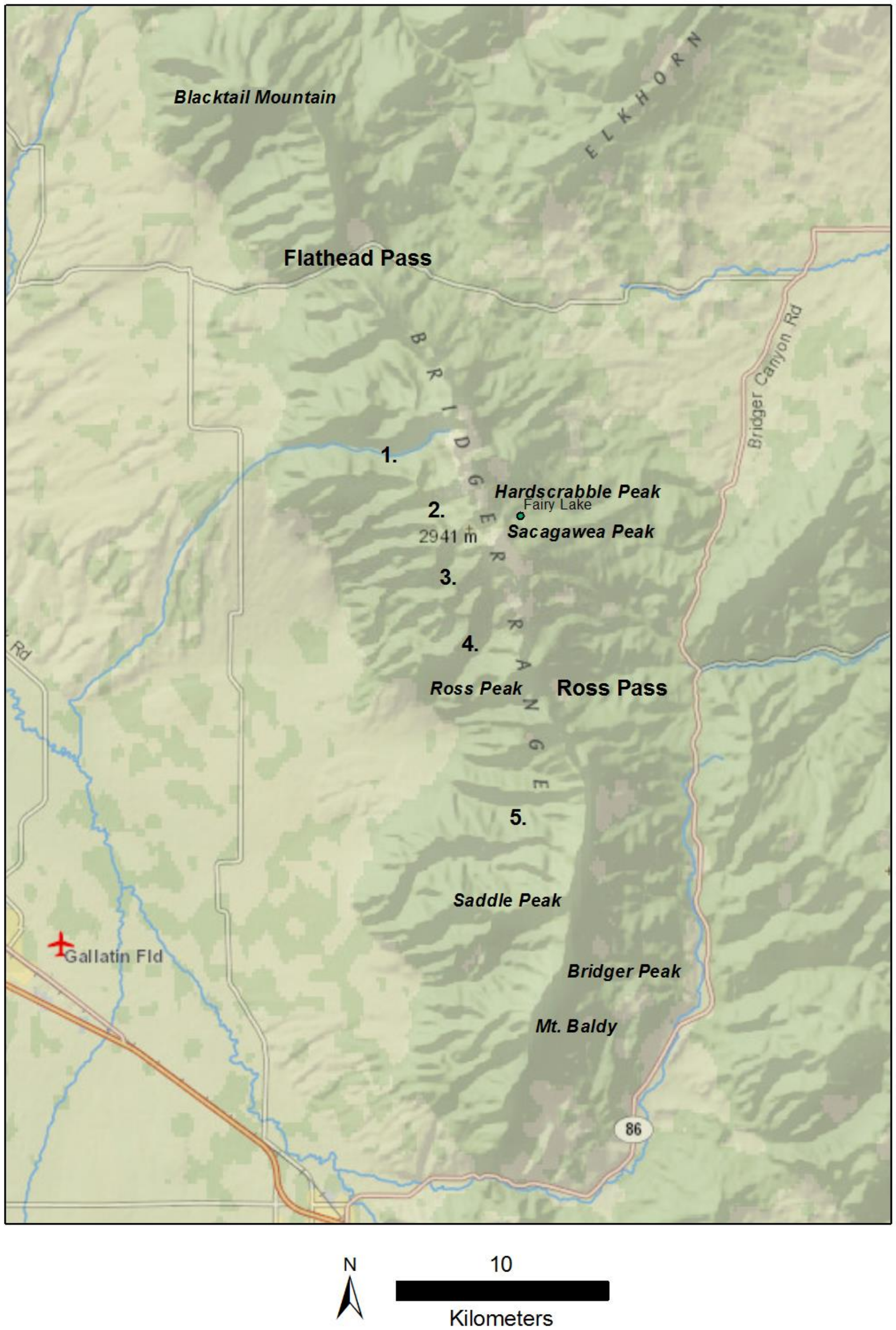


Figure 4.2. A map of the Bridger Mountains with prominent mountains, travel corridors, and major drainages labelled: 1. North Cottonwood Canyon, 2. Tom Reese Creek Gulch, 3. Corbly Gulch, 4. Limestone Canyon, and 5. Bostwick Canyon.

Figure 4.3. The eastern slopes of the Bridger Mountains. From this location, Ross Pass (on the left) and Flathead Pass (on the right) are clearly visible from the Shields River Valley. (Courtesy of Mike Cline)

Geology

The Bridger Mountains, composed of rocks ranging in age from Precambrian to Cretaceous, resulted from two phases of folding and faulting (McMannis 1955). The two orogenies and subsequent erosion during the Quaternary Period exposed a single outcrop of a silicified siltstone from the Cretaceous, and it is only known knappable material in the mountain range. Known as Bridger Silicified Siltstone (BSS), the rock outcrops near the apex of Hardscrabble Peak (24GA1635) (Figure 4.4). Although the material is poor in quality when first quarried, heat treatment transforms the original tan material into a deep red that is more easily knapped (Bob Donahoe, personal communication, 2015) (Figure 4.5).

Figure 4.4. Picture of the BSS exposure (indicated by red arrow) on Hardscrabble Peak in the Bridger Mountains, facing north. The quarry site is located on the western slope of the peak. (Courtesy of Bob Donahoe, avocational archaeologist)

Figure 4.5. Picture of naturally occurring, tan BSS and heat-treated, red BSS. (Courtesy of Jack Fisher, MSU)

Current Environment

Today, the Bridger Mountains have a continental climate, with short, three- to four-month long summers and long winters. Temperatures average 20° C during the day and 4° C at night during the summer, with winters averaging 0° C and reaching lows of -18° C (Benes 2016; Byers et al. 2003; McCurdy 1997). This climate, along with the elevation, supports five distinct ecozones in the Bridger Mountains: shrub-grassland and open-growth forest, encompassing grasslands, shrubs, and open forests at the valley floor to alpine zones at the mountain peaks (see Appendix A) (Davis and Shovic 1996; Pfister et al. 1977).

Of the resources available in these ecozones, Byers and his colleagues (2003) argue that Pre-Contact groups likely targeted mule deer and whitebark and limber pines as primary resources. Mule deer today follow regular, predictable paths across the Bridger Mountains (Pac et al. 1991), and, therefore, during the summer months, could have provided a reliable faunal resource. Archaeological and ethnographic research reinforce that people targeted the nuts of the whitebark and limber pines found above 2,195 m asl in the Bridger Mountains (Frison 1983; Marshall 1977; Stewart 1938). Although Byers and his colleagues (2003) also list a number of other floral resources present in the Bridger Mountains, they suggest that mule deer and the whitebark pine nuts may have played the most significant role in shaping how people used the mountains in the past.

Paleoenvironment

Rocky Mountain archaeologists have long recognized that Pre-Contact groups took advantage of their vertically stacked ecozones and the diverse resources they provide in a compressed space (e.g., Metcalf and Black 1997; Pitblado 2003). In addition, these “stacked” ecozones are particularly sensitive to environmental change, with ecozone boundaries shifting up and down with climatic oscillations. In the Bridger Mountains, archaeologists have access to a detailed account of the past environments and paleoclimate models for the mountain range itself, as well as those for several adjacent ranges in the region. James Benes (2016) conducted a paleoecological study of the Bridger Mountains using pollen core data collected from Fairy Lake on the eastern slope of the mountains (Figure 4.2). His study revealed evidence for five major climatic changes around Fairy Lake at ca. 2,304 m asl, over the course of 15,500 years (Table 4.1).

Table 4.1. The different climates and environments in the Bridger Mountains over time, based on Benes (2016). Results center on Fairy Lake and similar subalpine elevations.

Climatic Period	Years cal. BP	Corresponding Archaeological Period	Vegetation Present	Environment Surrounding Fairy Lake
Late Glacial	15,500 - 10,500	Early Paleoindian	Sagebrush (*Artemisia*); *Alnus* shrubs (related to alders); *Betula* shrubs (related to birch trees); *Salix* shrubs (related to willow trees)	Alpine tundra
Early Holocene	10,500 - 7,100	Late Paleoindian and Early Archaic	White-bark pine (*Pinus albicaulis*); lodgepole pine (*Pinus contorta*); fir (*Abies*); spruce (*Picea*)	Open forest of white-bark pine and other conifers
Middle Holocene	7,100 - 3,000	Early and Middle Archaic	Douglas fir (*Pseudotsuga*); white-bark pine (*Pinus albicaulis*); variety of herbaceous plants	Douglas fir parkland, with open landscape
Late Holocene	3,000 - 745	Late Archaic and Late Pre-Contact	Pines (*Pinus*); spruce (*Picea*); firs (*Abies*); aspen trees (*Populus*); variety of herbaceous plants	Mixed conifer forest of pines, spruce, and fir with meadows and aspen groves

During the Late Glacial Period from 15,500 to 10,500 cal. BP, alpine tundra dominated the subalpine basins in the range. Benes (2016) noted that although adjacent mountain ranges showed some cooling associated with the Younger Dryas (c. 12,900 to 11,700 BP), the data from Fairy Lake suggests the climatic episode had little impact in the Bridger Mountains. An environmental change occurred between 10,500 and 7,100 cal. BP during the Early Holocene Period, corresponding with the Altithermal (Benes 2016). This period of warming coincided with the spread of white-bark pine open forests and increased forest fires. The Middle Holocene Period (7,100 – 3,000 cal. BP) supported Douglas fir parklands and open landscapes and showed decreased but still present fires (in contrast to the Early Holocene). The final climatic period, the Late Holocene (3,000 to 745 cal. BP), saw mixed conifer forest of pines, spruce, and fir along with meadows and aspen groves. Although the Little Ice Age occurred during this time, Benes (2016) found no evidence of any impact at Fairy Lake.

The Culture History of the Bridger Mountains

In addition to understanding the geologic and environmental characteristics of the mountains, it is also important to understand the culture history of the region surrounding the Bridger Mountains before attempting to identify their socialized landscapes. In the northern Rocky Mountains, as elsewhere in the Rockies and the Plains, the culture history comprises three periods: the Paleoindian, Archaic, and Late Pre-Contact Periods. Understanding these culture histories in the Bridger Mountains *per se* thus far derives largely from adjacent regions of Rocky Mountains.

Paleoindian Period (13,050 – 8,600 BP)

There is currently no concrete evidence for a pre-Clovis occupation of the Rocky Mountains. The earliest documented people in the region lived during the Paleoindian, at the end of the Pleistocene and beginning of the Holocene Epochs. Archaeologists in the region conventionally subdivide it into the Early and Late Paleoindian Periods.

Early Paleoindian Period (13,050 – 10,500 BP). The earliest evidence for people in the region is associated with the Clovis archaeological culture. Clovis projectile points (Figure 4.6), the diagnostic indicators of the archaeological culture, have been recorded across the United States and Mexico, including at a number of sites in the mountains themselves (Kornfeld 1999). Archaeologists debate whether the people who made Clovis projectile points practiced a specialized or generalized subsistence strategy (e.g., Byers and Ugan 2005; Haynes and Hutson 2013; Waguespack and Surovell 2003). However, all agree there is evidence that makers of the Clovis point at least occasionally killed and processed mammoths, based on sites like Dent in Colorado (foothill-plains setting at 1,450 m asl) (Brunswig 2007) and Colby in Wyoming (intermontane basin locality at 1,240 m asl) (Frison and Todd 1986). They also, however, hunted pronghorn antelope and extinct forms of bison, as evidenced by the Sheaman site (a plains site in eastern Wyoming) (Frison and Stanford 1982).

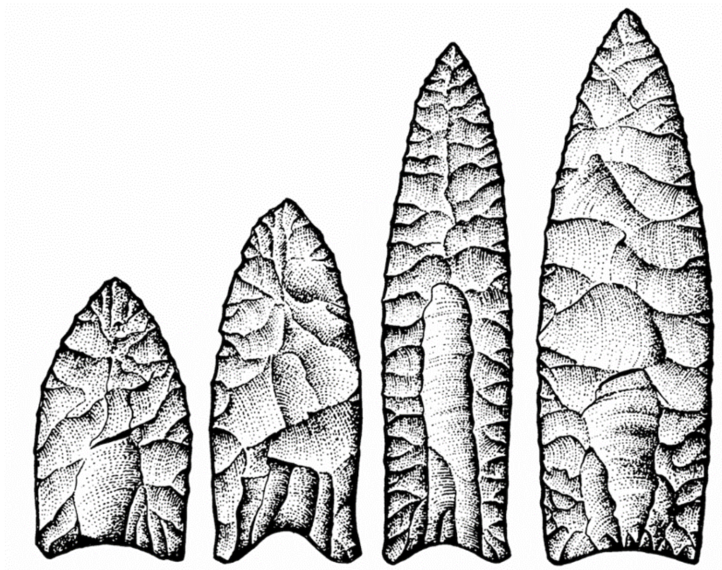


Figure 4.6. Sketches of Clovis projectile points (Courtesy George Bradford from Archeowiki site, under the sites license for public use. This is the case for Figures 4.6-14).

Archaeologists identify two symbolic behaviors that left clear archaeological signatures during the Clovis period: caches and burials. Caches occur disproportionately frequently in Clovis time, at sites such as the Crook County cache in northeastern Wyoming (in the Black Hills of Wyoming) (Huckell 2014) and the Fenn Cache in northern Utah (almost certainly from a mountainous setting, although its exact provenience is unknown) (Frison and Bradley 1999; Pitblado 2017). Gillespie (2007) characterized Clovis caches as symbolic, suggesting they were instrumental in the process of socializing Clovis landscapes because the act of burying the objects created place-markers on the landscape. There is also an example of a Clovis burial at the Anzick site in southwestern Montana (31 km east of the Bridger Mountains in the Shield River Valley at 1,520 m asl). Clovis people buried a baby boy at the site with grave goods of Clovis projectile points and preforms, ivory foreshafts, and ochre (Rasmussen et al. 2014; Wilke et al. 1991).

Following the Clovis archaeological culture in the Early Paleoindian Period is the archaeological complex associated with Goshen projectile points. Although archaeologists have previously equated it with the Plainview complex (common in the southern Plains) (Kornfeld et al. 2010), sites such as the Mill Iron site in southeastern Montana (a plains site) (Frison 1988) show that Goshen points pre-date the more southern Plainview projectile points by about 1,000 years. Evidence from the Mill Iron site and others indicate that people who made Goshen points hunted now-extinct bison. However, no evidence exists indicating any of their symbolic behaviors.

The final archaeological complex of the Early Paleoindian Period in the Rocky Mountains is the Folsom Complex. Associated with distinctive Folsom projectile points (Figure 4.7), such as those found at Indian Creek in Montana (a mountain site at 1,518 m asl), the people who made these points specialized in bison hunting on the Great Plains and in the Rocky Mountains (e.g., Agogino and Parrish 1971; Jodry 1999). However, bone tools, such as an elk-antler tools at the Agate Basin site (a plains site) (Walker 1982), show that they also could have hunted elk. In the case of Folsom archaeological culture, it may be that the projectile points themselves are evidence of symbolic actions. Researchers such as Bradley (1993) have suggested that the act of fluting the points may have been ritualistic in and of itself.

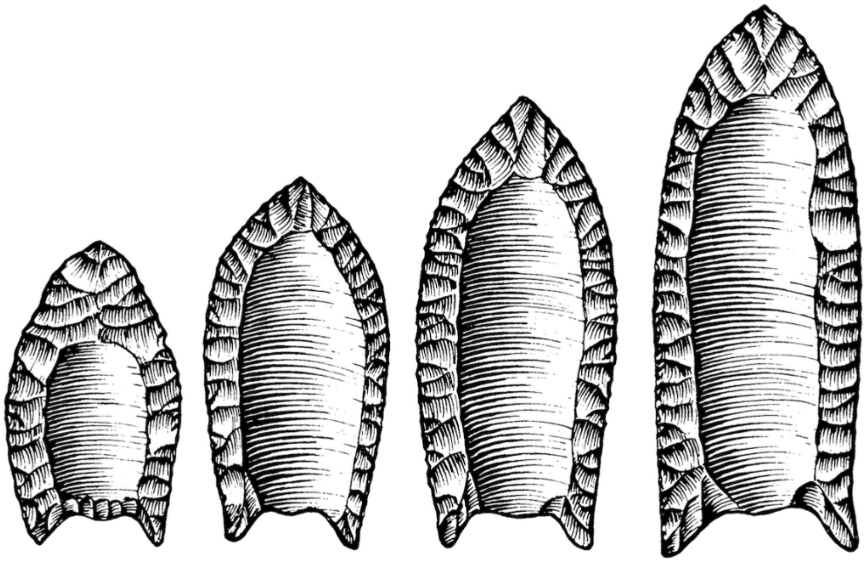


Figure 4.7. Sketches of Folsom projectile points. (Courtesy of George Bradford).

Middle Paleoindian Period (10,500 – 9,500 BP). The Middle Paleoindian Period is represented by three primary archaeological cultures and associated projectile points. People who made Agate Basin (Figure 4.8) and Hell Gap projectile points, relied heavily on bison as a staple resource, as revealed at on sites such as Carter/Kerr-McGee (a Plains site in the Powder River Basin of Wyoming) (Frison 1984). Similarly, the people of the Cody Complex, identified through point types such as Eden and Scottsbluff (Figure 4.9), were also specialized bison hunters (Knell and Muñiz 2013), which is the case at the Horner site (intermontane basin site at 1,469 m asl) (Frison and Todd 1987). These groups, however, left no evidence of their symbolic practices.

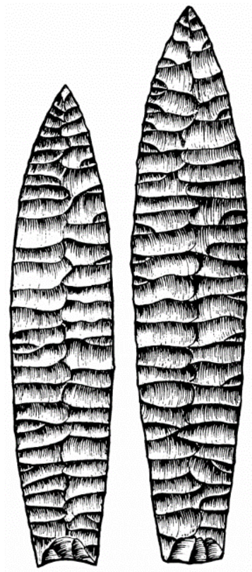


Figure 4.8. Sketches of Agate Basin projectile points. (Courtesy of George Bradford)

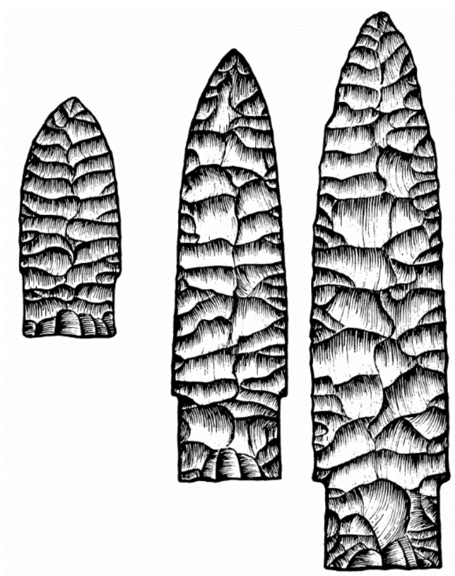


Figure 4.9. Sketches of Scottsbluff projectile points. (Courtesy of George Bradford)

Late Paleoindian Period (10,000 – 8,600 BP). When compared to the Early and Middle Paleoindian Period, the Late Paleoindian archaeological record shows an increase in the number of archaeological complexes and sites present in the Rocky Mountains. Specifically, George Frison (1992) described the “Foothill-Mountain

Complex" as a way of life, in which people lived in the mountains on a full-time basis and subsisted on broad-spectrum resources. The complex is represented by a variety of projectile point types, including Angostura (Pitblado 2003) (Figure 4.10) and Metzal points (Davis et al. 1988). Pitblado (2007) emphasized that the term "Foothill-Mountain Complex" refers to a lifeway and not a specific projectile point types, although some archaeologists have used it in the later sense. In contrast to the bison-focused complexes of the Great Plains, mountain-based people who practiced this lifeway used a more diversified set of resources. Evidence from sites such as the Lookingbill site in Wyoming (a montane site at 2,620 m asl) (Kornfeld et al. 2001) and the Barton Gulch site in southwestern Montana (Davis et al. 1988) suggest that people relied on as resources such as deer and whitebark pine. During the Late Paleoindian Period, there are few examples of symbolic behaviors.

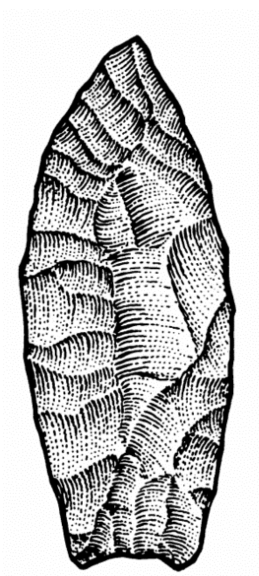


Figure 4.10. Sketch of Angostura projectile point. (Courtesy of George Bradford)

Archaic Period (8,600 – 1,350 BP)

The Archaic Period, encompassing most of the Holocene Epoch, is traditionally separated into three sub-periods: Early, Middle, and Late Archaic.

Early Archaic Period (8,600 – 5,000 BP). Of all time periods, the Early Archaic is the least understood throughout the Rocky Mountains due to its particularly scarce archaeological record. The depauperate record may reflect a decrease in population in the region at the time (Kelly et al. 2013). As a result, archaeologists have only documented a handful of meaningful projectile point types that they can associate with past lifeways and people (e.g., Hawken, Mummy Cave, and Oxbow point types) (Figure 4.11) (Kornfeld et al. 2010; Peck 2011).

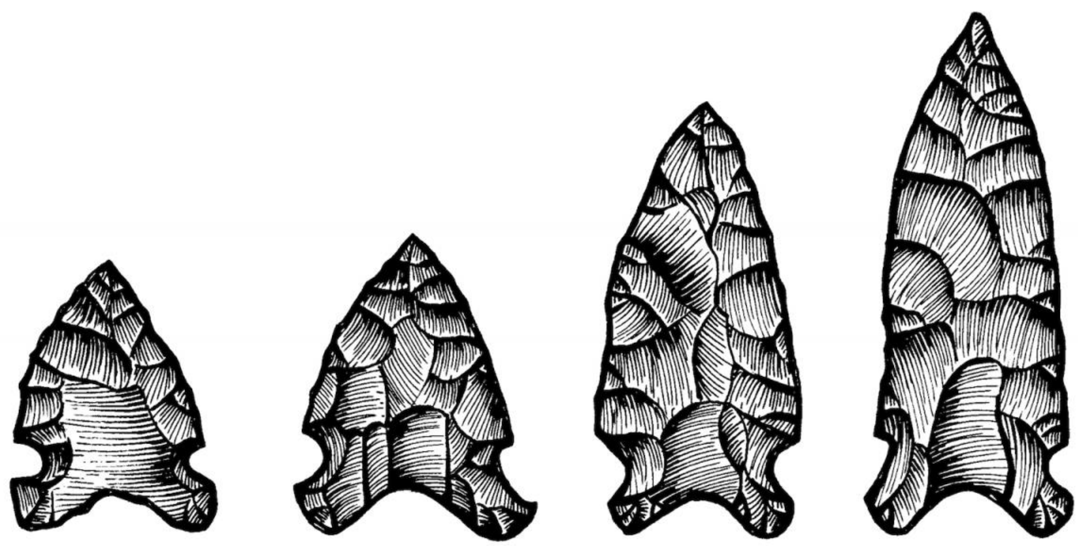


Figure 4.11. Sketches of Oxbow projectile points (Courtesy of George Bradford)

Based on evidence from sites like Lookingbill and Mummy Cave (at 1,920 m asl) sites in northwestern Wyoming and the Hawken site in northeast Wyoming, people in this period, like those in the Late Paleoindian Period, relied on a diverse set of resources, as evidenced by the types of faunal remains present at sites and an increased presence of groundstone implements. People also hunted bison where the terrain allowed, using primarily arroyo traps and processing the remains away from kill sites (e.g., Frison et al. 1976). In other areas, people targeted deer, bighorn sheep, and whitebark pine nuts (Husted and Edgar 2002; Kornfeld et al. 2001). Currently, there is no evidence for symbolic activity in the Early Archaic Period.

Middle Archaic Period (5,000 – 3,600 BP). Archaeologists working in the northern Rocky Mountains and Great Plains recognize two complexes dating to the Middle Archaic Period: the previously mentioned Oxbow complex, and its associated Oxbow projectile points, extends from the late Early Archaic into the Middle Archaic Period; and the McKean Complex. Associated with McKean, Duncan, and Hanna projectile points (Figure 4.12), sites, such as Dead Indian Creek site in northern Wyoming (in a mountain setting), show that people used diverse resources, including plants (based on an increase of groundstone artifacts) (Kornfeld et al. 2010), mule deer, and bighorn sheep (Frison and Walker 1984; Simpson 1984). Archaeologists also uncovered a pithouse at the site (Kornfeld et al. 2010). One of the few examples of symbolic actions recognized from the Middle Archaic Period is ceremonial caching. At the Yearling Spring site, Carpenter and Fisher (2014) found a cache of obsidian bifaces buried with ochre near Livingston, Montana (a montane site at 1,403 m asl) roughly 30 km east of the Bridger Mountains), with dates that correspond to the end of the Middle Archaic.

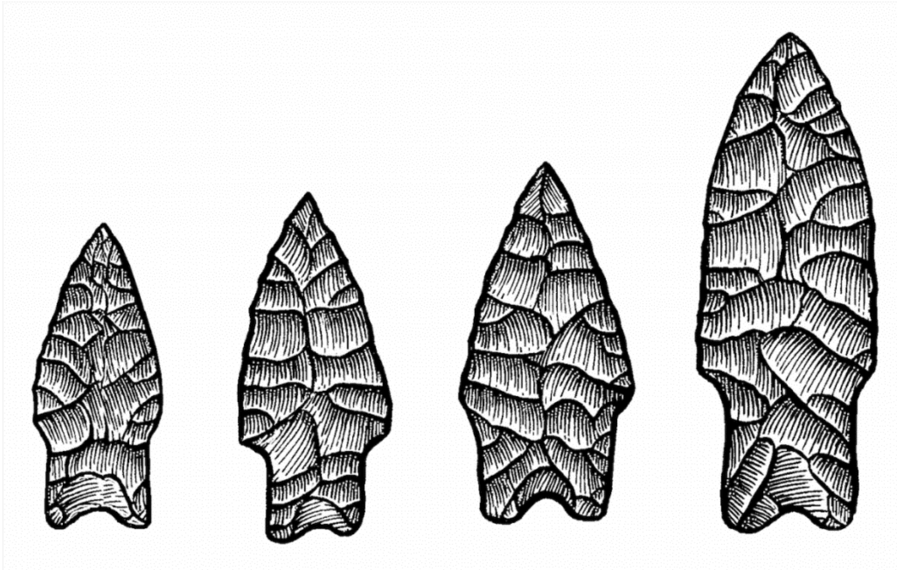


Figure 4.12. Sketches of Duncan projectile points. (Courtesy of George Bradford)

Late Archaic Period (3,600 – 1,350 BP). Kelly and his colleagues (2013) showed that the human population during the Late Archaic Period was the highest it ever was in the Rocky Mountains, because the climate had cooled down after the Altithermal and populations increased. Within this period in the northern Rocky Mountains, archaeologists recognize two archaeological cultures, associated with two distinctly different projectile point types: Pelican Lake (3,600 – 2,000 BP) (Figure 4.13) and Besant (2,000 – 1,350 BP) (Figure 4.14). The people who were a part of the Pelican Lake archaeological culture frequently hunted bison, as evidenced by Head-Smashed-In Buffalo Jump in Alberta (in a foothill-plains setting at 1,010 m asl) (Reeves 1978). The people of the Besant archaeological culture also hunted bison, sometimes using corrals to trap the animals, such as at the Muddy Creek site in Wyoming (Hughes 1981). Archaeologists have also found digging sticks at rock shelter sites from this period, suggesting that the people who made Besant projectile points also targeted tubers, including sego lily and wild onion (Kornfeld et al. 2010).

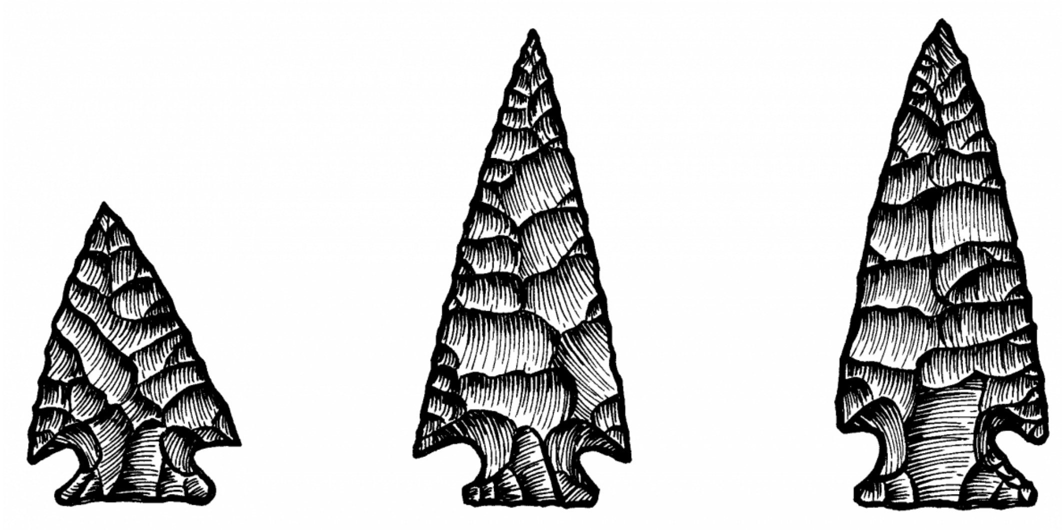


Figure 4.13. Sketches of Pelican Lake projectile points. (Courtesy of George Bradford)

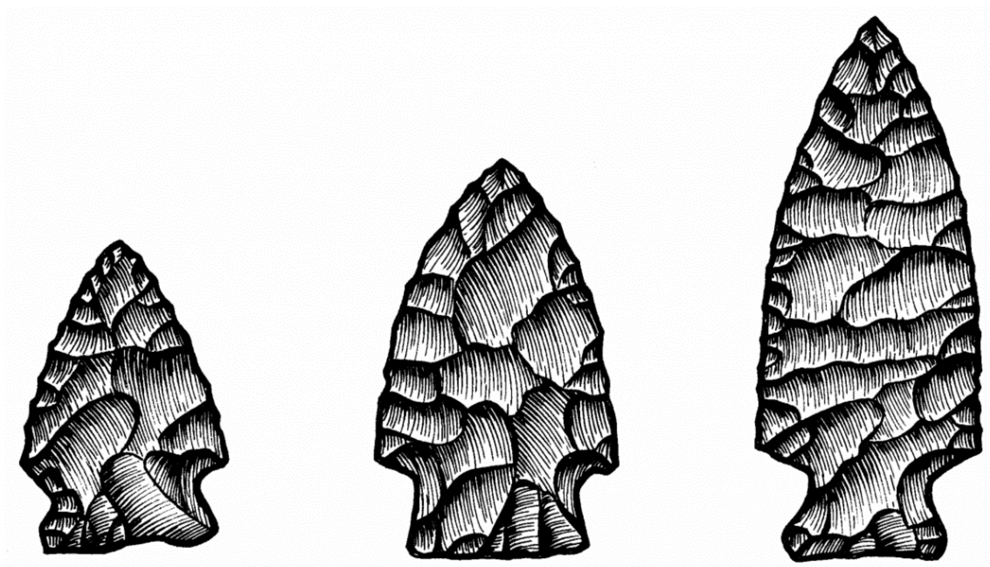


Figure 4.14. Sketches of Besant projectile points. (Courtesy of George Bradford)

Archaeologists have identified a diverse set of symbolic behaviors dating to the Late Archaic Period. People created medicine wheels, such as the Bighorn Medicine Wheel in Wyoming (a mountain site at 2,942 m asl), which have been interpreted variably as astronomical markers, memorials, or burial locations (Brace 2005; Mirau 1995). Cremations, such as a Pelican Lake cremation in Wyoming, suggest a change in burial practices during the Late Archaic (Frison and Van Norman 1985). The people living during this period also created more rock art than before (Keyser and Klassen 2001).

Late Pre-Contact Period (1,350 – 200 BP)

By 1,350 BP the human population in the Rocky Mountains reached its maximum and begun to drop off. Kelly and his colleagues (2013) attributed this to the effects of the Little Ice Age throughout most of the region. Bow-and-arrow technology had also arrived in the northern Rocky Mountains at the beginning of the Late Pre-Contact, marked by the appearance of projectile point types such as Avonlea and, later, Old Woman's Phase (ancestral Blackfoot), Cottonwood Triangular, and tri-notched points (Kornfeld et al. 2010). Although arriving in the area at different times, by the end of this period, Kootenai, Apsalooké, Shoshone, and Blackfoot people were well established in the region (Byers et al. 2003; Janetski 2002). Archaeological evidence shows an intensification of communal bison hunting, such as at the Avonlea and Old Woman's Phase components of the Antonsen site, located at 1,460 m asl in the Gallatin Valley and about 35 km west of the Bridger Mountains (Davis and Zeier 1978). This intensification is also evident in the extensive drive-line systems built during this period, which Zedeño and her colleagues (2014) associate with increasingly complex social organization among ancestral Blackfoot people, given the amount of labor needed to construct them. Other sites, such as the Avonlea site of Lost Terrace in central Montana (a Plains site) (Davis et al. 2000), show evidence of pronghorn antelope processing.

In addition to the drive lines (Zedeño et al. 2014), archaeologists have recognized three archaeological signatures of symbolic practices in this period. First, the ancestors of Blackfoot people continued to construct medicine wheels as mortuary structures (Mirau 1995). Second, several burials with grave goods date to this period, including that of a Shoshone man from Mummy Cave in the Wyoming foothills (Husted and Edgar 2002). Finally, Late Pre-Contact people also continued to create rock art, such as the Foothills Abstract and Eastern Columbia Plateau images from the Gates of the Mountains site in west-central Montana (in a foothills setting) (Scott et al. 2005) and the Dinwoody tradition at Legend Rock in Wyoming, associated with the ancestors of Shoshone people (Francis and Loendorf 2004) (Figure 4.15).

Figure 4.15. A picture of Dinwoody tradition petroglyphs from Legend Rock, Wyoming. (Photo by Meghan Dudley)

History of Archaeological Research in the Bridger Mountains

The Bridger Mountains, like the Rocky Mountains in general, received little systematic archaeological attention until the late twentieth century. Prior to the 1990s, archaeologists had only published on two sites from the mountain range: Blacktail Cave

(24GA301) and Flathead Pass (24GA303). In the late 1950s, Francis Niven (1959) and Lewis Kyle Napton (1966) separately investigated Blacktail Cave, a Late Pre-Contact rock art site (Figure 4.16). Niven (1959) and Napton (1966) reported that the site consists of two caves containing hematite pictographs that depict anthropomorphic figures. The few artifacts found during these early test excavations included trade beads and flakes (Napton 1966). Importantly, other archaeologists who visited the site and studied the iconography of the pictographs have suggested that some of them may date to the Late Archaic Period (e.g., Allen 1989; Greer and Greer 1996).

Figure 4.16. Blacktail Mountain, the northern-most peak of the Bridger Mountains (indicated by a red arrow), where Blacktail Cave is located. Because the land in the front of the mountain is privately owned, access to the site is difficult. (Courtesy of Mike Cline)

The other site in the Bridger Mountains mentioned in the early publications is Flathead Pass (24GA0303) (Figures 4.17-18). Napton (1966), who described the site in his master’s thesis, was the first researcher to discuss a high-elevation site in the mountain range (2,130 m asl). Although early surveys resulted in the recovery of few artifacts, Napton expressed interest Flathead Pass based on both the site’s high elevation and its location as a travel corridor between the Gallatin and Shields River Valleys, where large herds of bison were known to graze.

Figure 4.17. The Flathead Pass site (24GA0303), looking north. (Photo by Meghan Dudley)

Figure 4.18. Flathead Pass site, looking east across the Shields River Valley and the Crazy Mountains. (Photo by Meghan Dudley)

Between the completion of Napton's (1966) thesis and the 1990s, the Gallatin National Forest Service conducted the only archaeological work in the Bridger Mountains as a result of the National Historic Preservation Act (NHPA) (1966). In all, archaeologists wrote 84 reports between 1975 and 2016 based on surveys conducted, in response to timber sales and construction projects in the mountains, recording 83 sites.

Only in the 1990s did the first large-scale, systematic surveys of Bridger Mountains take place. Beginning in 1993 and continuing in 1997, Jack Fisher (Montana State University) and Walter Allen (Gallatin National Forest), assisted by avocational archaeologist Bob Donahoe, organized pedestrian surveys and test excavations on the western slopes of the mountains. Their efforts were focused on this half of the mountains, due to both restraints in public access (i.e., there are a number of private lands that abut against the public Forest Service at the base of the Bridger Mountains) and prior knowledge from informal surveys conducted by Donahoe. They produced two Forest Service reports of their work and the only publicly accessible publication to focus exclusively on the Bridger Mountains (Byers et al. 2003).

Byers and his colleagues (2003) suggested that people used the mountains continuously from the Paleoindian through the Late Pre-Contact Periods, an inference based largely on projectile points recovered in the study area. Notably, most of the projectile points recovered date to the Archaic Period. Using Binford's (1980) forager-collector spectrum, Byers et al. (2003) hypothesized that the hunter-gatherers who made those points used the Bridger Mountains as a resource patch from bases on the floor of the Gallatin Valley, to target resources such as mule deer and whitebark pine nuts. The resulting sites people created were largely secondary, logistical camps, with some specialized task sites such as the Bridger Silicified Siltstone quarry. Oral traditions of Apsalooké people indicate that they visited Fairy Lake on the eastern slopes of the Bridger Mountains to gather medicinal plants (Byers et al. 2003). Although there is local lithic raw material available, the Bridger Silicified Siltstone does not appear to be a prime motivation for mountain visits because people only used the material locally and to make expedient tools. Byers and his colleagues (2003) also noted the importance of travel corridors at Flathead Pass, Sacagawea Peak, and Ross Pass (see Figures 4.2-3), which allowed people and animals to cross the mountains. In fact, they cited documentation from Lewis and Clark of a bison trail crossing Flathead Pass. When combining that information with the knowledge of sites in the pass, it reinforces the idea that Pre-Contact groups regularly traveled across the mountains between the Shields River and Gallatin Valleys. Although the authors offer other potential explanations as to why people may have visited the mountains, including a "backyard effect" (i.e., a recreational escape from valley life, similar to my recreational landscape type) (Byers et al. 2003: 160), they felt confident emphasizing the resource role of the Bridger Mountains based on the data available to them at the time.

After the publication of Byers et al. (2003), Fisher, Allen, and Donahoe continued doing fieldwork in the Bridger Mountains until 2005. Their work resulted in the collection of more than 6,000 artifacts from the western slopes of the mountains at 96 locations (46 sites and 49 isolated finds), all currently housed at Montana State University. In addition, Donahoe conducted his own pedestrian surveys, beginning in the late twentieth and continuing into the twenty-first centuries. These surveys covered a large portion of the western slopes of the mountains (Figure 4.19). His observations support earlier observations that the majority of sites occur between Flathead and Ross Passes (Bob Donahoe, personal communication, 2015).

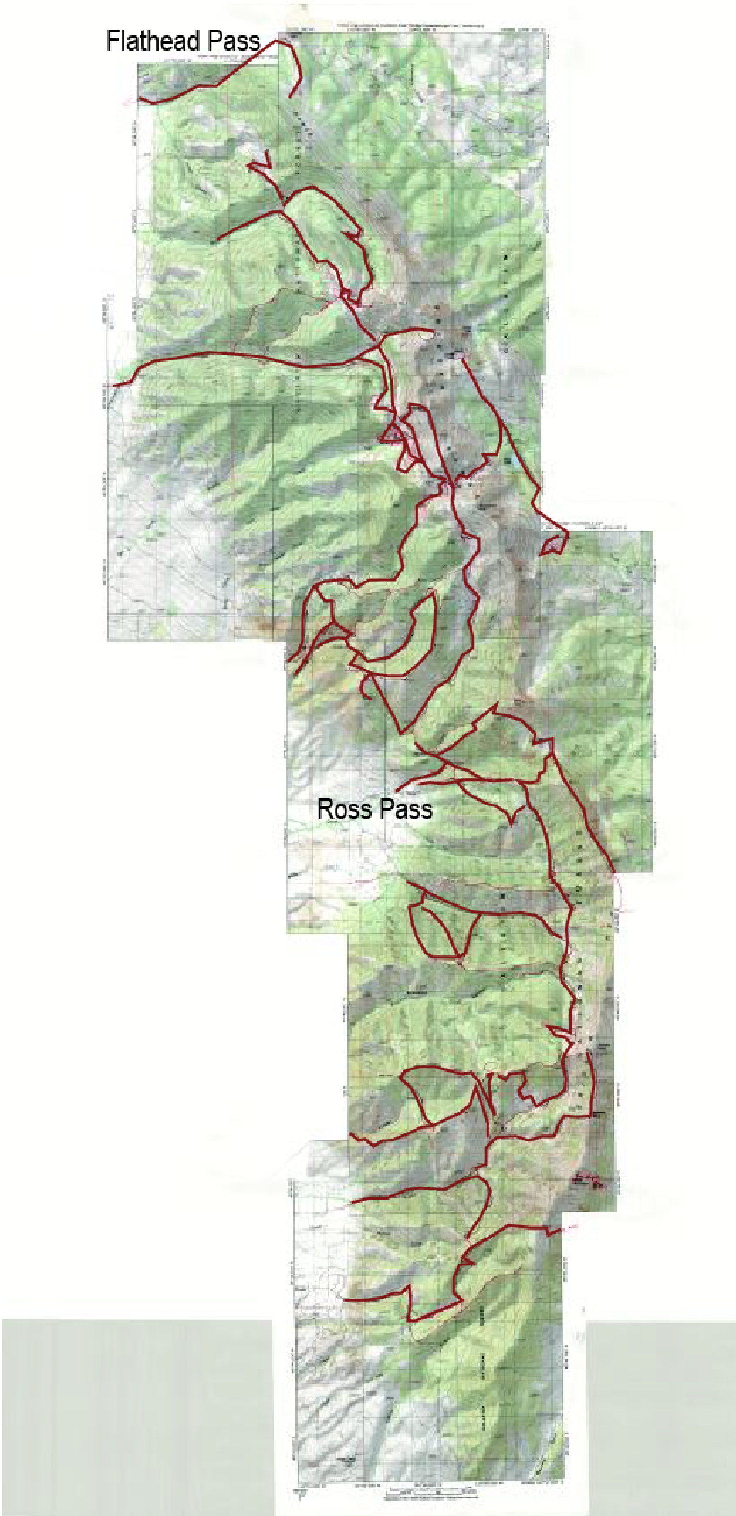


Figure 4.19. Map created by Donahoe, recording areas he has surveyed, with Flathead and Ross Passes labeled. Red lines on the topographic map denote surveyed areas. (Courtesy of Bob Donahoe)

More recently, two additional studies have shed additional light on the Pre-Contact periods of the Bridger Mountains. Michael Neeley and Amy Denton (2012) presented a paper at the 2012 Montana Archaeological Society conference, reporting the results of test excavations at the Wright Site. Located at the base of the mountains near Ross Pass at 1,537 m asl, Neeley and Denton (2014) described the site as a large base camp. Interestingly, however, despite the range of tool types and raw materials they documented, they did not recover artifacts made from the local Bridger Silicified Siltstone. Given the site's proximity to the mountains, this absence is surprising and could indicate that perhaps people did not frequently bring the material down from the mountain, instead using it on an as-needed basis.

In 2015, Fisher, Donahoe, and I geochemically sourced 34 chronologically diagnostic projectile points made of obsidian and dacite from the mountains. Our results indicate that during the Paleoindian and Early to Middle Archaic Periods people obtained raw materials from relatively nearby sources – within 100 km from the Bridger Mountains – such as Obsidian Cliff in Yellowstone and the Cashman dacite quarry 78 km to the southwest of the Bridger Mountains. In contrast, people during the Late Archaic and Late Pre-Contact Periods used similar resources as well as those sourcing to quarries farther away, such as the Timber Butte obsidian quarry in Idaho (ca. 200 km to the west). Although these results speak to the larger socialized landscape in which Late Pre-Contact groups lived (beyond the scope of this thesis, confined to the Bridger Mountains themselves), they do provide a context of social networks and mobility patterns for the Bridger Mountains in the past.

Summary

To date, archaeologists have learned a lot about the paleoenvironment and archaeology of the Bridger Mountains. The mountains experienced four major climatic changes, each impacting ecozones and plant distributions in the mountains. The culture history of regions adjacent to Bridger Mountains shows evidence for early and late Paleoindian occupations, followed by a decrease in sites during the Early Archaic period and a steady increase of sites in Middle Archaic and Late Archaic. During the Late Pre-Contact period the ancestors of Shoshone, Blackfoot, Apsalooké, and Kootenai people dwelt in the region. Research conducted in the late 20th and early 21st centuries demonstrated that the people who occupied the Bridger Mountains practiced a collector landscape-use strategy, establishing residential base camps at the foot of the mountains on the valley floor and field camps in the mountains (Binford 1980; Byers et al. 2003). In the mountains, people throughout time likely targeted mule deer and whitebark pine nuts, among many other resources. They also heat-treated the local Bridger Silicified Siltstone material to make expedient tools while in the mountains. Pre-Contact groups also used several travel corridors through the mountains at Flathead Pass and near Sacagawea Peak and Ross Pass. These data set the stage to probe the archaeological record in the Bridger Mountains for evidence of how people in the past socialized their landscape.

Chapter 5: Pilot Study Methods

To investigate the socialized landscapes of the Bridger Mountains, I used the data from artifacts found on the western slopes during the 1990s and 2000s fieldwork conducted by Jack Fisher, Walter Allen, and Bob Donahoe. I decided to work with this collection for two reasons. First, their work represents the most systematic studies conducted to date in the mountain range. Second, the collection only covers the western slopes of the Bridger Mountains, allowing me to conduct all the necessary analyses within the scope of a master's thesis.

After completing fieldwork, Fisher oversaw the analysis of the collected lithic artifacts conducted by avocational archaeologist Bob Donahoe and undergraduates at Montana State University (MSU) between 2005 and 2007. Each analyst used coding sheets designed by lithicist Tom Roll (MSU) and Jack Fisher, which they developed for use at other sites such as Ulm Pishkun in Montana. Donahoe and MSU students cataloged and analyzed a total of 6,318 lithic artifacts and entered these data in a Microsoft Access database maintained by Fisher. Although Donahoe and students identified artifacts as projectile points in the database, they did not assign specific types to them.

To determine what types of socialized landscapes may have been created by past people in the Bridger Mountains, I typed projectile points in the collection to establish chronological control for the sites and used Fisher's database to analyze two components of the collection: the artifact assemblages and locational and geographic data of the dated sites. In the remainder of this chapter, I describe the projectile point typology used to relatively date sites and then describe of the specific analyses I used to attempt to determine which types of socialized landscapes are represented in the archaeological record of the Bridger Mountains.

Dating Sites in the Bridger Mountains

With few exceptions (e.g., Pitblado 2003, 2007), typologies used in Rocky Mountain settings are borrowed from those developed for adjacent areas, such as the Great Plains, Great Basin, and Southwest. In the northern Rocky Mountains, southwestern Montana is no different. Archaeologists working in the region, including in the Bridger Mountains, have cobbled together a typology largely from Canadian Northern Plains types, together with types from Wyoming and the Great Plains (e.g., Davis and Keyser 1999; Kehoe 1966; Kooyman 2000; Kornfeld et al. 2010; Peck 2011; Peck and Ives 2001; Reeves 1983). To this typology, I also add Pitblado's (2003, 2007) Late Paleoindian types of Angostura and Jimmy Allen.

Using this typology, I typed the projectile points from the Bridger Mountains using both macroscopic observations and measurements I took, based on Tom Roll and Fisher's coding guides (see Appendix B). I opted to use their coding sheet so that the measurements I took for each point would be comparable to the original database. Projectile points that did not include enough diagnostic elements to confidently assign a particular type were not included in my study, nor did I include points that lacked detailed proveniences. After completing the measurements, I assigned a type based on the measurements and qualitative characteristics. For points that did not have clear visual characteristics of any type, I relied solely on the measurements I collected from each point to assign a type based on existing typologies. For some points, such as those that were potentially Paleoindian in age, I sought input from Bonnie Pitblado. I then entered the assigned type in a separate database from the original Bridger Mountain database created by Fisher.

Analyses Conducted

I used the four forms of analysis described in Chapter 3 to aid in determining which types of socialized landscapes people created in the Bridger Mountains. Three of the four analyses focused on evidence left behind by past *espaces*, while the fourth targeted *tours*.

Espace *Analyses*

Because *espaces* leave behind a material footprint of their creation, I used them to identify the types of practices occurring there, which ultimately reflect the type of socialized landscape on which they occur. With that in mind, I selected three analyses to assess the factors that brought people to the mountains: determining site function, site location selection, and viewshed analysis.

Site Function. As mentioned in Chapter 4, David Byers and his colleagues (2003) determined that sites in the Bridger Mountains were secondary, logistical camps created by collectors when they visited the mountains to procure seasonally available resources. However, they made their initial interpretation using data collected in the 1990s, when they had fewer sites, fewer artifacts, and no dates for individual sites to understand what and when groups may have occupied the site.

To assign function to sites in my dataset, I used the analyzed lithic tools from Fisher's 2007 database. Donahoe and undergraduate students analyzed the site assemblages using Roll's and Fisher's coding guide (Appendix B). In their analyses, they differentiated among 18 lithic tool types, such as bifaces, cores, and unifaces (for a full list of artifact types, see Appendix B). Different types of debitage, such as utilized flake, flakes, and angular debris, were coded separately from tool types.

Because they identified so many discrete tool types, I calculated the evenness index for tool types for each site, instead of performing traditional assemblage analyses to determine site function. Originally developed by Pielou (1966) to assess ecological diversity, James Chatters (1987) repurposed it for archaeology by combining the evenness index from ecology with expectations from Binford's (1980) forager-collector spectrum to quantify tool diversity at sites in the Columbia Plateau. As with the Bridger Mountains, Chatters already understood the types of sites within the spectrum as either specialized task camps or generalized residential camps. He applied the evenness index to the site assemblages to understand how diversified the site tool types were, in hopes of inferring whether sites represented residential or specialized task camps.

Inspired by James Chatters's (1987) application of the index with sites on the Columbia Plateau, I used this approach because it allowed me to 1) assess the high number of tool types identified in the previous analyses and 2) compare tool type diversity easily across multiple sites by quantifying that diversity on a single scale. I calculated the evenness index using the following equation (Chatters 1987), where N_i is the proportion of artifacts for a specific type within the site assemblage, N is the total number of artifacts in the assemblage, and S is the number types in the assemblage:

$$\frac{\left(\frac{N_i}{N}\right) log \left(\frac{N_i}{N}\right)}{log\ s} = E$$

The diversity of object types is quantified with scores ranging from 0.0 to 1.0. Scores of 0 represent a single type of object present and, thus, low diversity; scores of 1 represent a wide variety of object types and, as a result, high tool-type diversity at a site. Although Chatters (1987) noted that this index is sensitive to sample size, he chose to use it because he reinforced his results with other datasets, such as faunal remains. His results indicated that sites previously identified as hunting camps had evenness index values between 0.76-0.84 whereas sites identified as spring or generalized campsites had values that ranged between 0.87 and 0.93.

I followed Chatters's (1987) approach and calculated the evenness index to the dated site assemblages in the Bridger Mountains, knowing that sites had largely been previously identified as secondary or logistical campsites within the forager-collector spectrum. In contrast to Chatters's varying assemblage sizes, the site assemblages in the Bridger Mountains are similar in size for the most part, and, I therefore felt comfortable using the index in the absence of additional lines of evidence, such as faunal data. Just as Chatters identified ranges for his specialized and generalized camps, I plotted those calculated evenness index scores in a histogram and identified each mode created in the histogram as a different site type. Modes closer to 1 represented secondary, logistical campsites, and I associated those sites with ranges closer to 0 with specialized task sites.

Site Location Selection. Evaluating site location relative to climate and temporal changes can help identify *espaces* as place-markers on a symbolic landscape, because I expect such *espaces* have been continually created and maintained in the same spatial location despite changes in climate over time. Using Benes's (2016) paleoenvironmental model of the Bridger Mountains, I compared site locations by time period against Benes's inferred environments and resources. If sites remained in the same location despite climate changes, then I considered it likely that people selected the site location for reasons other than adjacent resources. These reasons could include social memory or other factors related to place-markers on a symbolic socialized landscape. If sites varied by time period along with changes in the environment, then I argue the *espaces* are likely tied to a resource-socialized landscape. I present my findings as maps showing site locations and tables which summarize the elevations of each site and resources that people could have used during a given time period.

Viewshed Analysis. To determine if people selected site locations so they could see specific place-markers across the landscape in and around the Bridger Mountains, I conducted a viewshed analysis in ArcGIS (v. 10.4.1). For each site with a diagnostic projectile point, I ran the visibility tool, with a 1.5 m observer offset from the ground to account for a viewer's height. I then compared each of the site's viewsheds by time period, to determine if any of the viewsheds overlapped in a certain location within the Bridger Mountains. Following the suggestions of Bernardini et al. (2013), I was particularly interested in determining if any of the mountain peaks of the Bridger Mountains were repeatedly visible from the sites. If site viewsheds overlapped on a specific feature by time period, then I concluded that the specific feature may have been a place-marker in the past on a symbolic landscape. If no viewsheds overlapped, this result suggests that, if place-markers did exist in a given time period, people did not choose site locations to view them. I report these results both as maps showing the viewsheds from the sites and tables that list which geographic features were visible from each site by time period.

Tour *Analysis*

As discussed in Chapter 3, people can create one of two types of *tours*: efficient or non-efficient *tours*. Based on my archaeological expectations (Table 3.1), each type contributes to our understanding of which socialized landscape people created. To determine which occur in the Bridger Mountains, I followed the example of Devin White and Sarah Barber (2012) and created a "From Everywhere to Everywhere" (FETE) least-cost path model against which I compared site locations in the Bridger Mountains. Unlike most least-cost analyses which map efficient routes from a single point to another location or a single point to multiple locations, the FETE analysis models all of the potential least-cost paths from every point on a grid overlaying the terrain to every other point on that same grid (White and Barber 2012). These points do not represent archaeological sites, but, rather, are random points meant to capture all potential efficient routes across a landscape. The analyst can then compare the modeled paths against archaeological site locations to determine whether or not people in the past used such hypothetical trails.

I conducted a FETE least-cost path analysis against which I compared archaeological site locations in the Bridger Mountains. I diverged from their approach only in the creation of random points. Instead of using a grid to establish these points, I used ArcGIS's tool "Create Random Points" as I would for a Monte Carlo analysis to generate 100 random points. A Monte Carlo analysis creates a model for comparison against real-world datasets by running an analysis with randomly generated points. I used this approach because those random points mimic a random pattern of site distribution and should, as a result, capture most of the potentially efficient routes through and across the Bridger Mountains.

To create the least-cost path model, I first, using a 10 m DEM of the Bridger Mountains, generated 100 random points in ArcGIS. After creating the necessary layers to conduct a least-cost path analysis, I then created a model using ArcGIS's model builder to calculate the all-point to all-point isotropic (or one-way resistance) least-cost paths between the 100 random points (Figure 5.1). I did not add extra friction costs apart from slope because controlling for vegetation over the whole range and valley floor was not possible and because the streams in the mountains rarely present a significant challenge to cross. Once I completed the model, I overlaid the site locations by time period onto it and compared their locations to the least-cost paths. If sites were located along the modeled routes, I determined that the *tours* present were efficient ones. If the sites occurred away from the hypothetical paths, I concluded that people did not use the most efficient routes between *espaces*.

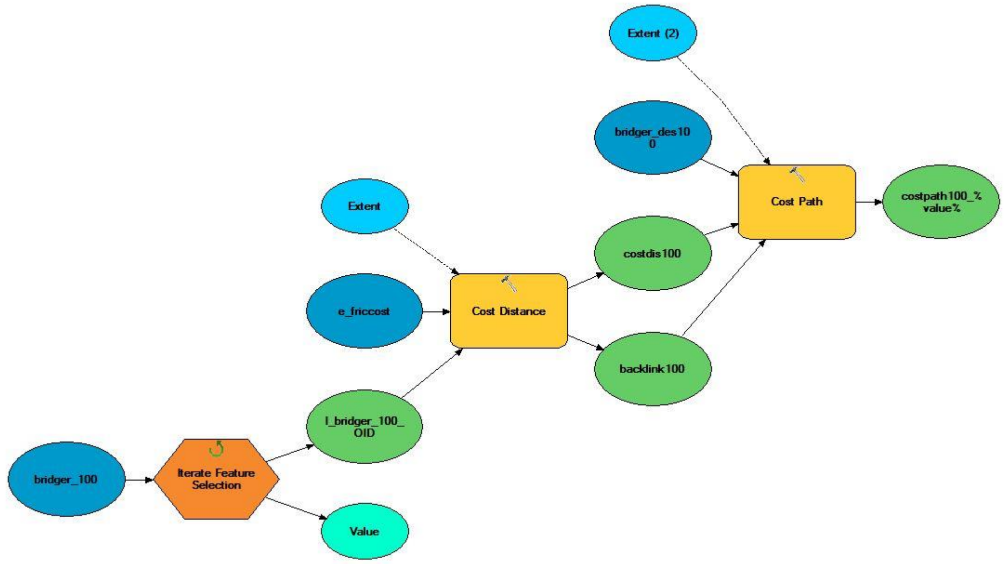


Figure 5.1. Model created in ArcGIS to perform the FETE least-cost path analysis to identify past *tours*.

Summary

Before conducting analyses to identify socialized landscapes in the Bridger Mountains, I first relatively dated the sites in my database through projectile point cross-dates, compiled by those who work in the region from typologies created for the Canadian Plains, Great Plains in the United States, and the Southern Rocky Mountains. Once I identified the dated sites, I used four forms of analysis to aid in the identification of specific types of socialized landscapes in the Bridger Mountains: determining site function through the evenness index, identifying site location selections relative to the contemporary climate, a viewshed analysis, and a FETE least-cost path analysis. I conducted the analyses by time period (Paleoindian, Early and Middle Archaic, Late Archaic, and Late Pre-Contact) to account for potential cultural differences over time. I present these results by time period in the following chapter.

Chapter 6: Results

Here, I first present the results of typing projectile points from the Bridger Mountains to relatively date the sites in my database as well as the establishment of the site type ranges by evenness index. I then describe the results of my four analyses by time period to identify types of socialized landscapes in the Bridger Mountains.

Projectile Point Typologies and Dating of Sites

A review of the lithic artifacts determined that Fisher's, Allen's, and Donahoe's fieldwork identified 138 projectile points in the Bridger Mountains (compared to the 176 reportedly in the database). I believe the discrepancy in sample size is due to the inclusion in Fisher's database of several distal, bifacial fragments from hafted bifaces and some tools I identified as preforms or knives, as opposed to diagnostic projectile points. Of the 138 points, I typed 88 of them from archaeological sites (for all type assignments, see Appendix C). I excluded the remaining points because they either represented isolated finds, which I did not consider in the analysis, or because the projectile points lacked enough diagnostic elements to identify the specific type. Ranging from Early Paleoindian to Late Pre-Contact, the 88 specimens represent 15 sites in the Bridger Mountains (Figure 6.1, Table 6.1).

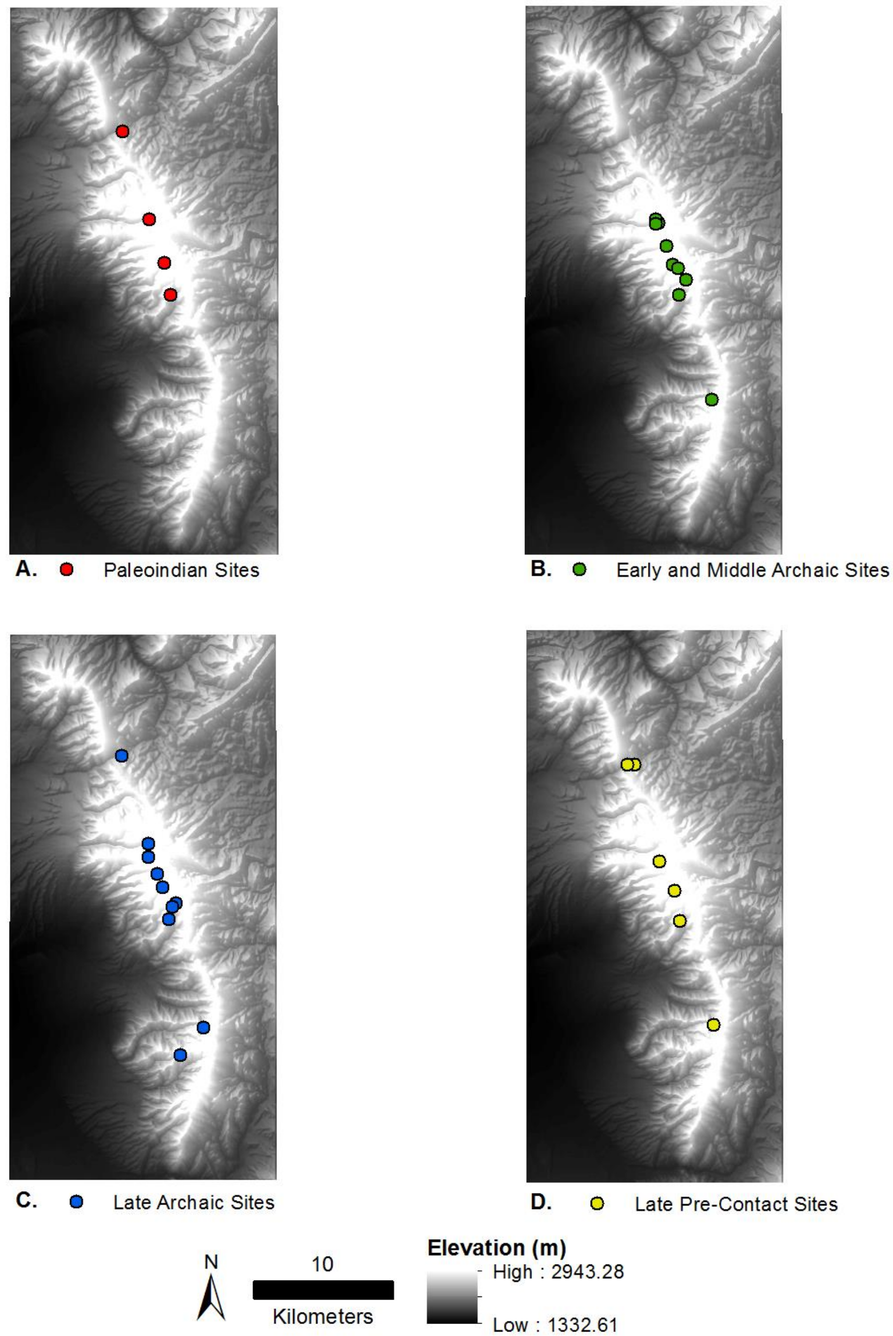


Figure 6.1. Location of sites by time period, based on projectile point typologies.

Table 6.1. Number of dated sites and projectile points by time period. As expected, the bulk of projectile points date to one of the three divisions of the Archaic Period.

Time Period	No. of Sites	No. of Points	% of Total Points Typed
Early Paleoindian	1	1	1%
Late Paleoindian	3	3	3%
Early Archaic	1	1	1%
Middle Archaic	9	15	17%
Late Archaic	10	55	63%
Late Pre-Contact	6	13	15%
Total	15	88	100%

These 15 relatively dated sites constitute the assemblage I analyzed to identify socialized landscapes in the Bridger Mountains (to understand these sites within the context of the all the sites in the mountains in Fisher's database, see Appendix E). I divided the time frames into a general Paleoindian Period, the Early and Middle Archaic, the Late Archaic, and the Late Pre-Contact Period, to ensure the largest possible sample sizes for each time frame. Because I typed most projectile points (n = 55) to the Late Archaic Period, I can speak more confidently about these results than for other periods and felt that it merited its own discussion. However, despite small numbers of projectile points and, thus, sites for some time periods, I continued the analyses for all periods, with the caveat that the sample sizes are small and the results, therefore, preliminary.

Site Types and the Evenness Index Scores

To determine site functions at the 15 sites from the 18 lithic tool types that Donahoe and MSU students identified, I used the evenness index, as described in Chapter 5. I calculated the evenness index scores for each of the 15 sites and plotted them in a histogram to identify the number of modes, and, thus, site types, that are represented by my database of the Bridger Mountain dated sites (Figure 6.2). The histogram shows two modes in the data. Because Byers and his colleagues (2003) had already interpreted sites in the Bridger Mountains as secondary, logistical campsites in the mountains on Binford's (1980) forager-collector spectrum, I suggest that the larger mode, with scores ranging from 0.7 to 1, are sites with an even distribution of lithic tool types present and that are these secondary campsites identified by Byers et al. (2003). I interpret the smaller mode, ranging from 0.55 to 0.6, as a second type of site with an uneven distribution of types of lithic tools present, indicative of a specialized task site. I used the ranges then to identify site function of individual sites in the Bridger Mountains by time period.

In doing so, however, I wish to emphasize the likelihood that specific site functions have been blurred into two types because of the lack of chronological control over the site assemblages as a whole. Although I can date the surface lithic scatters roughly using projectile point typologies, I cannot determine which tool types are associated with the projectile points. As a result, any determination of site function is a coarse-grained one, where specific actions from different time periods may have been mixed together. The resulting identifications should be viewed cautiously.

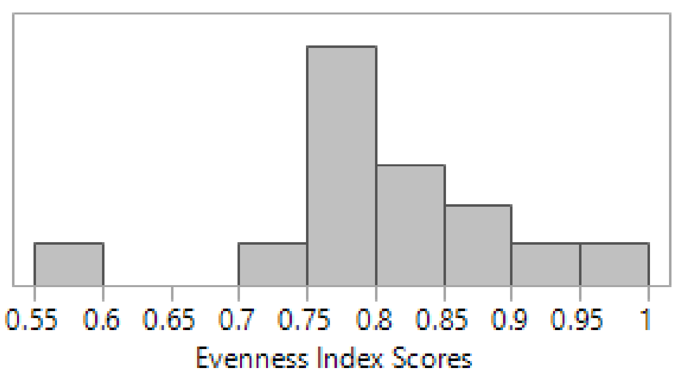


Figure 6.2. A histogram of the evenness index scores for sites in the Bridger Mountains, based on lithic tool types in their assemblages.

Paleoindian Period

Based on the presence of Early and Late Paleoindian projectile points at four sites, I used four locations as the basis for my *espace* and *tour* analyses for the Paleoindian Period (Figure 6.3 and Table 6.2).

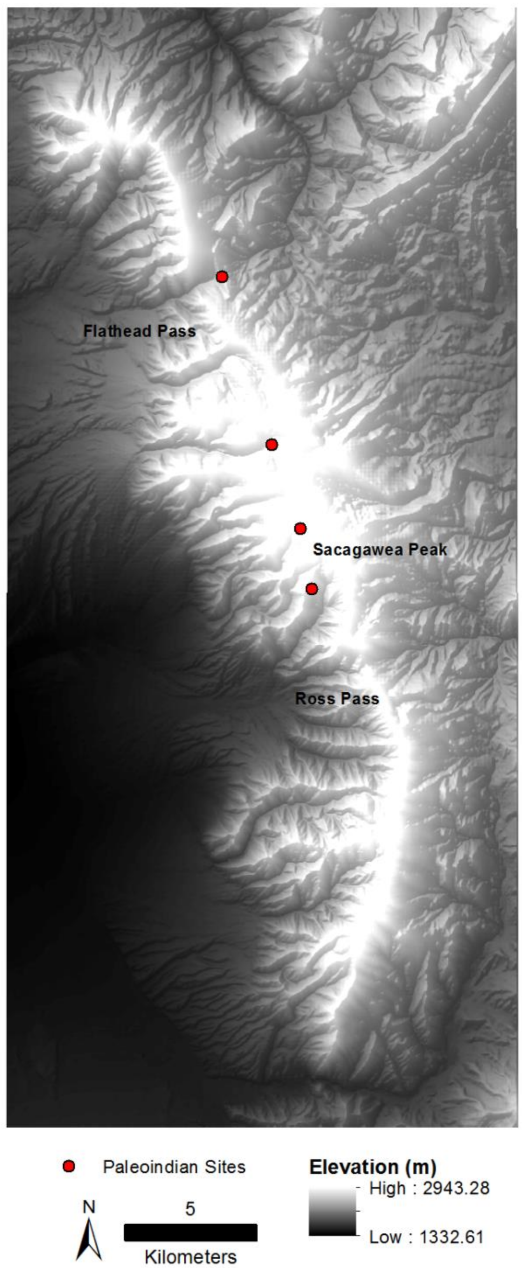


Figure 6.3. Map of sites with Paleoindian projectile points present in the Bridger Mountains.

Table 6.2. Sites with Paleoindian projectile points present.

Site No.	Site Name	Drainage	Time Period	No. of Points	Point Types Present
24GA0303	Flathead Pass	Flathead Pass	Early Paleoindian	1	Clovis
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Late Paleoindian	1	Angostura
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood Canyon	Middle Paleoindian	1	Agate Basin
24GA1672	Limestone Meadow	Limestone Canyon	Late Paleoindian	1	Angostura

Espace *Analysis: Site Function*

The evenness index ranged from 0.78 at Flathead Pass (24GA0303) to 0.82 at the Corbly Basin Cabin Meadow site (24GA0641) (Table 6.3). These values fall within my range for secondary, logistical camps. Such camps can and appear to represent a range of behaviors, from preparing for hunting and processing resources to other domestic activities. For example, the Limestone Meadow site (24GA1672) where archaeologists found one Late Paleoindian point, produced an evenness score of 0.79, within my range for secondary campsites. Although projectile points did make up 46% (n = 32 from Fisher's original database) of the 71 tools recovered at the Limestone Meadow, the site also yielded endscrapers, a drill, and a burin (Figure 6.4; for additional tool type frequencies by site, see Appendix D). Each of these artifact types is associated with resource procurement and the processing, as well as with other general domestic activities occurring at the site. Thus, people could have conducted a number of activities in addition to hunting at the Limestone Meadow and at other similar sites, even if procuring resources was a priority.

Table 6.3. Evenness index scores for sites with Paleoindian projectile points.

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA0303	Flathead Pass	12	82	0.78	Secondary Camp
24GA0641	Corbly Basin, Cabin Meadow	11	100	0.82	Secondary Camp
24GA1634	North Cottonwood, North Fork, Main Camp	11	337	0.79	Secondary Camp
24GA1672	Limestone Meadow	13	125	0.79	Secondary Camp

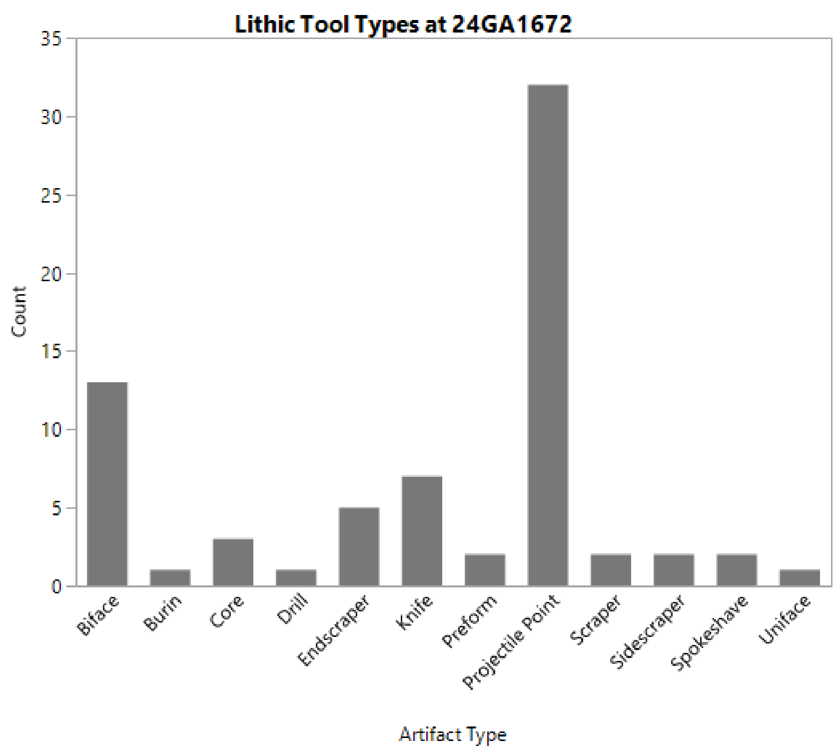


Figure 6.4. Frequency of tool types at the Limestone Meadow site (24GA1672). Projectile points (n = 32 in Fisher's original database) represent the most frequent tool type, but there are other types present as well that suggest a range of activities could have taken place at the site.

Espace *Analysis: Site Location*

As described in Chapter 4, the Paleoindian Period in the Bridger Mountains saw two different climatic episodes at the highest elevations: alpine tundra followed by subalpine parkland of spruce (*Picea*) and whitebark pines (*Pinus albicaulis*). Alpine tundra dominated the upper elevations during the Early Paleoindian Period, and it is perhaps not surprising that there is only one example of an Early Paleoindian artifact, a Clovis point, from Flathead Pass (24GA0303). At an elevation of 2,130 m, the Flathead Pass site would have been below the alpine tundra and ice-capped peaks in the Bridger Mountains during the terminal Pleistocene.

From the Middle and Late Paleoindian Periods, three locations at higher elevations in the mountains coincide with the establishment of the subalpine spruce and whitebark pine parklands during the end of the Pleistocene and early Holocene. All of these sites are located in the subalpine basins in the center of the mountain range at an average elevation of 2,350 m asl (Figure 6.5 and Table 6.4), where people could have accessed edible whitebark pine nuts. Although the sample size is low and any conclusions drawn are suspect, it appears that Paleoindian people established these *esapces* based on the availability of resources in the subalpine basins.

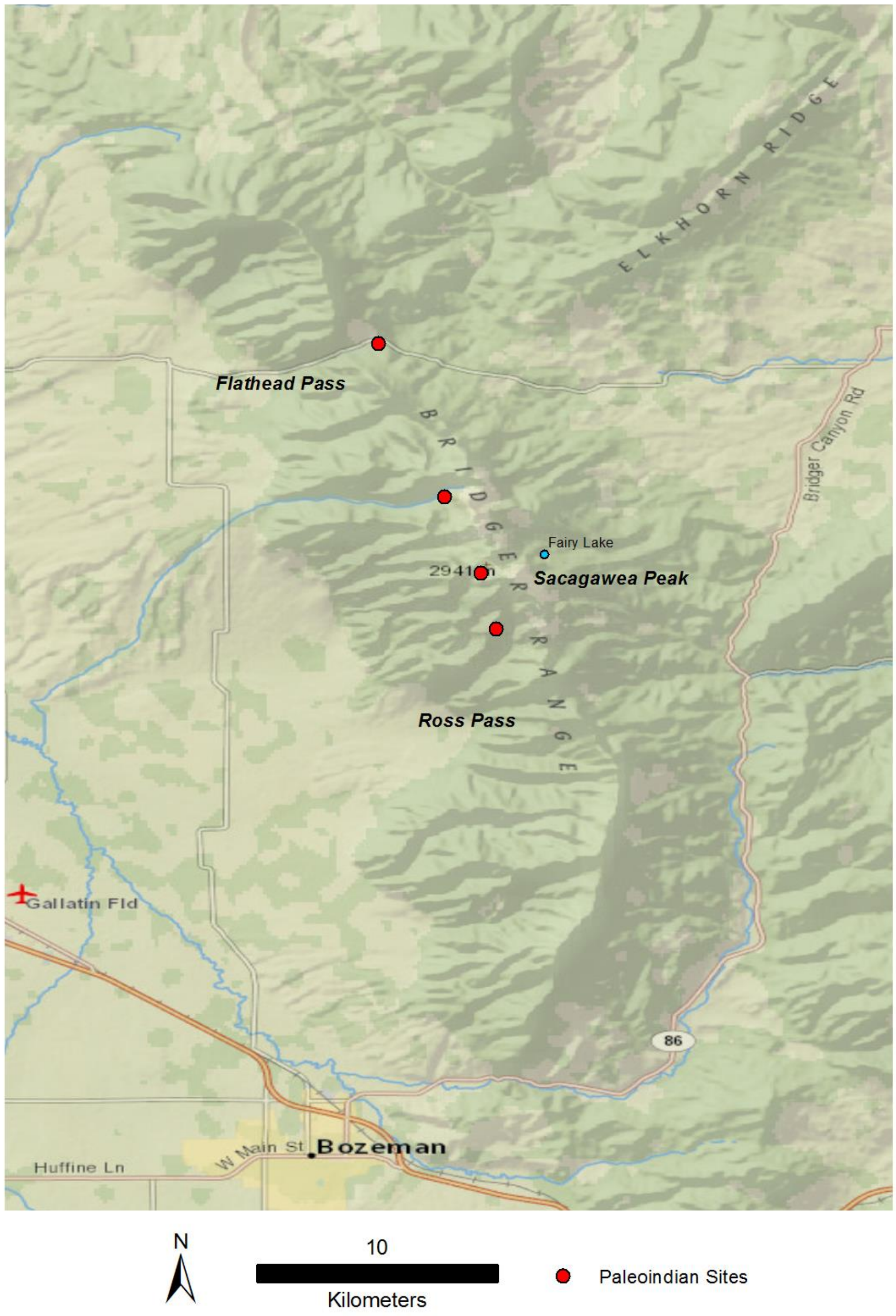


Figure 6.5. Sites with Paleoindian projectile points in the Bridger Mountains, relative to known travel corridors and Fairy Lake.

Table 6.4. Table of sites with Paleoindian projectile points and their elevations. The column "Resources Available" is compiled from Benes (2016) and other known resources described in Chapter 4.

Site No.	Site Name	Drainage	Elevation (m)	Resources Available	Reoccupied?
24GA0303	Flathead Pass	Flathead Pass	2,130	All: travel corridor; Late Paleoindian: whitebark pine nuts	No
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	2,543	All: travel corridor; Late Paleoindian: whitebark pine nuts	No
24GA1634	North Cottonwood Main Camp	North Cottonwood Canyon	2,369	Late Paleoindian: whitebark pine nuts	No
24GA1672	Limestone Meadow	Limestone Canyon	2,356	All: travel corridor; Late Paleoindian: whitebark pine nuts	No

Espace *Analysis: Site Viewsheds*

Viewsheds calculated in ArcGIS for sites with Paleoindian projectile points showed no overlapping views or features in the Bridger Mountains (Figure 6.6 and Table 6.5). The only overlapping viewsheds are oriented toward the southwest, over the Gallatin Valley, from Corbly Basin Cabin Meadow (24GA0641), Limestone Canyon (24GA1672), and Dry Canyon (24GA0645). The results suggest that during the Paleoindian Period, people did not select site locations to view particular geographic features or place-markers within the Bridger Mountains. However, if I expanded the scale of the landscape analyzed (a task beyond the scope of my thesis), it is possible there may be a feature to the southwest that some Paleoindian groups established sites to see.

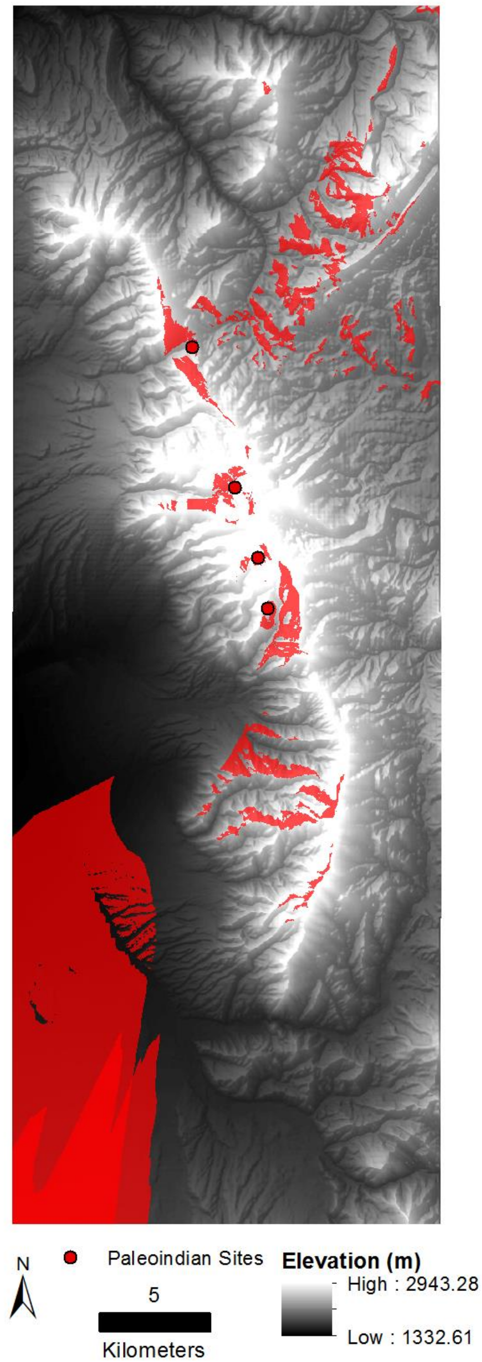


Figure 6.6. Map of viewsheds from sites with Paleoindian projectile points in the Bridger Mountains. Areas of more solid red indicated overlapping viewsheds from sites in the mountains.

Table 6.5. Table of viewable features from sites with Paleoindian projectile points.

Site No.	Site Name	Drainage	Features Viewed
24GA0303	Flathead Pass	Flathead Pass	Shields River Valley
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Sacagawea Peak; Gallatin Valley, southwest
24GA0645	Dry Canyon	Limestone Canyon	Gallatin Valley, southwest
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood Canyon	Hardscrabble Peak, North Cottonwood Canyon
24GA1672	Limestone Meadow	Limestone Canyon	Ross Peak; Mt. Baldy; Gallatin Valley, southwest

Tour *Analysis: Least Cost Path*

When comparing the modeled least-cost paths established by the FETE analysis, all four of the locations with Paleoindian projectile points fall along the most efficient routes through and across the Bridger Mountains, with an average distance from the paths of 52.2 m (Figure 6.7 and Table 6.6). Although Flathead Pass (24GA0303) has the largest distance from the site to the paths at 111.7 m, I suggest that this result stems from my use of a single GPS coordinate for the site, rather than the polygon area and that, in fact, the site's boundaries are much closer to the FETE least-cost paths than my results indicate. The results suggest that Paleoindian groups did choose to use efficient *tours* while in or crossing the mountains.

The results also reinforce assertions by Byers and his colleagues (2003) that people used Flathead Pass and areas between Sacagawea Peak and Ross Peak as travel corridors to cross the mountains. Given that most of the sites with Paleoindian projectile points are located in these traveled areas, I suggest that one of the resources Paleoindian people targeted were the navigable paths through the mountains.

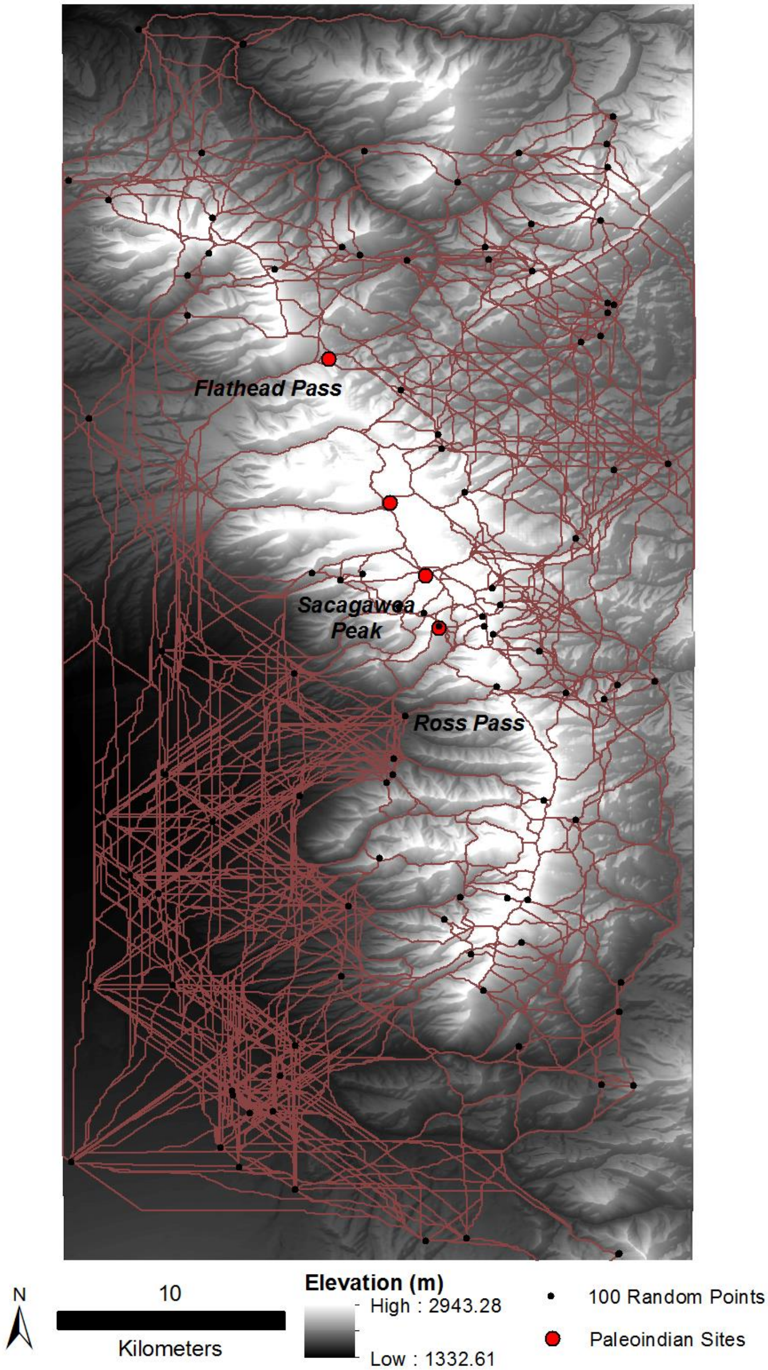


Figure 6.7. Map of the sites with Paleoindian projectile points overlaid over the FETE least-cost paths.

Table 6.6. Distances from each site with a Paleoindian point to the nearest FETE path.

Site Name	Site No.	Known Travel Corridor?	Distance to FETE Least-Cost Paths (m)
Flathead Pass	24GA0303	Flathead Pass	111.7
Corbly Basin, Cabin Meadow	24GA0641	Sacagawea Peak	12.1
North Cottonwood, Main Camp	24GA1634	No	36.4
Limestone Meadow	24GA1672	Sacagawea Peak and Ross Pass	48.6

Summary of Analysis Results for the Paleoindian Period

Each of these four analyses of the *espaces* and *tours* suggest that the people living during the Paleoindian Period created a resource-socialized landscape in the Bridger Mountains. Evenness index scores for site assemblage diversity match those of secondary, logistical campsites, where resource procurement and processing could have taken place among other domestic activities. With the exception of the Clovis projectile point found at Flathead Pass (24GA0303), Paleoindian groups, for the first time, established sites at elevations where whitebark pine nuts would have been abundant. Although there may have been a place-marker off the Bridger Mountains to the southwest in the Gallatin Valley, the viewshed analysis did not reveal any geographic features in the mountains that people may have consistently opted to see. The *tours* that people created coincide with the most efficient routes through the mountains, given that the sites of this period fall along the modeled least-cost paths. Although the results must be viewed as preliminary due to the small sample size of sites, the results suggest that people of the Paleoindian Period created a resource-socialized landscape in the Bridger Mountains.

Early and Middle Archaic Periods

Based on the presence of Hawken, Oxbow, Duncan, and Hanna projectile points (n = 15), archaeologists have documented nine sites with Early and Middle Archaic occupations in the Bridger Mountains to date (Figure 6.8 and Table 6.7). It should be noted that because these periods span 5,000 years, the results must be viewed with reservation, as meaningful cultural differences or similarities will no doubt have been muddled by the long time frame.

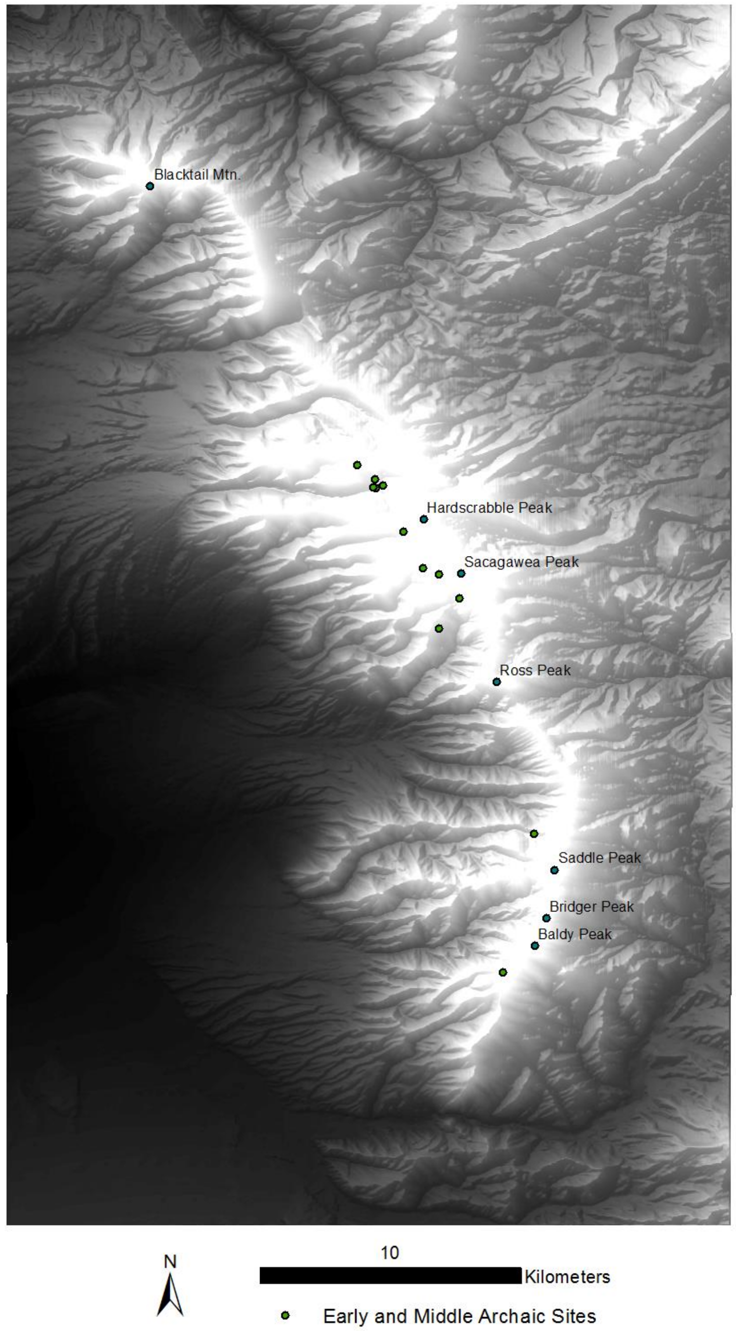


Figure 6.8. Map of sites with Early and Middle Archaic projectile points in the Bridger Mountains.

Table 6.7. Sites with Early and Middle Archaic projectile points in the Bridger Mountains.

Site No.	Site Name	Drainage	Time Period	No. of Points	Projectile Point Types
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Early Archaic	1	Hawken
24GA0645	Limestone	Limestone Canyon	Early and Middle Archaic	2	Oxbow, Duncan
24GA1633	Bostwick Meadow	Bostwick Canyon	Middle Archaic	1	Duncan
24GA1634	North Cottonwood Main Camp	North Cottonwood Canyon	Early and Middle Archaic	4	Oxbow, Duncan, Hanna
24GA1646	North Cottonwood, North Fork, Upper Site	North Cottonwood Canyon	Middle Archaic	1	Duncan or Hanna
24GA1666	North Cottonwood, at Forks	North Cottonwood Canyon	Middle Archaic	1	Duncan
24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	Tom Reese Creek Gulch	Early/Middle Archaic	2	Oxbow
24GA1672	Limestone Meadow	Limestone Canyon	Early/Middle Archaic	2	Oxbow
24GA1759	Corbly Gulch-Limestone Divide	N/A	Middle Archaic	1	Hanna

Espace *Analysis: Site Function*

I calculated the evenness index for the nine sites. Scores ranged from 0.76 at Tom Reese Creek BD-1 (24GA1671) to 0.94 at North Cottonwood at the Forks

(24GA1666), with one site, the Corbly-Limestone Divide site (24GA1759), scoring 0.59 (Table 6.8). The evenness index scores for the majority of sites (n = 8) fall within my range for secondary, logistical camps. The value for the outlier, 24GA1759, corresponds to that expected for a specialized task camp. Given that the site assemblage contained a single chert projectile point and debitage consisting of local BSS, which people used in a largely expedient fashion, it is likely that this site served as a specialized task site between larger sites in Corbly Gulch Basin and those in Limestone Canyon. Although the latter result is interesting and paints a different picture of occupation in the Bridger Mountains by including an example of a specialized task site, I cannot speak confidently about it because the sample size in the assemblage is so much smaller than the other eight. Therefore, it appears that the majority of sites with Early and Middle Archaic projectile points represent secondary, logistical camps. However, just as with the Paleoindian sites, the tool types at these sites suggest that people may have engaged in other activities in addition to hunting, as we would expect for secondary campsites (Appendix D).

Table 6.8. Evenness index scores for sites with Early and Middle Archaic projectile points.

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA0641	Corbly Basin, Cabin Meadow	11	100	0.82	Secondary Camp
24GA0645	Dry Canyon	10	67	0.79	Secondary Camp
24GA1633	Bostwick Meadow	8	51	0.82	Secondary Camp

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA1634	North Cottonwood Main Camp	11	337	0.79	Secondary Camp
24GA1646	North Cottonwood, North Fork, Upper Site	8	25	0.83	Secondary Camp
24GA1666	North Cottonwood, at Forks	5	18	0.94	Secondary Camp
24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	9	99	0.76	Secondary Camp
24GA1672	Limestone Meadow	13	125	0.79	Secondary Camp
24GA1759	Corbly Gulch-Limestone Divide	2	7	0.59	Specialized Task Site

Espace *Analysis: Site Location*

The Early and Middle Archaic Periods coincide with the onset of the Altithermal at the beginning of the Holocene, an event that significantly altered the environment in the Bridger Mountains. The vegetation changed to Douglas fir (*Pseudotsuga*) parkland around the elevation of Fairy Lake and the occurrence of fires increased from earlier periods (Benes 2016; see Table 4.1). During this time, people established and maintained sites throughout the Bridger Mountains (Figure 6.9 and Table 6.9). People established some new sites, such as Bostwick Meadow (24GA1633) and Tom Reese Creek BD-1 (24GA1671), and reoccupied others used in the Paleoindian Period, such as the North Cottonwood Main Camp site (24GA1634), the Corbly Basin Cabin Meadow site (24GA0641), and the Limestone Meadow site (24GA1672). Thus, Early and Middle Archaic groups evidently selected some sites based on newly available resources and maintained other locations used during the Paleoindian Period.

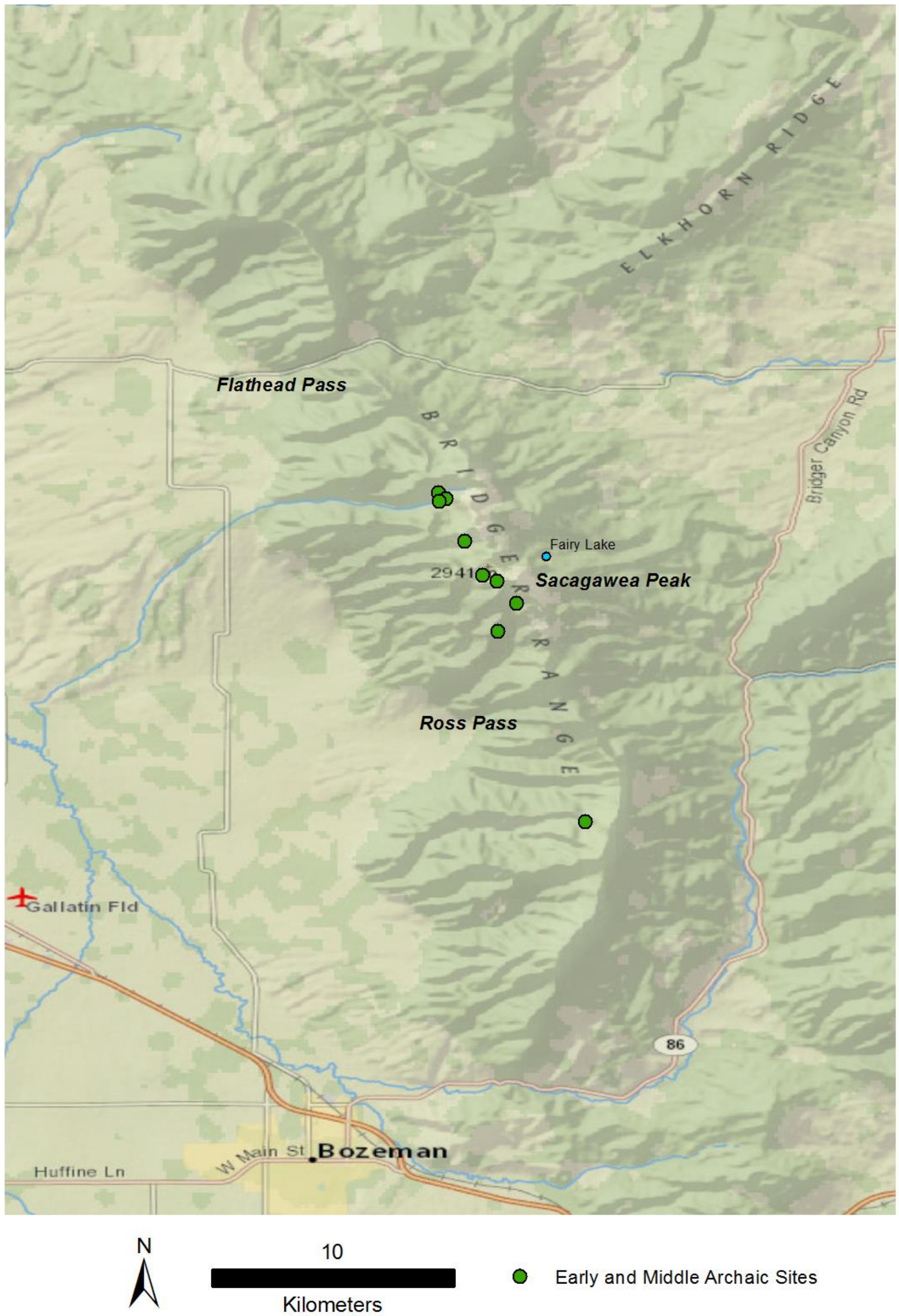


Figure 6.9. Sites with Early and Middle Archaic projectile points in the Bridger Mountains, relative to known travel corridors and Fairy Lake.

Table 6.9. Table of sites with Early and Middle Archaic projectile points and their elevations. The column "Resources Available" is compiled from Benes (2016) and other known resources described in Chapter 4.

Site No.	Site Name	Drainage	Elevation (m)	Resources Available	Reoccupied?
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	2,543	Whitebark pine nuts and travel corridor	Yes
24GA0645	Limestone	Limestone	2,490	Whitebark pine nuts and travel corridor	No
24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	2,235	Whitebark pine nuts	No
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood Canyon	2,369	Whitebark pine nuts	Yes
24GA1646	North Cottonwood, North Fork, Upper Site	North Cottonwood Canyon	2,419	Whitebark pine nuts	No
24GA1666	North Cottonwood, at Fork of North & South Forks	North Cottonwood Canyon	2,332	Whitebark pine nuts	No
24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	Tom Reese Creek Gulch	2,563	Whitebark pine nuts and Bridger Silicified Siltstone	No
24GA1672	Limestone Meadow	Limestone Canyon	2,356	Whitebark pine nuts and travel corridor	Yes
24GA1759	Corbly Gulch-Limestone Divide	N/A	2,724	Whitebark pine nuts and travel corridor	No

Espace *Analysis: Site Viewsheds*

The viewshed analyses from sites with Early and Middle Archaic projectile points revealed several features that people could see from sites of that age in the Bridger Mountains (Figure 6.10 and Table 6.10). People could see Hardscrabble Peak from two locations (24GA1634 and 24GA1671) and Ross Peak from two locations (24GA1672 and 24GA1759). However, these sites are adjacent to the viewed peak, and it is difficult to determine whether or not people intentionally selected the sites with those views in mind. Four sites also had a southwest view of the Gallatin Valley (24GA0641, 24GA0645, 24GA1672, and 24GA1759). One site faced Blacktail Mountain, where there is rock art from the Late Archaic and Late Pre-Contact Periods, although, again, it is impossible to determine whether or not that viewshed was intentionally selected with a sample size of one. Overall, only the southwest view of the Gallatin Valley appears to be consistently selected, and, as a result, I cannot conclude that there were visible place-markers within the Bridger Mountains during this period.

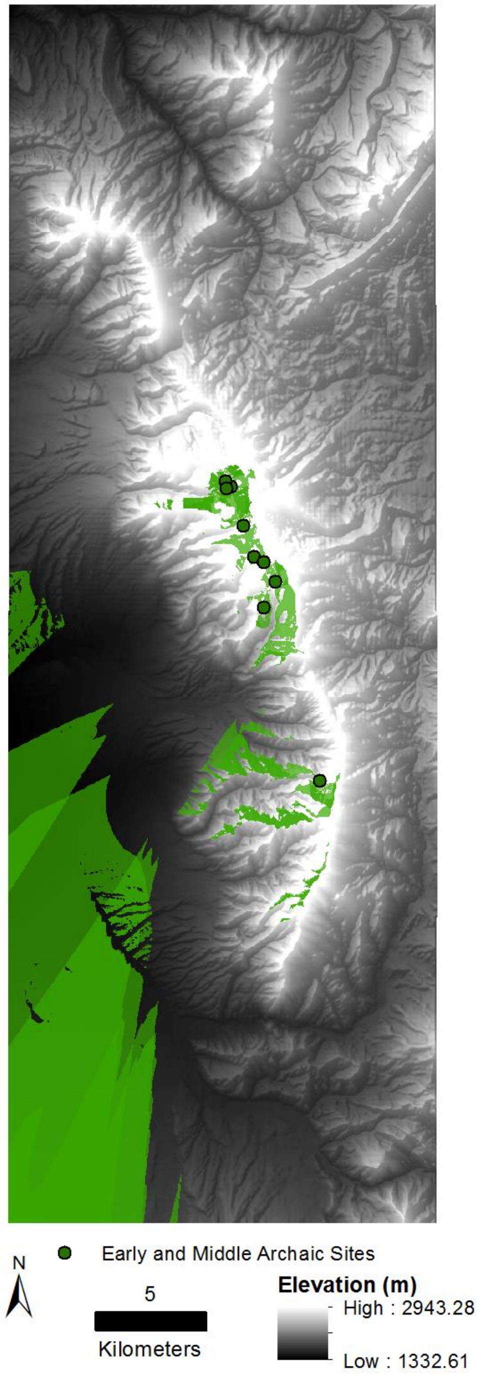


Figure 6.10. Map of viewsheds from sites with Early and Middle Archaic projectile points in the Bridger Mountains. Areas of more solid green indicate overlapping viewsheds.

Table 6.10. Table of viewable features from sites with Early and Middle Archaic projectiles points.

Site No.	Site Name	Drainage	Features Viewed
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Sacagawea Peak; Gallatin Valley, southwest
24GA0645	Limestone	Limestone	Gallatin Valley, southwest
24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	Saddle Peak
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Hardscrabble Peak, North Cottonwood Canyon
24GA1646	North Cottonwood, North Fork, Upper Site	North Cottonwood	North Cottonwood Canyon
24GA1666	North Cottonwood, at Fork of North & South Forks	North Cottonwood	North Cottonwood Canyon
24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	Tom Reese Creek	Hardscrabble Peak; Gallatin Valley, west
24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Ross Peak; Mt. Baldy; Gallatin Valley, southwest
24GA1759	Corbly Gulch-Limestone Divide	N/A	Ross Peak; Mt. Baldy; Gallatin Valley, southwest

Tour *Analysis: Least Cost Path*

The majority of sites with Early and Middle Archaic projectile points are located, on average, within 65.2 m of the FETE least-cost paths, suggesting people created efficient *tours* to navigate the Bridger Mountains (Figure 6.11 and Table 6.11). These *tours* include the same travel corridors used during the Paleoindian Period. Interestingly, however, sites in North Cottonwood Canyon are an exception. Although the largest site, North Cottonwood Main Camp (24GA1634), and one other occur along the least-cost paths, one is not located near the paths: the North Cottonwood Upper Site (24GA1646), located 185.4 m from the nearest modeled path. Two interpretations could explain this result. Either there are efficient trails to this site that were not captured by the analysis because it used randomly generated points as opposed to those from a grid (i.e., White and Barber 2012), or other cultural factors guided people to establish these sites and the *tours* used to reach them. The number of sites at the top of the North Cottonwood Canyon in addition to the location off the modeled efficient trails suggest that there may have been other motivations beyond resources for locating sites in this area and for the ways people chose to travel there.

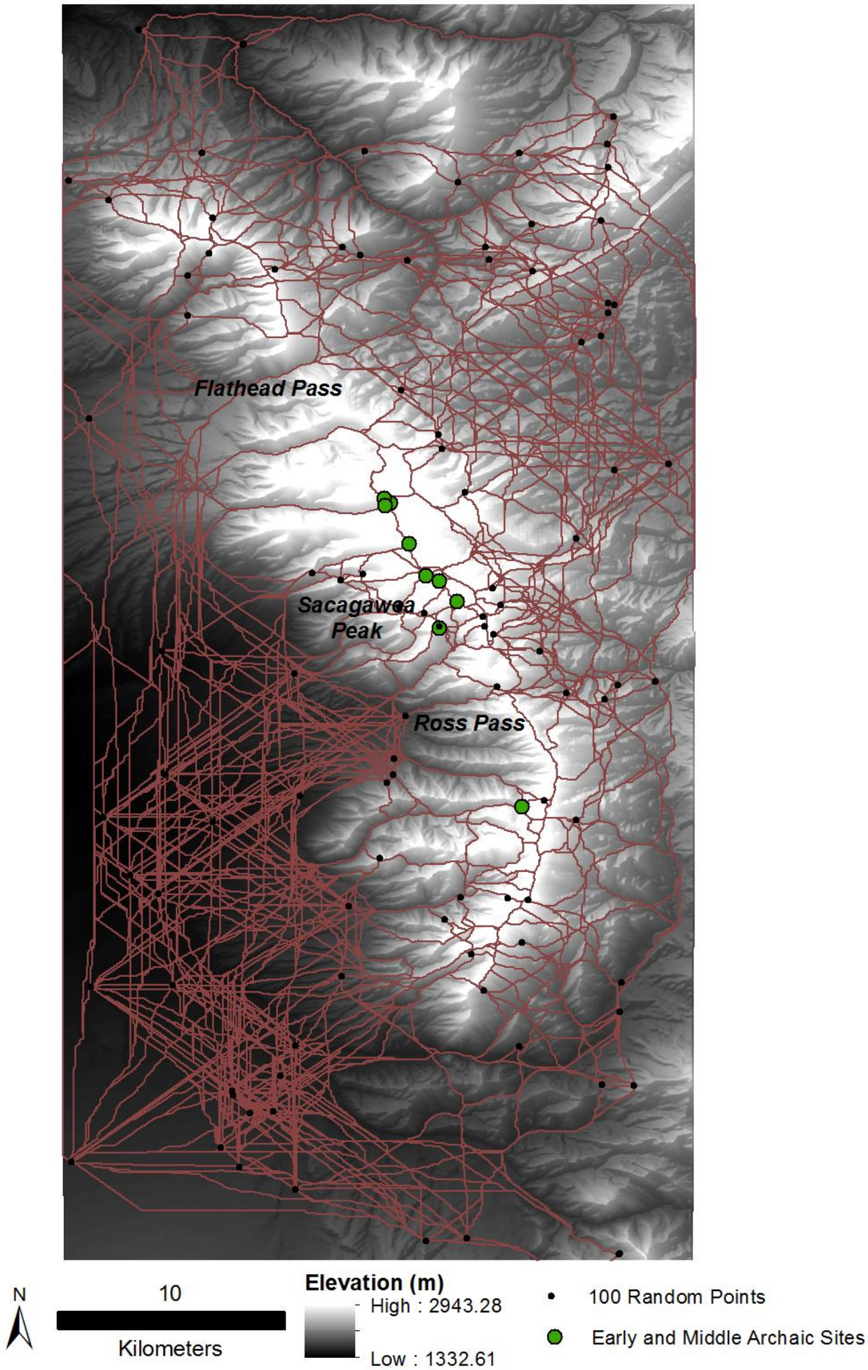


Figure 6.11. Map of the sites with Early and Middle Archaic projectile points overlaid onto the FETE least-cost paths.

Table 6.11. Distance of sites with Early and Middle Archaic projectile points to the nearest FETE path.

Site Name	Site No.	Known Travel Corridor?	Distance to FETE Least-Cost Paths (m)
Corbly Basin, Cabin Meadow	24GA0641	Sacagawea Peak	12.1
Dry Canyon	24GA0645	Sacagawea Peak and Ross Peak	97.9
Bostwick Meadow	24GA1633	No	43
North Cottonwood, Main Camp	24GA1634	No	36.4
North Cottonwood, Upper Site	24GA1646	No	185.4
North Cottonwood at the Forks	24GA1666	No	17.2
Tom Reese Creek, BD-1	24GA1671	No	111.7
Limestone Meadow	24GA1672	Sacagawea Peak and Ross Pass	48.6
Corbly-Limestone Divide	24GA1759	Sacagawea Peak	34.4

Summary of Analysis Results for the Early and Middle Archaic Periods

The *espace* and *tour* analyses suggest that the Early and Middle Archaic groups who visited the Bridger Mountains focused largely on procuring resources on a landscape where people had also established *tour* place-markers. Evenness index scores indicate that the majority of sites match those of secondary, logistical camps, with a single example of a potential specialized task camp. New site locations occur largely within the Douglas fir parkland established during the late Early and Middle Archaic. However, people did reoccupy Paleoindian sites within travel corridors. The only significant overlap in viewsheds occurred overlooking the Gallatin Valley to the southwest. Although there might be other factors involved in the site locations and *tours* in North Cottonwood Canyon, the majority of sites aligned with the modeled least-cost paths. As a result, I suggest that Early and Middle Archaic people created a composite socialized landscape targeting resource procurement and traveling familiar routes.

Late Archaic Period

The presence of 55 Pelican Lake and Besant projectile points identified ten sites for the Late Archaic period (Figure 6.12 and Table 6.12). Relative to all other time frames, the Late Archaic is overrepresented in the Bridger Mountains with points of that age composing 63% of the projectile points in the collection. This larger sample size facilitates meaningful statistical analysis and more confident interpretations about *espace* and *tour* analyses from this period.

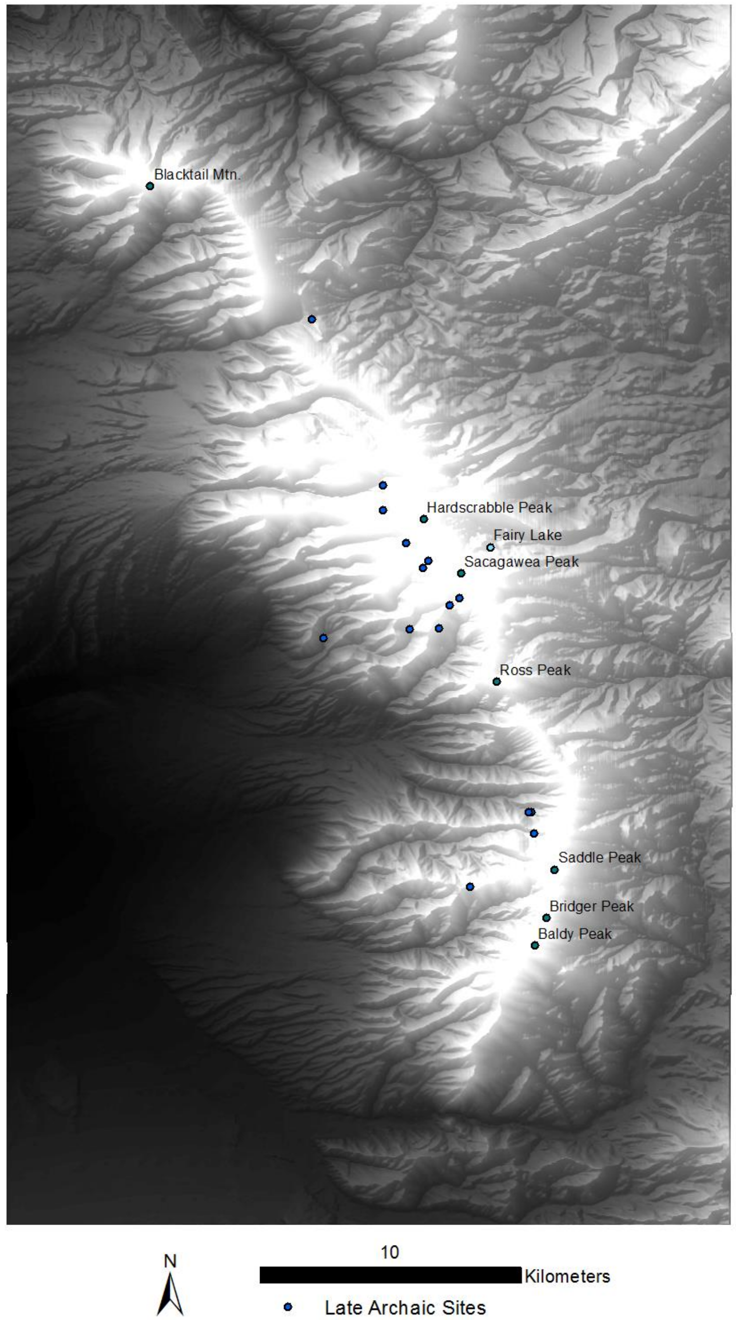


Figure 6.12. Map of sites with Late Archaic projectile points in the Bridger Mountains.

Table 6.12. Sites in the Bridger Mountains with Late Archaic projectile points.

Site No.	Site Name	Drainage	Time Period	No. of Points	Projectile Point Types
24GA0303	Flathead Pass	Flathead Pass	Late Archaic	5	Pelican Lake, Besant
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Late Archaic	12	Pelican Lake, Besant
24GA0645	Upper Dry Canyon	Limestone Canyon	Late Archaic	2	Pelican Lake, Besant
24GA0648	Site B16	North Cottonwood Canyon	Late Archaic	1	Besant
24GA1065	Tom Reese Creek, B18	Tom Reese Creek	Late Archaic	1	Pelican Lake
24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	Late Archaic	2	Pelican Lake, Besant
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood Canyon	Late Archaic	21	Pelican Lake, Besant
24GA1637	Limestone Trail, IF 10	Limestone Canyon	Late Archaic	1	Pelican Lake
24GA1641	Schafer Canyon 1	Schafer Canyon	Late Archaic	1	Besant
24GA1672	Limestone Meadow	Limestone Canyon	Late Archaic	9	Pelican Lake, Besant

Espace *Analysis: Site Function*

The evenness index scores for the ten sites with Late Archaic projectile points range from 0.78 at Flathead Pass (24GA0303) to 0.97 at Schafer Canyon 1 (24GA1641) (Table 6.13). All of these sites fall within the range of secondary, logistical camps, suggesting that a range of activities could have taken place at these sites while people were there to procure resources.

Table 6.13. Evenness scores for sites with Late Archaic projectile points.

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA0303	Flathead Pass	12	82	0.78	Secondary Camp
24GA0641	Corbly Basin, Cabin Meadow	11	100	0.82	Secondary Camp
24GA0645	Upper Dry Canyon	10	67	0.79	Secondary Camp
24GA0648	Site B16	9	55	0.72	Secondary Camp
24GA1065	Tom Reese Creek, B18	11	33	0.78	Secondary Camp
24GA1633	Bostwick Meadow	8	51	0.82	Secondary Camp
24GA1634	North Cottonwood Main Camp	11	337	0.79	Secondary Camp
24GA1637	Limestone Trail, IF 10	3	5	0.86	Secondary Camp
24GA1641	Schafer Canyon 1	7	10	0.97	Secondary Camp
24GA1672	Limestone Meadow	13	125	0.79	Secondary Camp

Espace *Analysis: Site Location*

The Late Archaic Period overlaps with the establishment of pine (*Pinus*), spruce (*Picea*), and fir (*Abies*) parklands, meadows, and some aspen groves in the Bridger Mountains, whereas whitebark pine forests shrank. At this time, when the average site elevation was 2,388 m asl, people occupied new sites, such as Tom Reese Creek B18 (24GA1065) and Schafer Canyon 1 (24GA1641), but also reoccupied older ones, such as Corbly Basin Cabin Meadow (24GA0641) and North Cottonwood Main Camp (24GA1634) (Figure 6.13 and Table 6.14). Many of the reoccupied sites are located near known travel corridors. Thus, although the climate did change, people continued to use the same sites others had used previously, while also establishing new ones.

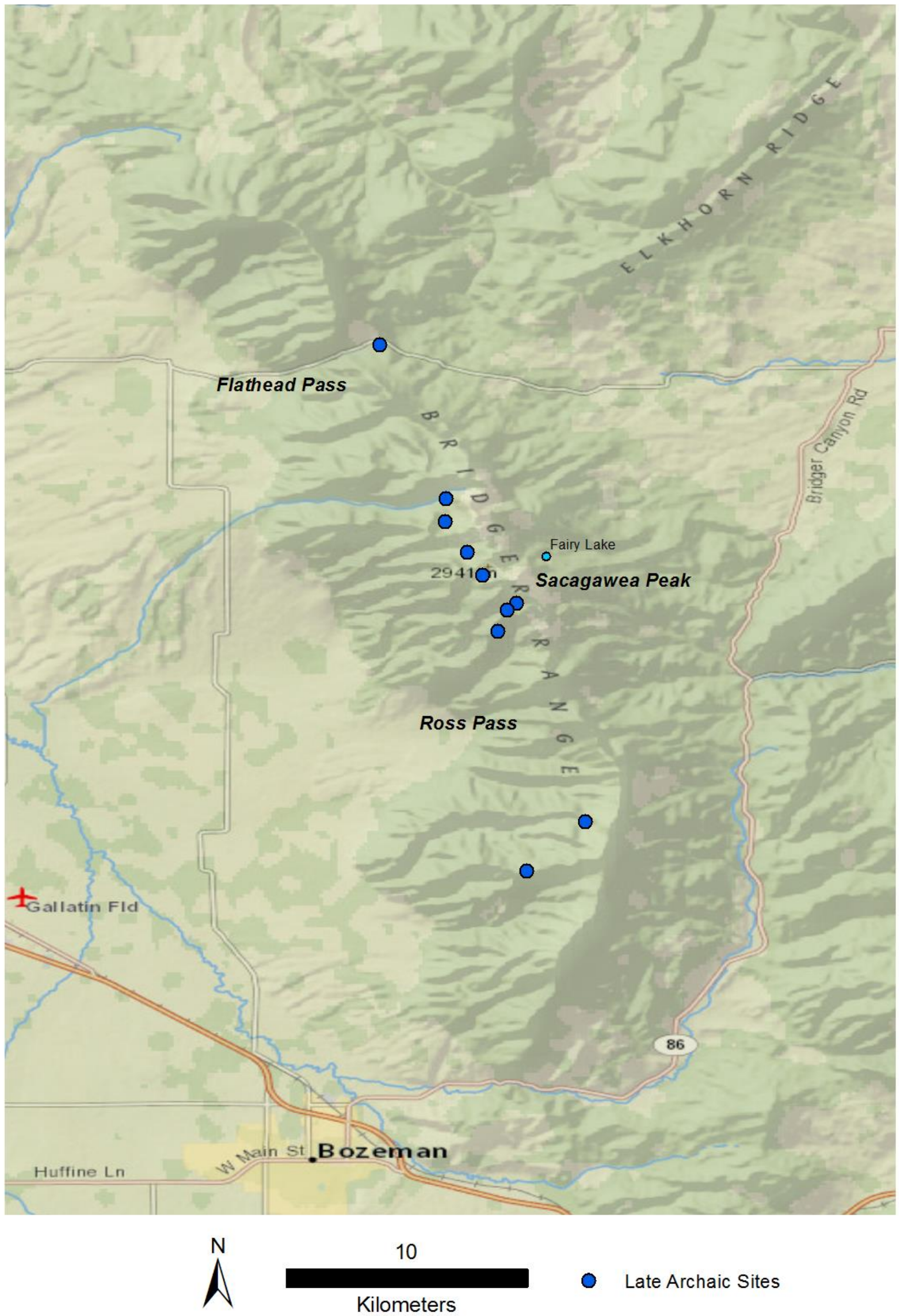


Figure 6.13. Sites with Late Archaic projectile points in the Bridger Mountains, relative to known travel corridors and Fairy Lake.

Table 6.14. Table of sites with Late Archaic projectile points and their elevations. The column "Resources Available" is compiled from Benes (2016) and other known resources described in Chapter 4.

Site No.	Site Name	Drainage	Elevation (m)	Resources Available	Reoccupied?
24GA0303	Flathead Pass	Flathead Pass	2,130	Travel corridor	Yes
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	2,543	Travel corridor	Yes
24GA0645	Upper Dry Canyon	Dry Creek	2,490	Travel corridor	Yes
24GA0648	Site B16	North Cottonwood	2,520	Specific resources unknown	Yes
24GA1065	Tom Reese Creek, B18	Tom Reese Creek	2,520	Bridger Silicified Siltstone	No
24GA1633	Bostwick Meadow (BSD2)	Bostwick	2,235	Specific resources unknown	Yes
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	2,369	Specific resources unknown	Yes
24GA1637	Limestone Trail, IF 10	Limestone Canyon	2,417	Travel corridor	No
24GA1641	Schafer Canyon 1	Schafer Canyon	2,305	Specific resources unknown	No
24GA1672	Limestone Meadow	Limestone Canyon	2,356	Travel corridor	Yes

Espace *Analysis: Site Viewsheds*

Viewsheds from sites with Late Archaic projectile points overlapped on Sacagawea Peak (n = 3), Hardscrabble Peak (n = 3), and Ross Peak (n = 2) (Figure 6.14 and Table 6.15). However, many of these overlaps occurred because sites were located in the same or adjacent drainages, so those locations may not indicate viewshed preference. The only individual viewshed of any interest is that from Schafer 1 (24GA1641). It is the only site in the Bridger Mountains with a viewshed that looks northwest, toward Blacktail Cave where Late Archaic rock art has previously identified (Allen 1989; Greer and Greer 1996).

In contrast, as with previous periods, five sites had overlapping views looking southwest over the Gallatin Valley. I suggest that the only significant viewshed selection was toward the southwest over the Gallatin Valley during the Late Archaic Period.

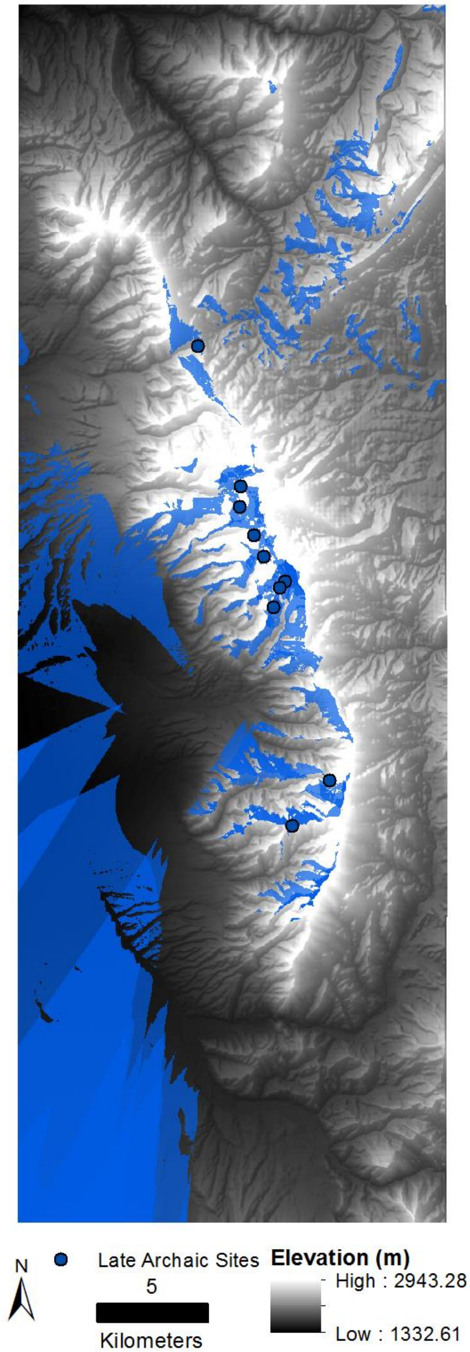


Figure 6.14. Map of viewsheds from sites with Late Archaic projectiles points.

Table 6.15. Viewable features from sites with Late Archaic projectiles points.

Site No.	Site Name	Drainage	Features Viewed
24GA0303	Flathead Pass	Flathead Pass	Shields River Valley
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Sacagawea Peak; Gallatin Valley, southwest
24GA0645	Upper Dry Canyon	Limestone	Gallatin Valley, southwest
24GA0648	Site B16	North Cottonwood	Hardscrabble Peak, North Cottonwood Canyon
24GA1065	Tom Reese Creek, B18	Tom Reese Creek	Hardscrabble Peak
24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	Saddle Peak
24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Hardscrabble Peak, North Cottonwood Canyon
24GA1637	Limestone Trail, IF 10	Limestone	Sacagawea Peak
24GA1641	Schafer Canyon 1	Schafer Canyon	Sacagawea Peak; Ross Peak; Ross Pass; Gallatin Valley, south and west
24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Ross Peak; Mt. Baldy; Gallatin Valley, southwest

Tour *Analysis*

Nearly all of the sites with Late Archaic projectile points occur near the least-cost paths generated by the FETE analysis, including the same known travel corridors used by Paleoindian and (or) earlier Archaic groups (Figure 6.15 and Table 6.16). However, the average distance from the paths (n = 170 m) is exaggerated by one site: Schafer Canyon 1 (24GA1641). If Schafer Canyon 1 is not included, the average distance to modeled paths is reduced to 80.1 m. This site is the only site that is not near a modeled efficient path. The nearest path is nearly one kilometer away (n = 979.3 m). Because the site is located on a ridgeline, I do not believe this distance is the result of using a single coordinate instead of a polygon for a site, and offers an example of a potential non-efficient path to an *espace*.

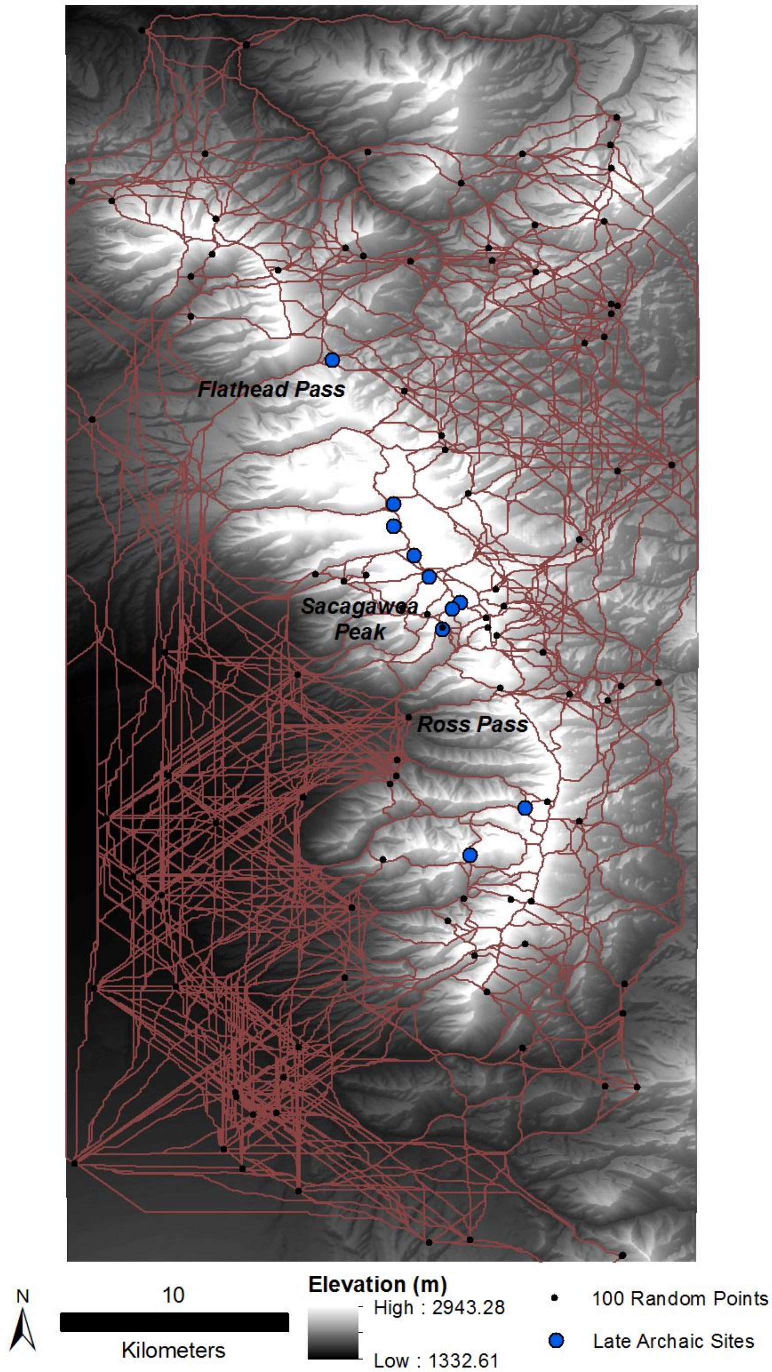


Figure 6.15. Map of the sites with Late Archaic projectile points overlaid on the FETE least-cost paths.

Table 6.16. Distance from sites with Late Archaic projectile points to the nearest FETE least-cost path.

Site Name	Site No.	Known Travel Corridor?	Distance to FETE Least-Cost Paths (m)
Flathead Pass	24GA0303	Flathead Pass	111.7
Corbly Basin, Cabin Meadow	24GA0641	Sacagawea Peak	12.1
Dry Canyon	24GA0645	Sacagawea Peak and Ross Peak	97.9
B16	24GA0648	No	217.3
Tom Reese Creek, B18	24GA1065	No	164.1
Bostwick Meadow	24GA1633	No	24.3
North Cottonwood, Main Camp	24GA1634	No	36.4
Limestone Trail	24GA1637	Sacagawea Peak and Ross Peak	8.6
Schafer Canyon 1	24GA1641	No	979.3
Limestone Meadow	24GA1672	Sacagawea Peak and Ross Pass	48.6

Summary of Analysis Results for the Late Archaic Period

The results of each of the analyses suggest that people in the Late Archaic Period created a composite socialized landscape. Based on the evenness index values, people primarily occupied secondary, logistical camps (i.e., camps focused on resource procurement but where other activities also took place). Although people established sites in new places, they also reoccupied previously used site locations, suggesting that those sites or nearby travel corridors may have been place-markers. As in earlier periods, the only convincing overlaps in viewsheds were oriented to the southwest of the Gallatin Valley, and none were in the Bridger Mountains themselves. Most sites also fell along the modeled least-cost paths, with the exception of Schafer Canyon 1 (24GA1641). Thus, I suggest that Late Archaic groups created a composite socialized landscape in the Late Archaic Period.

Late Pre-Contact Period

With projectile point types of Avonlea, Old Woman's Phase, Plains Side Notched, and corner-notch and tri-notch points (n = 13), a total of six sites date to the Late Pre-Contact Period (Figure 6.16 and Table 6.17). It is interesting to note that although this period encompasses roughly the same amount of time as the preceding Late Archaic Period, the specimens of this age represent only 15% of all typed projectile points in the Bridger Mountains.

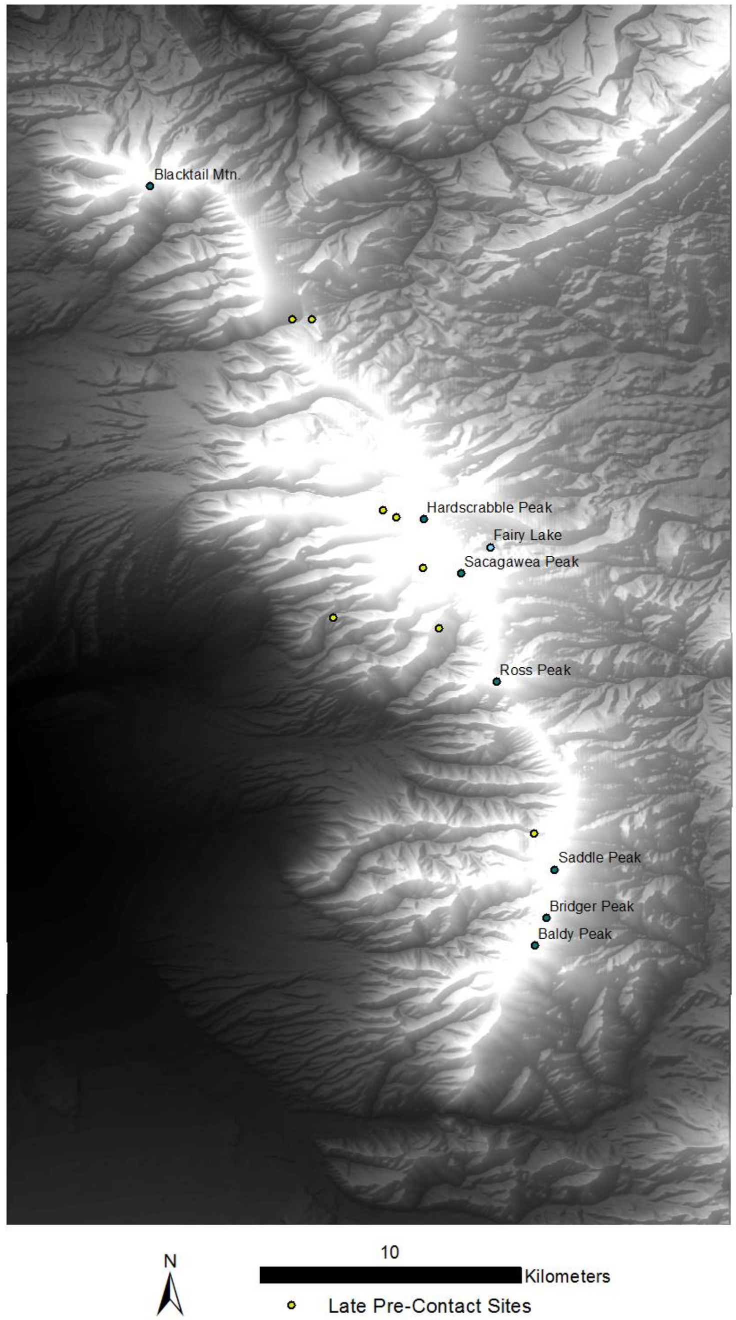


Figure 6.16. Map of sites with Late Pre-Contact projectile points in the Bridger Mountains.

Table 6.17. Sites with Late Pre-Contact projectile points in the Bridger Mountains.

Site No.	Site Name	Drainage	Time Period	No. of Points	Projectile Point Types
24GA0303	Flathead Pass	Flathead Pass	Late Pre-Contact	4	Avonlea, Tri-notch
24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Late Pre-Contact	3	Tri-notch, corner notched arrow point
24GA0648	B17, Area A	North Cottonwood Canyon	Late Pre-Contact	1	Corner notched arrow point
24GA1633	Bostwick Meadow	Bostwick Canyon	Late Pre-Contact	1	Avonlea
24GA1669	Flathead Pass, Rocky Mountain Road	Flathead Pass	Late Pre-Contact	1	Plains Side Notch
24GA1672	Limestone Meadow	Limestone Canyon	Late Pre-Contact	3	Avonlea, Plains Side Notch

Espace *Analysis*: *Site Function*

The evenness scores for the six sites with Late Pre-Contact projectile points range from 0.72 at 24GA0648 to 0.85 at Rocky Mountain Road site (24GA1669) (Table 6.18). Each of the scores from these six sites fall within my defined range for secondary, logistical camps in the Bridger Mountains, where a number of activities could have taken place in addition to resource procurement.

Table 6.18. Evenness scores for sites with Late Pre-Contact projectile points.

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA0303	Flathead Pass	12	82	0.78	Secondary Camp

Site No.	Site Name	Number of Tool Types	Number of All Tools	Evenness Index	Site Type
24GA0641	Corbly Basin, Cabin Meadow, West	11	100	0.82	Secondary Camp
24GA0648	B17, Area A	9	55	0.72	Secondary Camp
24GA1633	Bostwick Meadow	8	51	0.82	Secondary Camp
24GA1669	Flathead Pass, Rocky Mountain Road	8	32	0.85	Secondary Camp
24GA1672	Limestone Canyon, First Upper Meadow	13	125	0.79	Secondary Camp

Espace *Analysis: Site Location*

Figure 6.17 shows the locations of sites with Late Pre-Contact projectile points in the Bridger Mountains, at an average elevation of 2,306 m asl. During this time, the presence of mixed forests of pine (*Pinus*), spruce (*Picea*), and fir (*Abies*) and meadows continued, and, in fact, persist to the present day (Table 6.19). People largely occupied sites that had been used in previous periods. The exception is Rocky Mountain Road (24GA1669), located near Flathead Pass (24GA0303). Because this site occurs close to other sites occupied both at this time and earlier, people preferentially revisited sites during this period rather than establishing new ones. In addition, four of the six Late Pre-Contact sites were located near a travel corridor across the mountains, suggesting the importance of such *tours* to these groups.

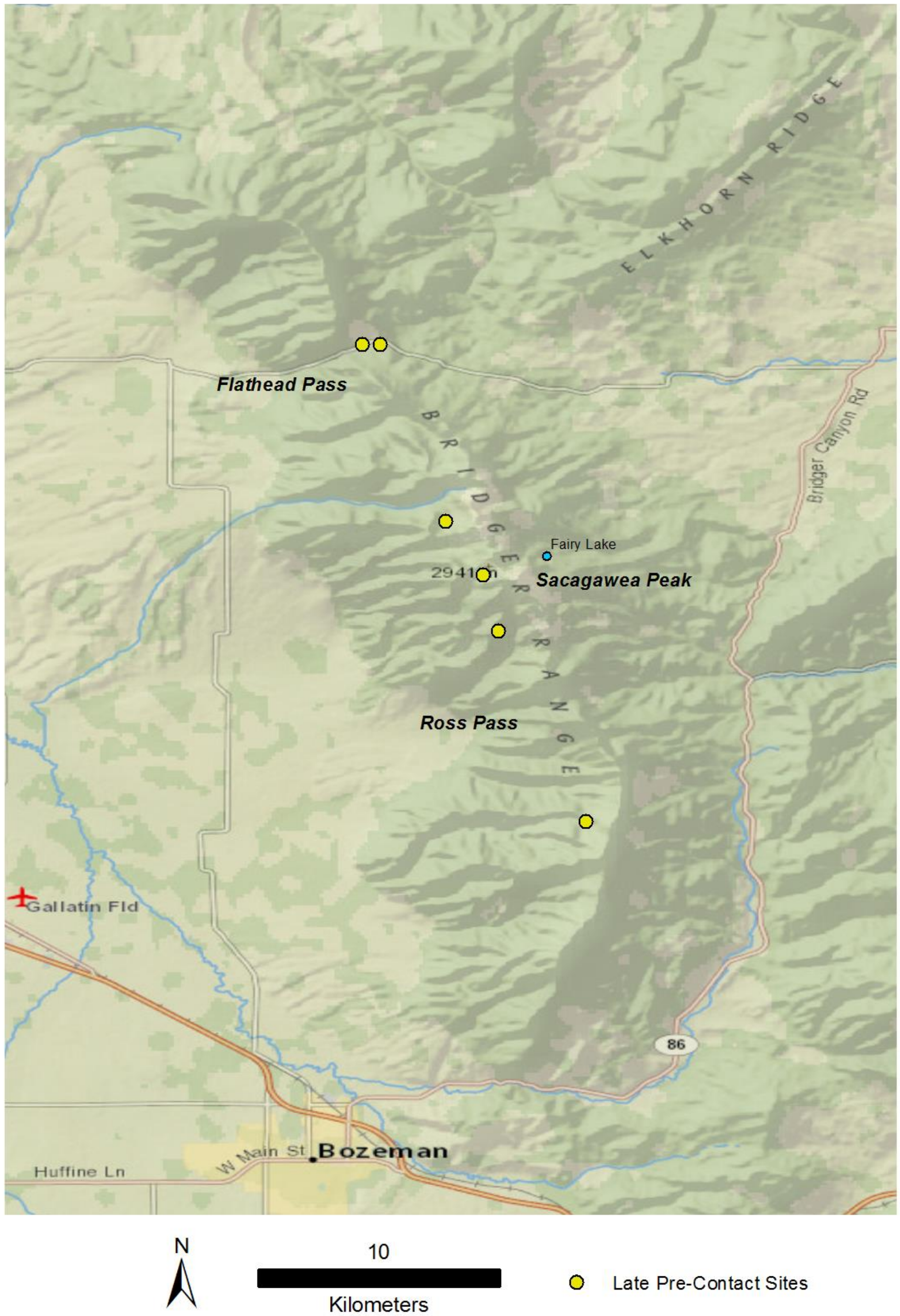


Figure 6.17. Locations of sites with Late Pre-Contact projectile points in the Bridger Mountains, with known travel corridors and Fairy Lake labeled for reference.

Table 6.19. Table of sites with Late Pre-Contact projectile points and their elevations. I compiled the column "Resources Available" from Benes (2016), the current environmental data (Appendix A), and other known resources described in Chapter 4.

Site No.	Site Name	Drainage	Elevation (m)	Resources Available	Reoccupied?
24GA0303	Flathead Pass	Flathead Pass	2,130	Travel corridor; mule deer, elk, moose; huckleberry, bluebunch wheatgrass, Idaho fescue	Yes
24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	2,543	Travel corridor; mule deer, elk, moose; grouse whortleberry, Idaho fescue, whitebark pine nuts, Hayden clover	Yes
24GA0648	B17, Area A	North Cottonwood Canyon	2,520	Mule deer, elk, moose; grouse whortleberry, Idaho fescue, whitebark pine nuts, Hayden clover	Yes
24GA1633	Bostwick Meadow	Bostwick Canyon	2,235	Mule deer, elk, moose; grouse whortleberry, Idaho fescue, whitebark pine nuts, Hayden clover	Yes
24GA1669	Flathead Pass, Rocky Mountain Road	Flathead Pass	2051	Travel corridor; mule deer, elk, moose; huckleberry, bluebunch wheatgrass, Idaho fescue	No
24GA1672	Limestone Canyon, First Upper Meadow	Limestone Canyon	2356	Travel corridor; mule deer, elk, moose; grouse whortleberry, Idaho fescue, whitebark pine nuts, Hayden clover	Yes

Espace *Analysis: Site Viewsheds*

Of the eight locations with Late Pre-Contact projectile points, only three have overlapping viewsheds, and they again look southwest over the Gallatin Valley (24GA0641 and 24GA1672) (Figure 6.18 and Table 6.20). No features in the Bridger Mountain could be viewed from multiple sites.

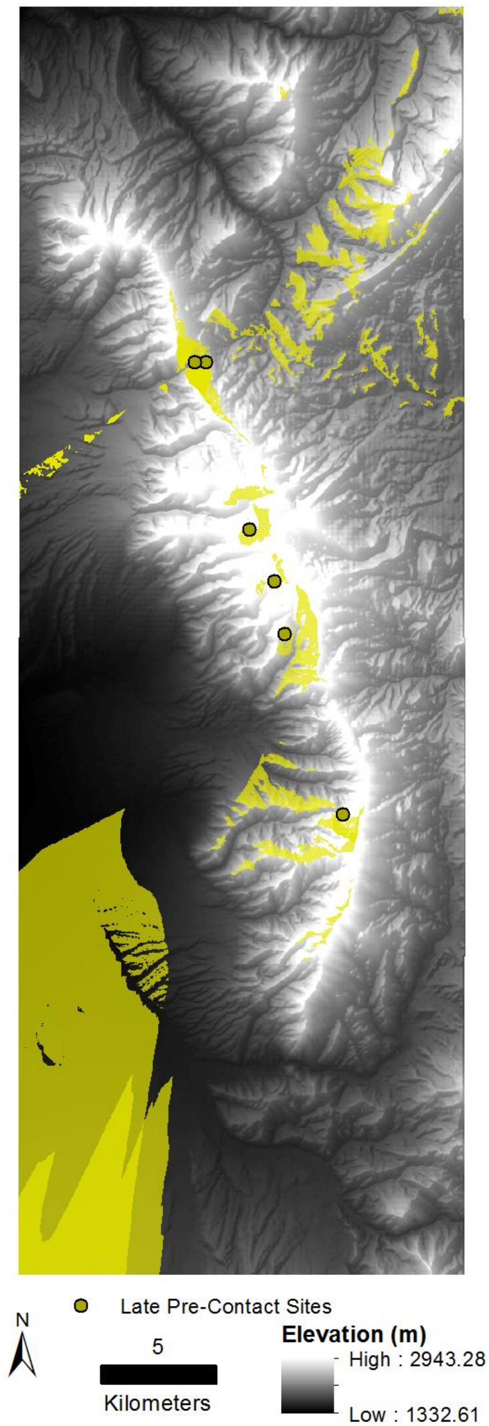


Figure 6.18. Map of viewsheds from sites with Late Pre-Contact projectile points. Areas of overlap are indicated by more solid yellow.

Table 6.20. Viewsheds of sites with Late Pre-Contact projectile points.

Site No.	Site Name	Drainage	Features Viewed
24GA0303	Flathead Pass	Flathead Pass	Shields River Valley
24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Sacagawea Peak; Gallatin Valley, southwest
24GA0648	Site B16	North Cottonwood	Hardscrabble Peak, North Cottonwood Canyon
24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	Saddle Peak
24GA1669	Flathead Pass, Rocky Mountain Road	Flathead Pass	Gallatin Valley, west
24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Ross Peak; Mt. Baldy; Gallatin Valley, southwest

Tour *Analysis: Least Cost Path*

All the sites with Late Pre-Contact projectile points occurred an average of 94.1 m from the modeled least-cost paths (Figure 6.19 and Table 6.21). Sites that contribute to this higher average distance from the modeled paths are the same in previous periods that I suggest may have had inaccurate distance calculations, because I used a single coordinate for the analysis rather than a site polygon. As with the Paleoindian Period, with the exception of Bostwick Meadow (24GA1633), the sites are also located near known travel corridors used throughout the Pre-Contact periods. Overall, this result suggests that people created efficient *tours* across the landscape.

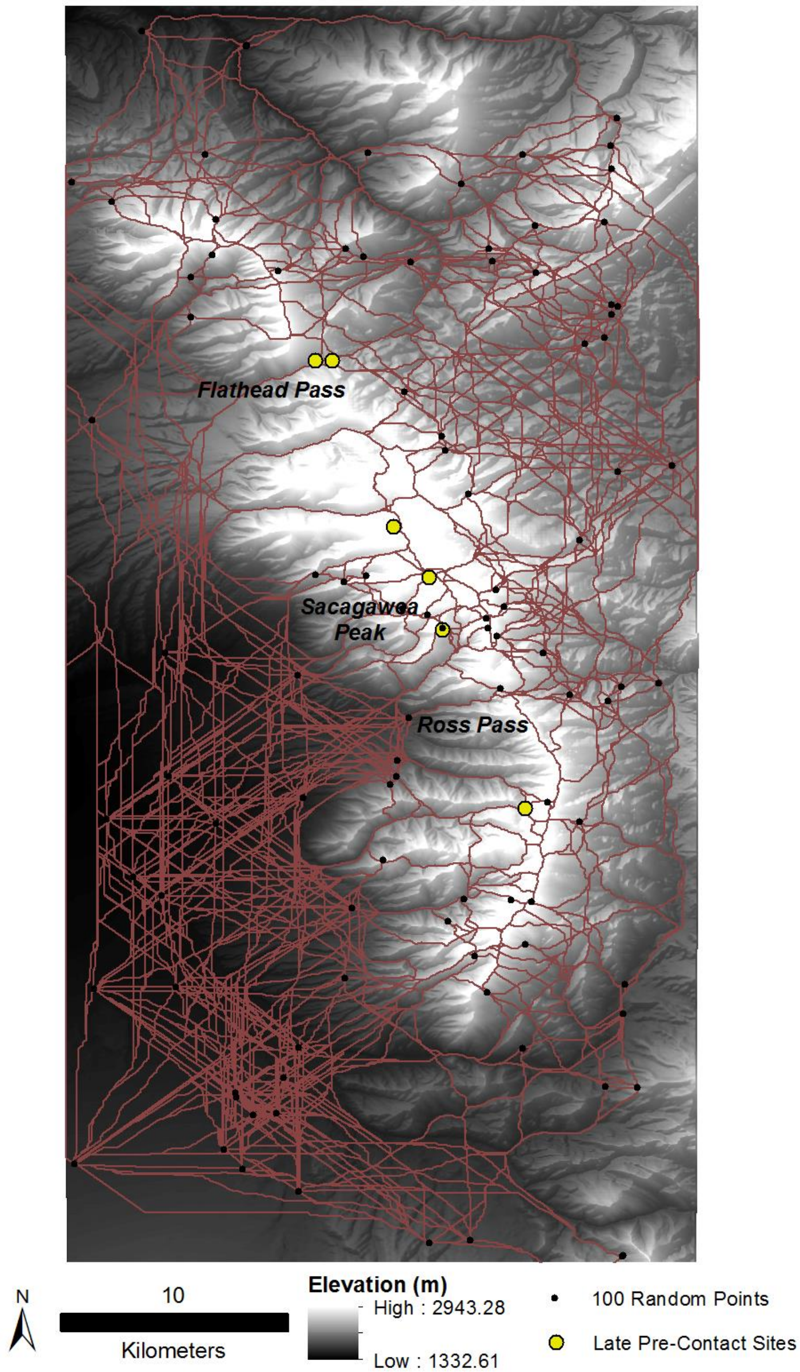


Figure 6.19. Map of the sites with Late Pre-Contact sites overlaid onto the FETE least-cost paths.

Table 6.20. Distances from sites with Late Pre-Contact projectile points to the nearest FETE least-cost paths.

Site Name	Site No.	Known Travel Corridor?	Distance to FETE Least-Cost Paths (m)
Flathead Pass	24GA0303	Flathead Pass	111.7
Rocky Mountain Road	24GA1669	Flathead Pass	153.7
B16	24GA0648	No	217.3
Corbly Basin, Cabin Meadow	24GA0641	Sacagawea Peak	12.1
Limestone Meadow	24GA1672	Sacagawea Peak and Ross Pass	48.6
Bostwick Meadow	24GA1633	No	24.3

Summary of Analysis Results for the Late Pre-Contact Period

The four analyses conducted on the *espaces* and *tours* from the Late Pre-Contact Period suggest that people created a composite landscape of material and symbolic resources. Evenness index scores of sites with Late Pre-Contact projectile points align with other secondary, logistical camps, where people practiced activities relating to resource procurement and (or) domestic tasks. Late Pre-Contact-era people chose site locations that had previously been occupied, with few exceptions, either perhaps because the climate stayed the same from the Late Archaic until the present day or because of other symbolic motivations. There were no overlapping viewsheds of features in the Bridger Mountains, suggesting people did not select sites to view specific mountain place-markers. Because the Late Pre-Contact sites fell along the FETE least-cost paths, the *tours* created in this period were efficient and tied to a resource landscape. Based on these results, I suggest that people in the Late Pre-Contact Period created a composite landscape of resources and symbolism.

Summary

I have presented the results of the four analyses used to determine what types of socialized landscapes people created in the Bridger Mountains. These results, when taken together, suggest that people created a resource-socialized landscape in the Paleoindian Period and composite socialized landscapes, containing valued resources and symbolic place-markers in the Early and Middle Archaic, Late Archaic, and Late Pre-Contact Periods.

Chapter 7: Discussion and Conclusion

My findings show that we can identify socialized landscapes in the Bridger Mountains and that these landscapes were similar over time. Based on the expectations established in Chapter 3 (Table 3.1), I suggest that people in the Paleoindian Period created a resource-socialized landscape in the mountains. Site function analysis indicates that sites functioned as secondary, logistical camps. The site locations correspond to whitebark pine open forests in the Late Paleoindian Period and to modeled efficient routes through the mountains. Groups of people living at this time did not select specific landscape features to view from sites in the mountains. When compared to the previous research in the Bridger Mountains, people who created this resource-socialized landscape may have targeted the whitebark pine nuts that Byers and his colleagues (2003) mention, or other resources such as navigable, efficient routes through the mountains (i.e., the *tours* themselves). However, as Byers et al. (2003) note, any symbolic actions that may have taken place during this period are not discernable with the data and analyses available from the mountains at this time. Simply because we cannot see such practices in the material record available does not mean they did not occur. However, without evidence of such actions, we can only "see" that people structured their socialized landscape to take advantage of the resources they wanted.

The analyses for the nine Early and Middle Archaic Period locations indicate that people living during these times created a composite socialized landscape based on my archaeological expectations. They created eight secondary camps and one specialized task camp overlooking no clearly discernible geographic feature as *espaces* along efficient *tours*, presumably to take advantage of the open forests of whitebark pine in the subalpine basins and traversable routes over the mountains. During this time, people both created new *espaces* within the Douglas fir parkland and also reoccupied locations used in the Paleoindian Period and located near the travel corridor between Sacagawea and Ross Peaks. This creation of *tours* and *espaces* in the same places meets my expectations for place-markers on a symbolic landscape. Recreating and creating *espaces* in these places along the travel *tours* suggests that the *tours* themselves were place-markers, as were the nearby *espaces* at sites such as Corbly Basin Cabin Meadow (24GA0641) and Limestone Meadow (24GA1672). In fact, Snead (2009) described how paths often become meaningful places through reuse, and I suggest this phenomenon occurred during the Early and Middle Archaic *tours* in the Bridger Mountains. Because of the creation of travel *tours* over older paths and *espaces* on older sites as well as the utilization of available resources in the mountains, I suggest that the people in the Early and Middle Archaic Periods created a composite landscape of resources and symbolism.

Results from the Late Archaic Period, when compared to my archaeological expectations, suggest that the Late Archaic groups intensified their socializing of the landscape as a composite landscape through their ten *espaces* and efficient *tours*, where people largely traveled across and dwelt in the mountains to procure resources along known paths. For the most part, the *espaces* people created still fall within the range of secondary campsites, with viewsheds that do not appear to target a particular focal feature. However, there are a few exceptions. Schafer Canyon 1 (24GA1641) at 2,305 m asl and located nearly 1 km from a modeled efficient path and has a unique northwest viewshed – a view that is uncommon for sites in the Bridger Mountains. Archaeologists have previously noted that some pictographs from Blacktail Cave (24GA0301) likely date to the Late Archaic Period, creating a symbolic *espace* on the landscape. Blacktail Cave is located in an area of the mountains that shows little evidence for past *espaces* from any time period, except for this rock art site and few small undated lithic scatters. The lack of evidence may be due to less systematic survey in the area, but it could also indicate that people avoided Blacktail Mountain for any number of potential reasons. The elements of a symbolic landscape are also present in the same travel corridor *tours* that people created and maintained in previous periods at Flathead Pass and between Sacagawea and Ross Peaks. Between *espaces* that may have served symbolic purposes and *tours* that served as place-markers for travel, I conclude that people in the Late Archaic socialized a composite landscape in the Bridger Mountains.

Finally, I suggest that, like their immediate predecessors, the Late Pre-Contact people also created a composite socialized landscape in the Bridger Mountains. Although this time period lasted as long as the Late Archaic, Late Pre-Contact people used the Bridger Mountains less intensively than their predecessors. Groups of people used the majority of the mountains as a resource landscape. They established secondary camp *espaces* in the same locations as the Late Archaic Period to take advantage of both material resources and the travel corridor *tour* place-markers. In this period, the archaeological data can be augmented with ethnographic accounts and historical records. Oral histories indicate that people did visit the Bridger Mountains to procure resources during the Late Pre-Contact Period. For example, Apsalooké (Crow) visited Fairy Lake to harvest medicinal plants (Byers et al. 2003). With regard to the symbolic landscape, Lewis's and Clark's written documents describe Flathead Pass as having a significant path over it, used by both bison and people (Byers et al. 2003). Such a trail must have been an important place-marker, as defined by several archaeologists (e.g., Oetelaar and Oetelaar 2011; Scheiber 2015; Snead 2009), if Lewis and Clark took the time to record it. People also continued to use Blacktail Cave in this period, based on the presence of trade beads at the site (Niven 1959; Napton 1966). The function and location of the sites, including Blacktail Cave, as well as the presence of *tours* as place-markers indicates that people in the Late Pre-Contact created a composite landscape in the Bridger Mountains.

Broader Implications for Bridger Mountain and Rocky Mountain Archaeology

These conclusions provide a richer picture of how people socialized the Bridger Mountain landscape in the past than we previously had. In many ways, the results complement what Byers and his colleagues (2003) described: a landscape rich in resources that Pre-Contact groups regularly used. Although it is difficult to assess the specific resources used without faunal remains or residue analyses, it does seem likely that people minimally targeted whitebark pine nuts, because the trees occured at the same elevations as the sites for many of the time periods. Similarly, because none of the projectile points I examined were made of the local Bridger Silicified Siltstone (BSS), I agree with Byers et al. (2003) and Neeley (2012) that the local raw material was likely not a primary motivation for people to travel into the mountains. However, it was a resource that people certainly utilized, as the entirety of the site assemblage from the Corbly-Limestone Divide site (24GA1759) consisted of debitage and utilized flakes made from BSS, with the exception of the Hanna projectile point.

My results also show the importance of the travel corridor *tours* to the socialized landscapes in the Bridger Mountains. People consistently created and maintained these *tours* over time, and as result, the *tours* became place-markers, as indicated by the sites that people reoccupied along those *tours*. Emphasizing the travel corridors does not detract from the other resources the mountains offered, but the *tours* indicate a landscape used largely for its resources that also held symbolic importance for people. Moreover, these findings are consistent with discussions of paths and trails in the archaeological literature as significant *espaces* in and of themselves (e.g., Oetelaar and Oetelaar 2011; Snead 2009; Zedeño et al. 2009).

Whether the results reveal a resource or composite landscape, the underlying implication is that Pre-Contact people exercised their agency and crafted these landscape types through their practices. They also show that resource landscapes can include features, such as place-marker *tours* and rock art sites, that signify symbolic or refuge landscapes. Because *espaces* are reflected in the lithic archaeological record as the product of people's practices, we can recognize the ways they socialized their world. We could use this methodology to enrich discussions of socialized landscapes throughout the Rocky Mountains, particularly for those landscapes representing deep time, for which oral traditions are unavailable.

Suggestions for Improvement

These results, although a useful start, leave much room for improvement in future studies. Creating a landscape typology based on Scheiber's (2015) original four tropes resulted overly black and white interpretations of complex, past socialized landscapes. Although it did provide a framework in which to begin discussing socialized landscapes, it does not effectively recognize the interconnectedness between targeted resources and symbolic actions, grounded in a cultural worldview. Instead, based on the results, I suggest it would be more useful in the future to construct a spectrum of socialized landscapes grounded in concepts from de Certeau's (1984) "Spatial Stories."

Limiting the scale of the research to the western slopes of the Bridger Mountains also created a study area that was too small to fully evaluate landscape socialization. Archaeologists have long noted scalar problems with the archaeological record, and they hold for the Bridger Mountain analysis. Viewshed studies indicated that views to the southwest over the Gallatin Valley were consistently present throughout each period. However, because I limited myself to a portion of the Bridger Mountains due to previous survey extents and the scope of this thesis, I could not identify specific features that people may have chosen to view from those *espaces*. A larger geographic scale that incorporates different types of landscapes, in addition to the mountain slopes, would help mitigate such problems.

The evenness index I used to identify site function also presented three challenges. First, although the evenness index did provide a means to quantify site function, it was also indeed sensitive to sample size, as Chatters (1987) experienced. His solution to the problem was to pair the index scores with data from the faunal remains at his sites to more fully interpret site function. In the mountains, where faunal and floral remains are rare, I suggest supplementing the tool evenness index scores with any animal or plant remains found in excavated contexts as well as results from residue analyses. Such analyses can detect what types of plants and animals people processed with their tools (e.g., Kooyman et al. 1992; Wadley et al. 2004), which would add another indicator of site function to the evenness index. It would also, of course, reveal what specific types of resources people used, information that continues to be rare, relatively speaking, for Rocky Mountain sites. Second, the evenness index thresholds for site types, created from the histogram of evenness index scores, was also unable to distinguish subtle differences between site function because of the lack of tight chronological control over the assemblage. Basing these site type ranges on excavated assemblages and first-hand analysis of the tools themselves should eliminate such problems in the future. Finally, it is possible that Pielou's (1966) evenness index is not the best measure of diversity for lithic tool types, especially when considering how that diversity impacts archaeologists' designations of site types. There are a number of ways to calculate diversity: through other evenness measures, such as Shannon's H, through richness measures, such as rarefaction, or both, such as Simpson's D and E. Given the high frequency of sites one must confront when conducting socialized landscape analyses, I suggest that a diversity measure paired with Binford's (1980) forager-collector spectrum as Chatters (1987) did is still a useful tool for comparing artifact type diversity across multiple sites. However, I suggest testing these other diversity measures as well to determine which might be most useful for identifying site types.

Finally, although surface artifact scatters are the most common types of sites in the mountains, and we must consider them in studies of socialized landscapes, they present the chronological challenge of establishing contemporaneity. Projectile point types offer one of the very few ways to date a surface lithic scatter, but the resulting time frames of these "index fossils" do not allow for fine-grained chronological control of sites and, thus, examinations of the archaeological record. The Late Archaic and Late Pre-Contact Periods were the tightest time frames with which I worked, and even those lasted about 1,500 years. In the future, to complement the coarser dates from the projectile points, I suggest incorporating and, ideally, relying largely on excavated sites, especially those with radiocarbon or other reliable absolute dates. Well dated sites would allow for the examination of more narrow windows of time and, in turn, a finer-grained analysis of the socialized landscapes. However, I realize that for many areas of the Rocky Mountains, where archaeologists have not yet conducted systematic surveys, let alone excavations, studies of socialized landscapes will have to wait until we have richer data sets with which to work. Nonetheless, each of these suggested changes to the theoretical framework, study prerequisites, and analytical methods would aid in the identification and discussion of socialized landscapes throughout the Rocky Mountains.

Conclusions

While living in Bozeman, I socialized the Bridger Mountains into my larger conception of the Northern Rocky Mountains as a symbolic landscape, representing memories and an escape from city life in the valley. Just as I socialized those mountains, I recognized, as many scholars have before me, that other people in the past must have done the same. Archaeologists, working across the world and in various time frames, have tried to understand how Pre-Contact people dwelt in their landscapes and made those landscapes meaningful to them. One approach to this question has been to use de Certeau's (1984) *espaces* and *tours* on what I have called a "socialized landscape." Such landscapes emerge from people's practices within the bounds of the material and cultural world in which they live. This theory of socialized landscapes has the potential to contribute to our understanding of Rocky Mountain landscapes because it allows the archaeologist to examine the remains of those practices – the archaeological record – and consider the meanings behind occupants' actions.

My research question asked what types of socialized landscapes are visible in the Rocky Mountains using a lithic-heavy archaeological record. I addressed this question by creating a set of archaeological expectations based on Scheiber's (2015) mountain landscape tropes to identify six different landscape types: resource, symbolic, wilderness, refuge, recreation, or composite landscapes. To assess the utility of these expectations, I used the Bridger Mountains as a pilot study area and conducted a four analyses of site assemblages and locations to determine which landscapes can be identified.

The results revealed that Pre-Contact people created different socialized landscapes in the Bridger Mountains during different time periods. Paleoindian groups created a resource-socialized landscape, based on evidence about the site functions, viewsheds, and locations relative to contemporary climate and modeled efficient paths. In contrast, the following Early Archaic through the Late Pre-Contact Periods had composite landscapes of resources and symbolic place-markers from travel corridor *tours* that cross the mountain range. By identifying the *tours* as place-markers on the landscape and recognizing the symbolic aspects of the landscape by time period, the results have contributed to a more nuanced understanding of how past people dwelt in the Bridger Mountains, because they were previously interpreted largely as a resource patch. They also show promise for contributing to discussions of socialized landscapes elsewhere in the Rocky Mountains as well as other hunter-gatherer landscapes, particularly where oral traditions from descendant communities cannot be confidently applied to interpretations of the archaeological record.

The results also revealed a need to improve the theoretical framework, prerequisites, and methods used to apply my expectations for socialized landscape identification to a given landscape. First, a reconfiguration of the theoretical framework as a spectrum of landscapes rather than rigid set of types will allow for more nuanced interpretations and discussions of socialized landscapes. Second, a larger geographic scale will produce more robust results than I achieved on the western slopes of the Bridger Mountains. Third, pairing evenness index scores with additional data from residue analysis could mitigate concerns of small sample size when identifying site function. Finally, dates from excavated contexts will provide better chronological control than sites dated exclusively using projectile point typologies.

As for myself, I intend to continue this line of research, inspired by the Bridger Mountains, to identify and interpret socialized landscapes in the Rocky Mountains. Such studies will take into account the lessons learned from the Bridger Mountain study to include a larger landscape than previously considered and one with that includes excavated sites. Until that time, this study has shown it is possible to identify and discuss socialized landscapes in the Bridger Mountains of Montana, opening the door to expand these studies throughout the Rocky Mountains and beyond.

References

Agogino, George A. and Al Parrish
1971 The Fowler-Parrish Site: A Folsom Campsite in Eastern Colorado. *Plains Anthropologist* 16(52): 111-114.

Allen, Walter E.
1989 Blacktail Caves, A Pictograph Site in Southwest Montana. Paper presented at the 47th Annual Plains Anthropological Conference, Lawrence, Kansas.

Anschuetz, Kurt F., Richard H. Wilshusen, and Cherie L. Scheick
2001 An Archaeology of Landscapes: Perspectives and Directions. *Journal of Archaeological Research* 9(2): 157-211.

Ashmore, Wendy
2002 Decisions and Dispositions: Socializing Spatial Archaeology. *American Anthropologist* 104(4): 1172-1183.

Aston, M. and T. Rowley
1974 *Landscape Archaeology: An Introduction to Fieldwork and Techniques on Post-Roman Landscapes.* David and Charles, Newton Abbot.

Barrett, John C. and Ilhong Ko
2009 A Phenomenology of Landscape: A Crisis in British Landscape Archaeology? *Journal of Social Archaeology* 9(3):275–294.

Basso, Keith H.
1996 Wisdom Sits in Places: Notes on a Western Apache Landscape. In *Senses of Place*, edited by Steven Feld and Keith H. Basso, pp. 53-90. School of American Research Press, Santa Fe.

Benedict, James B.
1974 Early Occupation of the Caribou Lake Site, Colorado Front Range. *Plains Anthropologist* 19(63): 1-4.

Benes, James Victor
2016 Paleoecological Reconstruction of the Bridger Range, Montana, USA. Unpublished M.A. thesis, Department of Earth Sciences, Montana State University.

Bernadini, Wesley, Alicia Barnash, Mark Kumler, and Martin Wong
2013 Quantifying Visual Prominence in Social Landscapes. *Journal of Archaeological Science* 40: 3946-3954.

Binford, Lewis

1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1): 4-20.

Bird-David, Nurit

1990 The Giving Enviroment: Another Perspective on the Economic System of Gatherer-Hunters. *Current Anthropology* 31(2): 189-196.

Bourdieu, Pierre

1977 *Outline of a Theory of Practice*. University of Cambridge Press, Cambridge.

Brace, G. Ian

2005 *Boulder Monuments of Saskatchewan*. Saskatchewan Archaeological Society, Saskatoon.

Bradley, Bruce A.

1993 Paleo-Indian Flaked Stone Technology in the North American High Plains. In *From Kostenki to Clovis: Upper Paleolithic – Paleo-Indian Adaptions*, edited by O. Soffer and N. D. Praslov, pp. 251-262. Plenum Press, New York.

Bradley, Richard

2000 *An Archaeology of Natural Places*. Routledge, New York.

Branting, Scott

2012 Seven Solutions for Seven Problems with Least Cost Pathways. In *Least Cost Analysis of Social Landscapes: Archaeological Case Studies*, edited by D. A. White and S. L. Surface-Evans, pp. 209-224. University of Utah Press, Salt Lake City.

Brück, Joe

2005 Experiencing the Past? The Development of Phenomenological Archaeology in British Prehistory. *Archaeological Dialogues* 12(1): 47-72.

Brumm, Adam

2010 'Falling Sky': Symbolic and Cosmological Associations of the Mt. William Greenstone Axe Quarry, Central Victoria, Australia. *Cambridge Archaeological Journal* 20(2): 179-196.

Brunswig, Robert H.

2007 New Interpretations of the Dent Mammoth Site: A Synthesis of Recent Multidisciplinary Evidence. In *Frontiers in Colorado Paleoindian Archaeology: From the Dent Site to the Rocky Mountains*, edited by Robert H. Brunswig and Bonnie L. Pitblado, pp. 87-122. University of Colorado Press, Denver.

Byers, David A. and Andrew Ugan
2005 Should We Expect Large Game Specialization in the Late Pleistocene? An Optimal Foraging Perspective on Early Paleoindian Prey Choice. *Journal of Archaeological Science* 32: 1624-1640.

Byers, David A., Walter Allen, and John W. Fisher, Jr.
2003 Investigations in the Bridger Mountain Range, Montana: A Backyard Archaeology Project. In *Islands on the Plains: Ecological, Social, and Ritual Use of Landscapes*, edited by Marcel Kornfeld and Alan J. Osborn, pp. 142-166. University of Utah Press, Salt Lake City.

Carpenter, Scott L. and Phillip R. Fisher
2014 From Cliff to Cache: Analysis of a Middle Archaic Obsidian Cache from Southwestern Montana. In *Lithics in the West: Using Lithic Analysis to Solve Archaeological Problems in Western North America*, edited by D. H. MacDonald and P. Yu, pp, 171-191. University of Montana Press, Missoula.

Casey, Edward S.
1996 How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena. In *Senses of Place*, edited by S. Feld and K. H. Basso, pp. 13-52. School of American Research Press, Santa Fe.

Chatters, James
1987 Hunter-Gatherer Adaptions and Assemblage Structure. *Journal of Anthropological Archaeology* 6: 336-375.

Clarkson, Chris
2008 Lithics and Landscape Archaeology. In *Handbook of Landscape Archaeology*, edited by B. David and J. Thomas, pp. 490-501. Left Coast Press, Inc., Walnut Creek, CA.

Conolly, James and Mark Lake
2006 Introduction and Theoretical Issues in Archaeological GIS. In *Cambridge Manuals in Archaeology: Geographic Information Systems in Archaeology*, pp. 1-10. University of Cambridge, Cambridge.

Criado Boado, F. and V. V. Vasquez
2000 Monumentalising Landscape: From Present Perception to the Past Meaning of Galician Methalithism (North-West Iberian Peninsula). *European Journal of Archaeology* 3: 188-216.

Crumley, Carole L. and William H. Marquardt
1990 Landscape: A Unifying Concept in Regional Analysis. In *Interpreting Space: GIS and Archaeology*, edited by K. M. S. Allen, S. W. Green and E. B. W. Zubrow, pp. 73-79. Taylor & Francis, Bristol, PA.

David, Bruno and Julian Thomas
2008 Landscape Archaeology: Introduction. In *Handbook of Landscape Archaeology*, eds. B. David and J. Thomas, pp. 27-43. Left Coast Press, Inc., Walnut Creek, CA.

Davis, C. E. and H. F. Shovic
1996 *Soil Survey of the Gallatin National Forest, Montana*. U.S. Department of Agriculture, Forest Service and Natural Resources Conservation Service, Bozeman, Montana.

Davis, Carl M. and James D. Keyser
1999 KcKean Complex Projectile Point Typology and Function in the Pine Parklands. *Plains Anthropologist* 44(169): 251-270.

Davis, Leslie B., Stephan A. Aaberg, and Sally T. Greiser
1988 Paleoindians in Transmontane Southwestern Montana: The Barton Gulch Occupations, Ruby River Drainage. *Current Research in the Pleistocene* 5: 9-11.

Davis, Leslie B. and Sally T. Greiser
1992 Indian Creek Paleoindians: Early Occupation of the Elkhorn Mountains' Southeast Flank, West-Central Montana. In *Ice Age Hunters of the Rockies*, edited by D. J. Stanford and J. S. Day, pp. 225-283. University of Colorado Press, Boulder.

Davis, Leslie B. and Charles D. Zeier
1978 Multi-Phase Late Period Bison Procurement at the Antonsen Site, Southwestern Montana. *Plains Anthropologist* 23(82): 222-235.

Davis, Leslie B., John W. Fisher, Jr., Michael C. Wilson, Stephen A. Chomko, and Richard E. Morlan
2000 Avonlea Phase Winter Fare at Lost Terrace, Upper Missouri River Valley of Montana: The Vertebrate Fauna. *Plains Anthropologist, Memoir 32: Pronghorn Past and Present: Archaeology, Ethnography, and Biology* 45(174): 53-69.

Davis, Carl M. and James D. Keyser
1999 KcKean Complex Projectile Point Typology and Function in the Pine Parklands. *Plains Anthropologist* 44(169): 251-270.

de Certeau, Michel
1984 Spatial Stories. In *The Practice of Everyday Life*, translated Steven F. Rendall, pp. 115-130. University of California Press, Berkley, California.

Dixon, James E.
1999 *Bones, Boats, and Bison: Archaeology and the First Colonization of the Western North America*. University of New Mexico, Albuquerque.

Duke, Philip
2008 Places in the Heartland: Landscape Archaeology on the Plains. In *Archaeological Landscapes on the High Plains*, edited by L. L. Scheiber and B. J. Clark, pp. 277-285. University of Colorado Press, Boulder.

Dwyer, Peter D.
1996 The Invention of Nature. In *Redefining Nature: Ecology, Culture, and Domestication*, ed. R. E. Kaysuyoshi Fukui, pp. 157-186. Berg, Oxford.

Fisher, John W., Jr., Meghan J. Dudley, and Bob Donahoe
2015 Geochemical Analysis of Thirty-Four Projectile Points from the Bridger Mountains, Montana. Submitted to Custer-Gallatin National Forest Service. Copies available from U.S. Forest Service, Billings, Montana.

Fleming, Andrew
2006 Post-processual Landscape Archaeology: A Critique. *Cambridge Archaeological Journal* 16(3):267–280.

Francis, Julie E. and Lawrence L. Loendorf
2004 *Ancient Visions: Petroglyphs and Pictographs of the Wind River and Bighorn Country, Wyoming and Montana.* University of Utah Press.

Frison, George C.
1971 The Buffalo Pound in Northwestern Plains Prehistory: Site 48CA302. *American Antiquity* 36(1): 77-91.

1983 The Lookingbill Site, Wyoming, 48FR308. *Tebiwa* 20:1-6.

1984 The Carter/Kerr-McGee Paleoindian Site: Cultural Resource Management and Archaeological Research. *American Antiquity* 49(2): 288-314.

1988 Paleoindian Subsistence and Settlement During Post-Clovis Times on the Northwestern Plains, the Adjacent Mountain Ranges, and Intermontane Basins. In *Indians Before Columbus: Ice-Age Origins*, edited by R. C. Carlisle, pp. 83-106. Ethnology Monographs No. 12, Department of Anthropology, University of Pittsburgh, Pittsburgh.

1992 The Foothill-Mountains and the Open Plains: The Dichotomy in Paleoindian Subsistence Strategies between Two Ecosystems. In *Ice Age Hunters of the Rockies*, pp. 323-342. University of Colorado Press, Boulder.

Frison, George C. and Bruce Bradley
1999 *The Fenn Cache, Clovis Weapons and Tools.* One Horse Land and Cattle Company, Santa Fe, New Mexico.

Frison, George C. and Dennis J. Standford (editors)
1982 *The Agate Basin Site: A Record of the Paleoindian Occupations of the Northwestern High Plains*. Academic Press, New York.

Frison, George C. and Lawrence C. Todd
1986 *The Colby Mammoth Site: Taphonomy and Archaeology of a Clovis Kill Site in Northern Wyoming*. University of New Mexico Press, Albuquerque.

1987 *The Horner Site: The Type Site of the Cody Cultural Complex*. Academic Press, Orlando. (editors)

Frison, George C. and Zola Van Norman
1985 The Wind River Canyon Burial and Cache. *Archaeology in Montana* 26(2): 43-52.

Frison, George C. and Danny N. Walker
1984 The Dead Indian Creek Site: An Archaic Occupation in the Absaroka Mountains of Northwest Wyoming. *The Wyoming Archaeologist* 27(1-2): 11-122.

Frison, George C., Michael Wilson, and Diane J. Wilson
1976 Fossil bison and artifacts from an Early Altithermal Period Arroyo Trap in Wyoming. *American Antiquity* 41(1): 28-57.

Greer, J. and M. Greer
1996 Montana Rock Art: 1996 Field Season. Ms. On file, Gallatin National Forest, Bozeman, Montana.

Gillespie, Jason D.
2007 Enculturing an Unknown World: Caches and Clovis Landscape Ideology. *Canadian Journal of Archaeology* 31: 171-189.

Gillings, Mark
2012 Landscape Phenomenology, GIS, and the Role of Affordance. *Journal of Archaeological Method and Theory* 19: 601-611.

Hawkes, Kristen, Kim Hill, and James F. O'Connell
1982 Why Hunters Gather: Optimal Foraging and the Aché of Eastern Paraguay. *American Ethnologist* 9: 379-398

Haynes, Gary and Jarod M. Hutson
2013 Clovis-Era Subsistence: Regional Variability, Continental Patterning. In *Paleoamerican Odyssey*, edited by K. E. Graf, C. V. Ketron, and M. R. Waters, pp. 293-309. Center for the Study of the First Americans, Texas A&M University, College Station.

Herzog, Irmela
2013 The Potential and Limits of Optimal Path Analysis. In *Computational Approaches to Archaeological Spaces*, edited by A. Bevan and M. Lake, pp. 179-212. Left Coast Press, Inc., Walnut Creek, CA.

Hodder, Ian
1995 The Domestication of Europe. In *Theory and Practice in Archaeology*, edited by Ian Hodder, pp. 241-253. Routledge Press, London.

Holmes, William H.
1914 Areas of American Culture Characterization Tentatively Outlined as an Aid in the Study of the Antiquities. *American Anthropologist* 16: 413-446.

Huckell, Bruce B.
2014 But How Do We Know If It's Clovis: An Examination of Clovis Overshot Flaking Bifaces and a North Dakota Cache. In *Clovis Caches: Recent Discoveries and New Research*, edited by B. B. Huckell and J. D. Kilby, pp.133-152. University of New Mexico Press, Albuquerque.

Hughes, Susan S.
1981 Projectile Point Variability: A Study of Point Curation at a Besant Kill Site in Southcentral Wyoming. Unpublished Master's thesis, Department of Anthropology, University of Wyoming, Laramie.

Hurst, C. T.
1943 A Folsom Site in a Mountain Valley of Colorado. *American Antiquity* 8(3): 250-253.

Husted, Wilfred M. and Robert Edgar
2002 *The Archaeology of Mummy Cave, Wyoming*. United States Department of the Interior National Park Service, Midwest Archaeological Center, Lincoln, Nebraska.

Ingold, Tim
1993 The Temporality of the Landscape. *World Archaeology* 25(2): 152-174.

Ives, Ronald L.
1942 Early Human Occupation of the Colorado Headwaters Region: An Archeological Reconnaissance. *Geographical Review* 32(3): 448-462.

Janetski, Joel
2002 *Indian in Yellowstone National Park*. University of Utah Press, Salt Lake City.

Jodry, Margaret Ann Brierty
1999 Folsom Technological and Socioeconmic Strategies: Views from Stewart's Cattle Guard and the Upper Rio Grande Basin, Colorado. Unpublished Ph.D. dissertation, American University, Washington D.C.

Johnson, Matthew
2010 *Archaeological Theory: An Introduction*. 2nd edition. Blackwell Publishing, Ltd., Oxford.

Johnson, Matthew H.
2007 *Ideas of Landscape*. Blackwell Publishing, Ltd., Oxford.

Jordan, Peter
2003 *Material Culture and Sacred Landscape: The Anthropology of the Siberian Khanty*. Rowman & Littlefield Publishers, Inc., Walnut Creek, California.

Joyce, Arthur A.
2009 The Main Plaza at Monte Alban: A Life History of Place. In *The Archaeology of Meaningful Places*, edited by B. J. Bowser and M. N. Zedeño, pp. 32-52. The University of Utah Press, Salt Lake City.

Kehoe, Thomas F.
1966 The Small Side-Notched Point System of the Northern Plains. *American Antiquity* 31(6): 827-841.

Kelly, Robert L.
2003 Colonization of New Land by Hunter-Gatherers: Expectations and Implications Based on Ethnographic Data. In *Colonization of Unfamiliar Landscapes: The Archaeology of Adaption*, edited by M. Rockman and J. Steele, pp. 44-58. Routledge, New York.

Kelly, Robert L., Todd A. Surovell, Bryan N. Shuman, and Geoffrey M. Smith
2013 A Continuous Climatic Impact on Holocene Human Populations in the Rocky Mountains. *PNAS* 110(2): 443-447.

Keyser, James D. and Michael A. Klassen
2001 *Plains Indian Rock Art*. University of Washington Press, Seattle.

Knell, Edward J. and Mark P. Muñiz (editors)
2013 *Paleoindian Lifeways of the Cody Complex*. University of Utah Press, Salt Lake City.

Knudson, Ruthann
1973 Plains Paleo-Indian. *Bulletin of the Canadian Archaeological Association* (5): 146.

Kooyman, Brian P.
2000 Northern Plains Stone Tool Cultural History. In *Understanding Stone Tools and Archaeological Sites*, pp. 107-127. University of Calgary, Calgary.

Kooyman, Brian, Margaret E. Newman, and Howard Ceri
1992 Verifying the Reliability of Blood Residue Analysis on Archaeological Tools. *Journal of Archaeological Science* 19:265-269.

Kornfeld, Marcel
1999 Clovis in the Rockies: How High Do They Get. Poster paper presented at Clovis and Beyond, sponsored by the Center for the Study of the First Americans. Santa Fe, New Mexico.

Kornfeld, Marcel, George C. Frison, and Mary Lou Larson
2010 *Prehistoric Hunter-Gatherers of the High Plains and Rockies*. 3rd edition. Left Coast Press, Inc., Walnut Creek, California.

Kornfeld, Marcel, Mary Lou Larson, David J. Rapson, and George C. Frison
2001 10,000 Years in the Rocky Mountains: The Helen Lookingbill Site. *Journal of Field Archaeology* 28(3/4): 307-324.

Krell, David Farrell
1977 *Martin Heidegger: Basic Writings from* Being and Time *(1927) to* The Task of Thinking *(1964)*. Harper & Row Publishers, New York.

Livingood, Patrick
2012 No Crows Made Mounds: Do Cost-Distance Calculations of Travel Time Improve Our Understanding of Southern Appalachian Polity Size? In *Least Cost Analyses of Social Landscapes: Archaeological Case Studies*, edited by D. A. White and S. L. Surface-Evans, pp. 174-187. University of Utah Press, Salt Lake City.

Lee, Craig M.
2012 Withering Snow and Ice in the Mid-Latitudes: A New Archaeological and Paleobiological Record for the Rocky Mountain Region. *Arctic* 65: 165-177.

Marshall, A.
1977 *Nez Perce Social Groups: An Ecological Interpretation*. Unpublished Ph.D. dissertation, Department of Anthropology, Washington State University, Pullman.

McCaffrey, Moira
2011 Ancient Social Landscapes in the Eastern Subarctic. In *Hunter-Gatherer Archaeology as Historical Process*, edited by Kenneth E. Sassaman and Donald H. Holly Jr., pp. 187-208. The University of Arizona Press, Tuscon, Arizona.

McCurdy, G.
1997 *Montana Climate Summaries*. Western Regional Climate Center, http://www.wrcc.dri.edu/summary/climsmmt.html, accessed March 15, 2017.

McMannis, William J.
1955 Geology of the Bridger Mountains, Montana. *Bulletin of the Geological Society of America* 66(11): 1385-1430.

Merleau-Ponty, Maurice
1962 *Phenomenology of Perception*. Translated by Colin Smith. Routledge & Kegan Paul, London.

Merriam-Webster
2017 Merriam-Webster Dictionary. Electronic document, https://www.merriam-webster.com/dictionary/wilderness, accessed May 6, 2017.

Metcalf, M. D. and K. D. Black
1997 Archaic Period Logistical Organization in the Colorado Rockies. In *Changing Perspectives of the Archaic on the Northwest Plains and Rocky Mountains*, edited by M. L. Larson and J. E. Francis, pp. 168-209. University of South Dakota Press, Vermillion.

Mirau, Neil A.
1995 Medicine Wheels on the Northern Plains: Contexts, Codes, and Symbols. In *Beyond Subsistence: Plains Archaeology and the Postprocessual Critique*, edited by P. Duke and M. C. Wilson, pp. 193-210. The University of Alabama Press, Tuscaloosa.

Napton, Lewis Kyle
1966 Canyon and Valley: Preliminary Archaeological Survey in the Gallatin Valley, Montana. Unpublished M.A. thesis, Department of Anthropology, University of Montana, Missoula.

Neeley, Michael P. and Amy Denton
2012 Raw Material Variability and Mobility Patterns from the Wright Site in Southwestern Montana. Paper presented at the Montana Archaeological Society Conference, Montana.

Nelson Nels C.
1916 Chronology of the Tano Ruins, New Mexico. *American Anthropologist* 18: 159-180.

Niven, Francis
1959 Blacktail Mountain Caves. *Archaeology in Montana* 1(3): 5-7.

Oetelaar, Gerald A. and D. Joy Oetelaar
2011 The Structured World of the *Niitsitapi*: The Landscape as Historical Archive among Hunter-Gatherers of the Northern Plains. In *Structured Worlds: The Archaeology of Hunter-Gatherer Thought and Action*, edited by A. Cannon, pp. 69-94. Equinox, Sheffield.

Pac, D. F., R. J. Mackie, and H. E. Jorgensen
1991 *Mule Deer Population Organization, Behavior, and Dynamics in a Northern Rocky Mountain Environment*, Montana Department of Fish Wildlife, and Parks, Bozeman.

Peck, Trevor R.
2011 *Light from Ancient Campfires: Archaeological Evidence for Native Lifeways on the Northern Plains*. Athabasca University Press, Edmonton, Alberta.

Peck, Trevor R. and John W. Ives
2001 Late Side-Notched Projectile Points in the Northern Plains. *Plains Anthropologist* 46(176): 163-193.

Peterson, Michael R.
2008 Prehistoric Settlement Patterns on the High Plains of Western Nebraska and the Use of Geographic Information Systems for Landscape Analyses. In *Archaeological Landscapes on the High Plains*, edited by L. L. Scheiber and B. J. Clark, pp. 237-276. University of Colorado Press, Boulder.

Pfister, R. D., B. L. Kovalchik, S. F. Arno, and R. C. Presby
1977 *Forest Habitat Types of Montana*. U.S. Forest Service, Department of Agriculture, Ogden, Utah.

Phillips, Shawn M. and Phillip O. Leckman
2012 Wandering the Desert: Least Cost Path Modeling for Water Transport Trails in the Jornada Mogollon Region, Fort Bliss, South-Central New Mexico. In *Least Cost Analyses of Social Landscapes: Archaeological Case Studies*, edited by D. A. White and S. L. Surface-Evans, pp. 46-66. University of Utah, Salt Lake City.

Pielou, E. C.
1966 The Measurement of Diversity in Different Types of Biological Collections. *Journal of Theoretical Ecology* 13: 131-144.

Pitblado, Bonnie L.
2003 *Late Paleoindian Occupations of the Southern Rocky Mountains: Early Holocene Projectile Points and Land Use in the High Country*. University of Colorado Press, Denver.

2007 Angostura, Jimmy Allen, Foothills-Mountain. In *Frontiers in Colorado Paleoindian Archaeology: From the Dent Site to the Rocky Mountains*, edited by Robert H. Brunswig and Bonnie L. Pitblado, pp. 311-337. University of Colorado Press, Denver.

2017 The Role of the Rocky Mountains in the Peopling of the New World. *Quaternary International*, in press.

Randall, Asa R.
2015 *Constructing Histories: Archaic Freshwater Shell Mounds and Social Landscapes of the St. Johns River, Florida*. University of Florida Press, Gainesville.

Rasmussen, Morten, Sarah L. Anzick, Michael R. Waters, Pontus Skoglund, Michael DeGiorgio, Thomas W. Stafford Jr., Simon Rasmussen, Ida Moltke, Anders Albrechtsen, Shane M. Doyle, G. David Poznik, Valborg Gudmundsdottir, Rachita Yadav, Anna-Sapfo Malaspinas, Samuel Stockton White V, Morten E. Allentoft, Omar E. Cornejo, Kristiina Tambets, Anders Eriksson, Peter D. Heintzman, Monika Karmin, Thorfinn Sand Korneliussen, David J. Meltzer, Tracey L. Pierre, Jesper Stenderup, Lauri Saag, Vera M. Warmuth, Margarida C. Lopes, Ripan S. Malhi, Søren Brunak, Thomas Sicheritz-Ponten, Ian Barnes, Matthew Collins, Ludovic Orlando, Francois Balloux, Andrea Manica, Ramneek Gupta, Mait Metspalu, Carlos D. Bustamante, Mattias Jakobsson, Rasmus Nielsen, and Eske Willerslev
2014 The Genome of a Late Pleistocene Human from a Clovis Burial Site in Western Montana. *Nature* 506: 225-229.

Reeves, Brian O. K.
1978 Head-Smashed-In: 5500 Years of Bison Jumping in the Alberta Plains. In *Bison Procurement and Utilization: A Symposium*, edited by L. B. Davis and M. Wilson, pp. 151-174. Plains Anthropological Memoir 14. Lincoln, Nebraska.

1983 *Culture Change in the Northern Plains: 1000 B.C.-A.D. 1000*. Archaeological Survey of Alberta, Occasional Paper No. 20.

Robin, Cynthia
2002 Outside of Houses: The Practices of Everyday Life at Chan Noohol, Belize. *Journal of Social Archaeology* 2(2): 245-268.

Sassaman, Kenneth E.
2011 History and Alterity in the Eastern Archaic. In *Hunter-Gatherer Archaeology as Historical Process*, edited by Kenneth E. Sassaman and Donald H. Holly, Jr., pp. 187-208. University of Arizona Press, Tuscon.

Scheiber, Laura L.
2015 Paths, Places, and Positions: Exploring Rocky Mountain Landscapes as Resource, Symbol, Wilderness, and Refuge. In *Engineering Mountain Landscapes: An Anthropology of Social Investment*, edited by L. L. Scheiber and M. N. Zedeño, pp. 23-48. University of Utah Press, Salt Lake City.

Scheiber, Laura L. and Judson Byrd Finley
2011 Mobility as Resistance: Colonialism among Nomadic Hunter-Gatherers in the American West. In *Hunter-Gatherer Archaeology as Historical Process*, edited by Kenneth E. Sassaman and Donald H. Holly Jr., pp. 187-208. The University of Arizona Press, Tuscon, Arizona.

Scott, Sara A., Carl M. Davis, Karen L. Steelman, Marvin W. Rowe, and Tom Guilderson
2005 AMS Dates from Four Late Prehistoric Period Rock Art Sites in West Central Montana. *Plains Anthropologist* 50(193): 57-71.

Sewell, William H., Jr.
1992 A Theory of Structure: Duality, Agency, and Transformation. *American Journal of Sociology* 98:1-29.

Simpson, J. H.
1984 Population Dynamics of Mule Deer. In *The Dead Indian Creek Site: An Archaic Occupation in the Absaroka Mountains of Northwestern Wyoming*, edited by G. C. Frison and D. N. Walker. *The Wyoming Archaeologist* 27(1-2): 83-96.

Smith, Eric Alden
1983 Anthropological Applications of Optimal Foraging Theory: A Critical Review. *Current Anthropology* 24(5): 625-651.

Snead, James E.
2008 History, Place, and Social Power in the Galisteo Basin, A.D. 1250-1325. In *The Social Construction of Communities*, edited by M. D. Varien and J. M. Potter, pp. 155-167. Rowman & Littlefield Publishers, Inc. Lanham, MD.

2009 Trails of Tradition: Movement, Meaning, and Place. In *Landscapes of Movement: Ttrails, Paths, and Road in Anthropological Perspective*, edited by J. E. Snead, C. L. Erickson, J. A. Darling, pp. 42-60. University of Pennsylvania Press, Philadelphia.

Stewart, J. H.
1938 *Basin-Plateau Aboriginal Sociopolitical Groups*. Bureau of American Ethnology Bulletin No. 120. Washington, D.C.

Tilley, Christopher
1994 *A Phenomenology of Landscape: Places, Paths, and Monuments*. Berg, Oxford.

2010 *Interpreting Landscapes: Geologies, Topographies, Identities, Explorations in Landscape Phenomenology 3*. Left Coast Press, Inc., Walnut Creek, California.

Trigger, Bruce G.
2006 *A History of Archaeological Thought*. 2nd edition. University of Cambridge Press, Cambridge.

Vogel, Gregory
2005 *A View from the Bottomlands: Physical and Social Landscapes and Late Prehistoric Mound Centers in Northern Caddo Area*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Arkansas, Fayetteville.

Wadley, Lyn, Marlize Lombard, and Bonny Williamson
2004 The First Residue Blind Tests: Results and Lessons Learnt. *Journal of Archaeological Science* 31:1491-1501.

Waguespack, Nicole M. and Todd A. Surovell
2003 Clovis Hunting Strategies, or How to Make out on Plentiful Resources. *American Antiquity* 68(2): 333-352.

Walker, Danny N.
1982 Early Holocene Vertebrate Fauna. In *The Agate Bain Site: A Record of the Paleoindian Occupation of the Northwestern Plains*, edited by G. C. Frison and D. Stanford, pp. 274-308. Academic Press, New York.

White, Devin A. and Sarah B. Barber
2012 Geospatial Modeling of Pedestrian Transportation Networks: A Case Study from Precolumbian Oaxaca, Mexico. *Journal of Archaeological Science* 39: 2684-2696.

Wilke, Philip J., J. Jeffrey Flennniken, and Terry L. Ozbun
1991 Clovis Technology at the Anzick Site, Montana. *Journal of California and Great Basin Anthropology* 13(2): 242-272.

Wilson, Michael C.
2005 The “Placing” of Identity in Nomadic Societies: Aboriginal Landscapes of the Northwestern Plains of North America. *Material History Review* 62: 7-19.

Wormington, H. Marie
1939 *Ancient Man in North America*. Popular Series No. 4 Denver Museum of Natural History, Denver.

1948 A Proposed Revision of the Yuma Point Terminology. *Proceedings*, Colorado Museum of Natural History, Vol. 18, No. 2.

Wormington, H. M. and Richard G. Forbis
1965 *An Introduction to the Archaeology of Alberta, Canada*. Proceedings No. 11. Denver Museum of Natural History, Denver.

Wylie, Alison
1985 The Reaction against Analogy. *Advances in Archaeological Method and Theory* 8: 63-111.

Zedeño, María Nieves
2015 Central Places in the Backcountry: The Archaeology and Ethnography of Beaver Lake, Montana. In *Engineering Mountain Landscapes: An Anthropology of Social Investment*, edited by L. L. Scheiber and M. N. Zedeño, pp. 7-22. University of Utah Press, Salt Lake City.

Zedeño, M. N., K. L. Hollenback, and C. Grinnel
2009 "From Path to Myth: Journeys and the Naturalization of Territorial Identity Along the Missouri River." In *Landscapes of Movement: Trails, Paths, and Roads in Anthropological Perspective*, edited by J. E. Snead, C. L. Erickson, and J. A. Darling, pp. 106-132. University of Pennsylvania Press, Philadelphia.

Zedeño, María Nieves, Jesse A. M. Ballenger, and John R. Murray
2014 Landscape Engineering and Organizational Complexity among Late Prehistoric Bison Hunters of the Northwestern Plains. *Current Anthropology* 55(1): 23-58.

Appendix A: The Current Environment of the Bridger Mountains

The current environment in the Bridger Mountains is divided into five distinct ecozones by elevation. Each ecozone and its associated flora and fauna are described in Table A.1.

Table A.1. Five modern ecozones in the Bridger Mountains by elevation and associated floral and faunal species (Davis and Shovic 1996; Pfister et al. 1977).

Ecozone Name	Elevation Range (m asl)	Flora	Fauna
Shrub-grassland and open-growth forest	Below 1,675	Bluebunch wheatgrass (*Agropyron spicatum*); Idaho fescue (*Festuca idahoensis*); juniper (*Juniperus commonis*); sagebrush (*Artemisia tridentata*); Douglas fir (*Pseudotsuga menziesii*); limber pine (*Pinus flexilis*)	White-tailed deer (*Odocoileus virginianus*); mule deer (*Odocoileus hemionus*); wapiti or elk (*Cervus elaphus*); moose (*Alces alces*); black bear (*Ursus americanus*); mountain lion (*Felis puma*); yellow-bellied marmot (*Marmota flaviventris*)
Dense lodgepole and Douglas fir forests	1,675-2,195	Lodgepole pine (*Pinus contorta*); Douglas fir (*Pseudotsuga menziesii*); pinegrass (*Calamagrostis rubescens*); bluebunch wheatgrass (*Agropyron spicatum*); Idaho fescue (*Festuca idahoensis*); thin-leafed huckleberry (*Vaccinium globulare*); common snowberry (*Symphoricarpos albus*); gooseberry (*Ribes*)	Mule deer (*Odocoileus hemionus*); wapiti or elk (*Cervus elaphus*); moose (*Alces alces*); black bear (*Ursus americanus*); mountain lion (*Felis puma*); yellow-bellied marmot (*Marmota flaviventris*)
Lower subalpine forest	2,195-2,500	White-bark pine (*Pinus albicaulis*); subalpine fir (*Abies lasiocarpa*); Engelmann spruce (*Picea engelmann*); grouse whortleberry (*Vaccinium scoparium*); Idaho fescue (*Festuca idahoensis*); forbs, such as meadow rue (*Thalictrum occidentale*), yellow columbine (*Aquilegia flavescens*), and Hayden clover (*Trifolium haydenii*)	Mule deer (*Odocoileus hemionus*); wapiti or elk (*Cervus elaphus*); moose (*Alces alces*); black bear (*Ursus americanus*); mountain lion (*Felis puma*); yellow-bellied marmot (*Marmota flaviventris*)

Ecozone Name	Elevation Range (m asl)	Flora	Fauna
Upper subalpine forest	2,500-2,650	White-bark pine (*Pinus albicaulis*); subalpine fir (*Abies lasiocarpa*); Engelmann spruce (*Picea engelmann*); grouse whortleberry (*Vaccinium scoparium*); Idaho fescue (*Festuca idahoensis*); forbs, such as meadow rue (*Thalictrum occidentale*), yellow columbine (*Aquilegia flavescens*), and Hayden clover (*Trifolium haydenii*)	Mule deer (*Odocoileus hemionus*); wapiti or elk (*Cervus elaphus*); moose (*Alces alces*); black bear (*Ursus americanus*); mountain lion (*Felis puma*); yellow-bellied marmot (*Marmota flaviventris*)
Timberline forest	2,650-2,750	White-bark pine (*Pinus albicaulis*); subalpine fir (*Abies lasiocarpa*); Engelmann spruce (*Picea engelmann*); grouse whortleberry (*Vaccinium scoparium*); Idaho fescue (*Festuca idahoensis*); forbs, such as meadow rue (*Thalictrum occidentale*), yellow columbine (*Aquilegia flavescens*), and Hayden clover (*Trifolium haydenii*)	Mule deer (*Odocoileus hemionus*); wapiti or elk (*Cervus elaphus*); moose (*Alces alces*); black bear (*Ursus americanus*); mountain lion (*Felis puma*); yellow-bellied marmot (*Marmota flaviventris*)

Appendix B: Lithic Coding Guides

Because I wanted to ensure my data would be comparable with Fisher's original database, I relied on coding guides for projectile point and lithic tools created by Fisher and Roll to analyze the projectile points and lithic tools from the Bridger Mountains. Those original coding guides are displayed below, with the artifact coding guide first and the projectile point guide second.

Bridger Mountains

J. Fisher, T. Roll, & C. Bauer 6-29-94 Artifact Data E:\WPDOCS\ULM\ARTCODE.WP

ULM PISHKUN (24CA1012)
CODEBOOK for ARTIFACT DATA
(except projectile points and pottery)

Designed for use with:

dBaseIV databases **92DATA** and **93DATA**

& Custom Screen **ARTIN** for data entry

1. SITE: 24CA1012 (the site number using the Smithsonian trinomial numbering system)
2. AREA: the designation for the appropriate arbitrary Area within the **site**; e.g. DN, DS, EN, ES, and so forth
3. UNIT: the appropriate excavation unit designation
4. LEVEL: the **arbitrary** level (Roman numeral)
5. LAYER: the **natural** layer (arabic numeral); if excavated in arbitrary levels then there is no layer designation, and vice versa
6. NUMBER: the number for an indiviual specimen, assigned sequentially within a level or layer

7. CAT: (category)
   - ART? (= not sure that the specimen is an artifact)
   - BONE (= bone artifact)
   - LITHIC (= stone artifact)
   - NONART (= non-artifact)
   - OTHART (= other category of artifact, not specified by other choices)

8. CLASS:
   - ART (= specimen is an artifact, but not a tool)
   - ART? (= specimen might be an artifact)
   - FCR (= specimen is a piece of fire-cracked rock or fire-broken rock)
   - PEB (= specimen is a pebble)
   - TOOL (= projectile point, biface, knife, scraper, etc.)
   - TOOL? (specimen might be a tool)
   - ~~OTH (= specimen is a lithic, but not a flake nor a tool nor a~~

9. DES: (description)
BEAD (= bead)
BF (= biface)
CART (= cartridge for a firearm)
CORE (= core)
ESCRP (= end-scraper)
HST (= hammerstone)
OCHRE (= ochre)
OTH (= other)
PP (= projectile point)
SCR (= scraper)
SSCR (= side-scraper)
UNF (= uniface)
COBSCR = cobble scraper
MURF = minimally utilized retouched flake

FRAG = indeterminate fragment (e.g., glass shard) metal, wire, plastic)
STAP = fence staple
NAIL = metal nail
CHAIN = chain link
KNF = knife
GRV = graver
PST = pestal
DRL = drill
SPK - SPOKE SHAVER
Beak - BK
Burin - BRN
Point Preform - PFM

10. PORTION: BAS = base
COM = complete
MID = midsection fragment
OBL = fragment, oblique break (diagonal)
OTH = other type of fragment (not specified in this list)
SAG = fragment, sagittal (longitudinal) fracture
TIP = tip fragment

11. TYPE:

12. NORTH: northing coordinates, measured in centimeters to the nearest whole centimeter
13. EAST: easting coordinates, measured in centimeters to the nearest whole centimeter
14. ELEV: elevation (e.g. 98.75); an entry of 0.0 signifies that the item was found in the screen; do not enter depth below datum or depth below surface
15. SCREEN?: (was item found in screen? i.e. no provenience coordinates)
T = yes
F = no
16. EXC: (excavator) excavators' initials
17. DATE: date excavated
18. CATBY: cataloged by
19. CATDAT: date cataloged

20. MATERIAL: ARG = argillite
CCS = crypto-crystalline silica
GLASS = glass
METAL = metal
OBS = obsidian

BULLET = BULLET
JUG = JUG
~~shotgun bullet casing~~ = casing
~~Glass fragments~~ = glass
cigarette butts = cigbut
cork = cork
metal can = can
- Historical Art

2

PWD = PETRIFIED WOOD

QAR - quartz granite

MATERIAL (cont'd)
OTH = other (indeterminate)
PLASTIC = plastic
QZ = quartz
QZ-C = crystalline quartz (quartz crystal)
QZT = quartzite
POR = porcellanite
POR-G = porcellanite, gray
POR-R = porcellanite, red
BAS = basalt
SLS = siliceous siltstone
TRS = Tongue River silicified sediment - GREY, SHINY, ALMOST GLASSY LIKE OBSIDIAN
SH = shell
SLL = Silicified limestone
SSD - Silicified Sandstone
SM = silicified marl
SAN = SANDSTONE
AND = ANDESITE

21. LENGTH: maximum length of specimen, in mm to nearest tenth of a mm

22. WIDTH: maximum width of specimen, in mm to nearest tenth of a mm

23. THICKNESS: maximum thickness of specimen, in mm to nearest tenth of a mm

24. WEIGHT: weight of specimen, measured in grams to nearest hundreth of a gram (e.g. 18.56 g)

25. EDGE ANGLE: angle (measured in degrees) of edge; rounded off to nearest 5 degrees

26. RTCHPAT: retouch pattern (see illustration)
1 = RANDOM
2 = PARALLEL STRAIGHT
3 = PARALLEL DESCENDING

27. RTCHPEN: retouch penetration (see illustration)
1 = MARGINAL
2 = INVASIVE
3 = COLLATERAL
4 = TRANSVERSE

28. XSECT: cross section (see illustration)
1 = PLANO-CONVEX
2 = PLANO-CONCAVE
3 = BI-PLANO
4 = BI-CONVEX
5 = BI-CONCAVE
6 = CONCAVO-CONVEX

29. NOTES: notes or comments about the specimen

Bridger Mountains

ULM PISHKUN (24CA1012)

Codebook for Projectile Point Data
Designed for use with:
dBaseIV databases **92DATA** and **93DATA**
& Custom Screen **PPOINT** for data entry

1. SITE: 24CA1012 (the site number using the Smithsonian trinomial numbering system)
2. AREA: the designation for the appropriate arbitrary Area within the site; e.g. DN, DS, EN, ES, and so forth
3. UNIT: the appropriate excavation unit designation
4. LEVEL: the arbitrary level (Roman numeral)
5. LAYER: the natural layer (arabic numeral); if excavated in arbitrary levels then there is no layer designation, and vice versa
6. DEPTH: top and bottom elevations for level or layer
7. NUMBER: the number for an indiviual specimen, assigned sequentially within a level or layer
8. LOTNUM: the number for a group (lot) of specimens
9. NOINLOT: the count of individual specimens in the lot
10. CAT: (category) LITHIC (= stone)
11. CLASS: TOOL (= projectile point, biface, knife, scraper, etc.)
12. DES: (designation) PP (= projectile point) STM = stemmed
13. TYPE: UN = un-notched SN = side-notched CN = corner-notched TN = tri-notched IN = indeterminate DSN = Double-notch LN = lanceolate CR = corner-removed
14. PORTION: BAS = base
    COM = complete
    ALM = almost complete (specify in "Notes")
    PFM = preform
    MID = midsection fragment
    OBL = fragment, oblique break (diagonal)
    OTH = other type of fragment (not specified in this list)
    SAG = fragment, sagittal (longitudinal) fracture
    TIP = tip fragment
15. TAXON:
16. NORTH: northing coordinates, measured in centimeters to the nearest whole centimeter
17. SOUTH: southern coordinates, measured in centimeters to the nearest whole centimeter
18. EAST: easting coordinates, measured in centimeters to the nearest whole centimeter
19. WEST: westing coordinates, measured in centimeters to the nearest whole centimeter
20. ELEV: elevation (e.g. 98.75); an entry of 0.0 signifies that the item was found in the screen; **do not** enter **depth below datum** or **depth below surface**
21. EXC: (excavator) excavators' initials
22. DATE: date excavated
23. CATBY: cataloged by
24. CATDAT: date cataloged
25. NOTES: notes or comments about the specimen

QAR=quartz argnite
slate - SLT

26. MATERIAL:	ARG = argillite CCS = crypto-crystalline silica OBS = obsidian OTH = other (indeterminate) QZT = quartzite QZ = quartz QZ-C = crystalline quartz (quartz crystal) POR = porcellanite POR-G = porcellanite, gray POR-R = porcellanite, red BAS = basalt SLS = siliceous siltstone TRS = Tongue River silicified sediment SLL = Silicified limestone SM = silicified marl
27. LENGTH:	maximum length of projectile point from tip to base, in mm to nearest tenth; see illustration for landmarks
28. WIDTH:	maximum width of projectile point, in mm to nearest tenth; see illustration for landmarks
29. THICKNESS:	maximum thickness, in mm to nearest tenth
30. WEIGHT:	weight of projectile point, measured in grams to nearest hundreth (e.g. 18.56 g)
31. BLDWD:	(blade width) maximum width of projectile point blades, in mm to nearest tenth; see illustration for landmarks
32. BLADELENR:	(blade length right) length of right blade, side is chosen arbitrarily; in mm to nearest tenth; see BL on illustration
33. BLADELENL:	(blade length left) length of left blade; see BL on illustration
34. BASLENR:	base length, right, side is chosen arbitrarily; see BSL on illustration
35. BASLENL:	(base length, left side); see BSL on illustration
36. NTCHWDR:	(notch width, right side) width of right notch; see NW on illustration
37. NTCHWDL:	(notch width, left side) width of left notch; see NW on illustration
38. NTCHDPR:	(notch depth, right side) depth of right notch; see ND on illustration
39. NTCHDPL:	(notch depth, left side) depth of left notch; see ND on illustration
40. BASWD:	base width; see BSW on illustration
41. HFTWD:	hafting width
42. BSCONWD:	basal concavity width; see BCW on illustration
43. BSCONDP:	basal concavity depth; see BCD on illustration
44. OUTLINE:	1 = LEAF (see illustration) 2 = LANCEOLATE 3a, 3b, 3c = TRIANGULAR 4 = OVAL

DAC= dacite

45. BLDSHP: blade shape (see illustration)
1 = STRAIGHT
2 = INCURVATE
3 = EXCURVATE
4 = PARALLEL EXCURVATE
5 = CONTRACTING EXCURVATE
6 = RECURVED

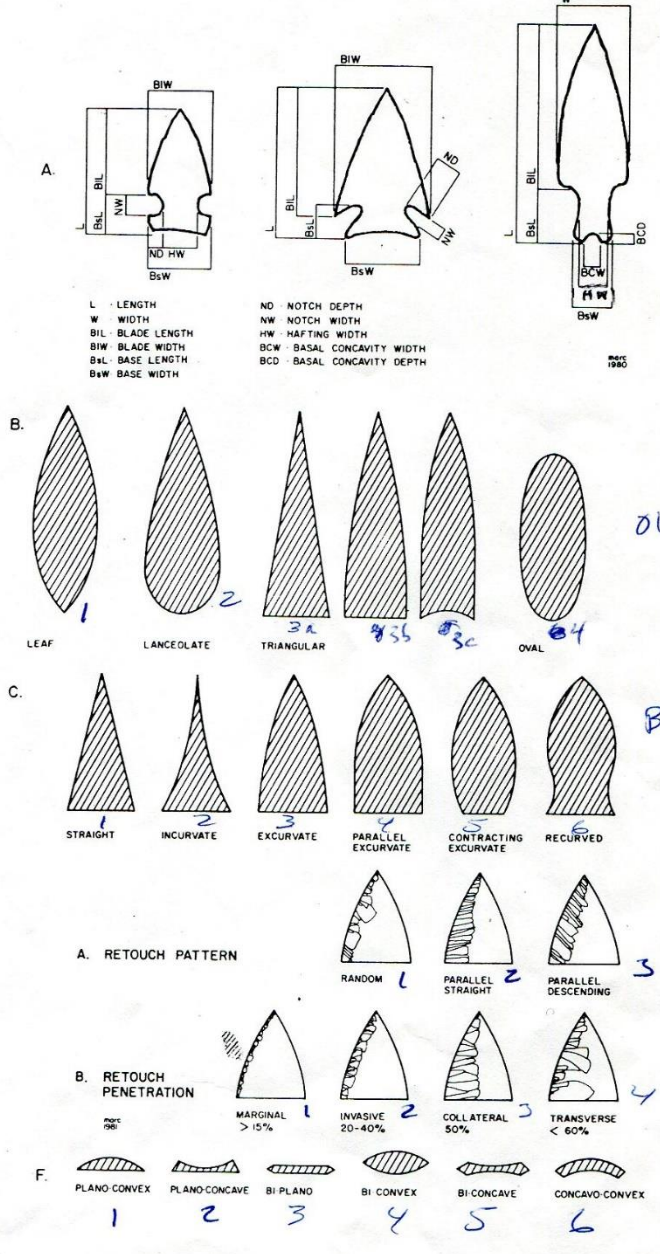
46. RTCHPAT: retouch pattern (see illustration)
1 = RANDOM
2 = PARALLEL STRAIGHT
3 = PARALLEL DESCENDING

47. RTCHPEN: retouch penetration (see illustration)
1 = MARGINAL
2 = INVASIVE
3 = COLLATERAL
4 = TRANSVERSE

48. XSECT: cross section (see illustration)
1 = PLANO-CONVEX
2 = PLANO-CONCAVE
3 = BI-PLANO
4 = BI-CONVEX
5 = BI-CONCAVE
6 = CONCAVO-CONVEX

49. BSFRMOD: basal form modification

50. GRIND: grinding; if present = yes, if not present = no


A.
BlW
BlL
BsL
NW
L
ND HW
BsW
ND
BCD
BCW
HW
W
L · LENGTH
W · WIDTH
BlL · BLADE LENGTH
BlW · BLADE WIDTH
BsL · BASE LENGTH
BsW · BASE WIDTH
ND · NOTCH DEPTH
NW · NOTCH WIDTH
HW · HAFTING WIDTH
BCW · BASAL CONCAVITY WIDTH
BCD · BASAL CONCAVITY DEPTH
marc 1980
B.
LEAF
LANCEOLATE
TRIANGULAR
OVAL
C.
STRAIGHT
INCURVATE
EXCURVATE
PARALLEL EXCURVATE
CONTRACTING EXCURVATE
RECURVED
A. RETOUCH PATTERN
RANDOM
PARALLEL STRAIGHT
PARALLEL DESCENDING
B. RETOUCH PENETRATION
marc 1981
MARGINAL > 15%
INVASIVE 20-40%
COLLATERAL 50%
TRANSVERSE < 60%
F.
PLANO-CONVEX
PLANO-CONCAVE
BI-PLANO
BI-CONVEX
BI-CONCAVE
CONCAVO-CONVEX

Appendix C: Typed Projectile Points

Here, I provide images and data collected on the projectile points I typed from the Bridger Mountains, Montana. First, I provide a table with basic data (quantified measurements excluded), followed by the pictures the points themselves.

Appendix Table C.1. Table of all typed points by site. Figure numbers are listed with each point for the images of the points that follow the table.

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
3	24GA0303	Flathead Pass	Flathead Pass	Clovis	IMG_7603-7608,	Early Paleoindian	Dacite	Cashman	C.1
5	24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Angostura	PaleoPoint1, DCSN0488-0491, IMG 7573-7575	Late Paleoindian	Chert	N/A	C.2
19	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Agate Basin	IMG_6562-6564	Late Paleoindian	Chert	N/A	C.3
63	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Agate Basin or Angostura	IMG_7321-7323	Late Paleoindian	Dacite	Cashman	C.4
81	24GA0641	Corbly Basin, Cabin Meadow, East	Corbly Gulch	Hawken	IMG_7396-7398	Early Archaic	Dacite	Cashman	C.5
7	24GA0645	Limestone	Limestone	Duncan	IMG_7615-7617	Middle Archaic	Dacite	Cashman	C.6
17	24GA0645	Limestone	Limestone	Oxbow	IMG_7588-7590	Middle Archaic	Dacite	N/A	C.7
60	24GA1633	Bostwick Meadow (BSD2)	Bostwick Canyon	Duncan	IMG_7072-7074	Middle Archaic	Dacite	Unknown A	C.8

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
24	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Duncan or Hanna	IMG_6589-6591	Middle Archaic	Chert	N/A	C.9
25	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Duncan or Hanna	IMG_6592-6594	Middle Archaic	Chert	N/A	C.10
40	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Oxbow	IMG_6685-6687	Middle Archaic	Dacite	N/A	C.11
82	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Oxbow	IMG_6580-6582	Middle Archaic	Chert	N/A	C.12
28	24GA1646	North Cottonwood, North Fork, Upper Site	North Cottonwood	Duncan or Hanna	IMG_6595-6597	Middle Archaic	Obsidian	N/A	C.13
37	24GA1666	North Cottonwood, at Fork of North & South Forks	North Cottonwood	Duncan	IMG_7306-7308	Middle Archaic	Obsidian	Obsidian Cliff	C.14
105	24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	Tom Reese Creek	Oxbow	IMG_7528	Middle Archaic	Chert	N/A	C.15

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
106	24GA1671	Tom Reese Creek, BD-1, North End of Upper Bowl	Tom Reese Creek	Oxbow	IMG_7525-7527	Middle Archaic	Chert	N/A	C.16
122	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Oxbow	IMG_7372-7374	Middle Archaic	Chert	N/A	C.17
66	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Oxbox	IMG_7336-7338	Middle Archaic	Dacite	Unknown A	C.18
113	24GA1759	Corbly Gulch-Limestone Divide	N/A	Hanna	IMG_7492-7474	Middle Archaic	Chert	N/A	C.19
14	24GA0303	Flathead Pass	Flathead Pass	Besant	IMG_7591-7593	Late Archaic	Dacite	Cashman	C.20
15	24GA0303	Flathead Pass	Flathead Pass	Besant	IMG_7594-7596	Late Archaic	Chert	N/A	C.21
51	24GA0303	Flathead Pass	Flathead Pass	Pelican Lake	IMG_7480-7482	Late Archaic	Obsidian	Bear Gulch	C.22
107	24GA0303	Flathead Pass	Flathead Pass	Pelican Lake	IMG_7477-7479	Late Archaic	Chert	NA	C.23
108	24GA0303	Flathead Pass	Flathead Pass	Pelican Lake	IMG_7474-7476	Late Archaic	Chert	NA	C.24
9	24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Besant	IMG_7582-7585	Late Archaic	Dacite	N/A	C.25
10	24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Pelican Lake	IMG_7576-7578	Late Archaic	Dacite	Unknown A	C.26

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
11	24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Pelican Lake	N/A	Late Archaic	Dacite	N/A	N/A
12	24GA0641	Corbly Basin, Cabin Meadow	Corbly Gulch	Pelican Lake	IMG_7570-7572	Late Archaic	Chert	N/A	C.27
52	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_8518-8520	Late Archaic	Obsidian	Bear Gulch	C.28
73	24GA0641	Corbly Gulch, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_7417-7419	Late Archaic	Dacite	Unknown B	C.29
78	24GA0641	Corbly Basin, Cabin Meadow, East	Corbly Gulch	Pelican Lake	IMG_7408-7410	Late Archaic	Dacite	Unknown A	C.30
79	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_7438-7440	Late Archaic	Dacite	N/A	C.31
80	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Besant	IMG_7429-7431	Late Archaic	Dacite	N/A	C.32
126	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_7393-7395	Late Archaic	Chert	N/A	C.33
130	24GA0641	Corbly Gulch, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_7420-7422	Late Archaic	Chert	N/A	C.34

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
132	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Pelican Lake	IMG_7432-7437	Late Archaic	Chert	N/A	C.35
77	24GA0641	Corbly Basin, Area C, Above Sandstone Cliff	Corbly Gulch	Pelican Lake	IMG_7450-7452	Late Archaic	Dacite	N/A	C.36
42	24GA0645	Upper Dry Canyon	Dry Creek	Besant	No picture	Late Archaic	Dacite	N/A	N/A
99	24GA0645	Upper Dry Canyon	Dry Creek	Besant	IMG_7535-7537	Late Archaic	Chert	N/A	C.37
100	24GA0645	Limestone Meadow	Limestone	Pelican Lake	IMG_7531-7533	Late Archaic	Chert	N/A	C.38
13	24GA0648	Site B16	North Cottonwood	Besant	IMG_7585-7587	Late Archaic	Chert	N/A	C.39
50	24GA1065	Tom Reese Creek, B18	Tom Reese Creek	Pelican Lake	No picture	Late Archaic	Dacite	Cashman	N/A
61	24GA1633	Bostwick Meadow (BSD2)	Bostwick	Besant	IMG_7075-7077	Late Archaic	Dacite	Unknown B	C.40
111	24GA1633	Bostwick Meadow	Bostwick	Pelican Lake	IMG_7081-7083	Late Archaic	Chert	N/A	C.41
29	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6568-6570	Late Archaic	Dacite	N/A	C.42

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
30	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6571-6573	Late Archaic	Obsidian	Obsidian Cliff	C.43
31	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6583-6585	Late Archaic	Obsidan	Obsidian Cliff	C.44
32	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6598-6603	Late Archaic	Dacite	Cashman	C.45
33	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Besant	IMG_6625-6630	Late Archaic	Obsidian	Bear Gulch	C.46
35	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6646-6648	Late Archaic	Obsidian	N/A	C.47
36	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6649-6651	Late Archaic	Obsidian	Obsidian Cliff	C.48
38	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Besant, Corner Removed	IMG_6652-6657	Late Archaic	Dacite	N/A	C.49

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
39	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Besant	IMG_6658-6663	Late Archaic	Dacite	Unknown A	C.50
83	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Besant	IMG_6565-6567	Late Archaic	Chert	N/A	C.51
84	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6577-6579	Late Archaic	Chert	N/A	C.52
85	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6586-6588	Late Archaic	Chert	N/A	C.53
87	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6622-6624	Late Archaic	Chert	N/A	C.54
88	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6617-6621	Late Archaic	Chert	N/A	C.55
89	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6613-6615	Late Archaic	Chert	N/A	C.56

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
90	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6610-6612	Late Archaic	Chert	N/A	C.57
91	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6604-6609	Late Archaic	Quartzite	N/A	C.58
92	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6631-6636	Late Archaic	Chert	N/A	C.59
93	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6637-6641	Late Archaic	Chert	N/A	C.60
94	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Besant	IMG_6643-6645	Late Archaic	Dacite	Cashman	C.61
97	24GA1634	North Cottonwood, North Fork, Main Camp	North Cottonwood	Pelican Lake	IMG_6574-6576	Late Archaic	Chert	N/A	C.62
98	24GA1637	Limestone Trail, IF 10	Limestone	Pelican Lake	IMG_7540-7542	Late Archaic	Chert	N/A	C.63
102	24GA1641	Schafer Canyon 1	Schafer Canyon	Besant	IMG_7546-7548	Late Archaic	Dacite	N/A	C.64
118	24GA1672	Limestone Canyon, First	Limestone	Pelican Lake	IMG_7363-7365	Late Archaic	Chert	N/A	C.65

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
		Upper Meadow							
119	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Besant	IMG_7369-7371	Late Archaic	Chert	N/A	C.66
120	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Besant	IMG_7366-7368	Late Archaic	Chert	N/A	C.67
121	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Pelican Lake	IMG_7351-7353	Late Archaic	Chert	N/A	C.68
67	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Pelican Lake	IMG_7345	Late Archaic	Dacite	Cashman	C.69
68	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Pelican Lake	IMG_7348-7350	Late Archaic	Obsidian	Obsidian Cliff	C.70
69	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Pelican Lake	IMG_7360-7362	Late Archaic	Obsidian	Bear Gulch	C.71

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
70	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Pelican Lake	IMG_7357-7359	Late Archaic	Dacite	Unknown A	C.72
72	24GA1672	Limestone Canyon, First Upper Meadow (BSD15/16)	Limestone	Besant	IMG_7381-7383	Late Archaic	Dacite	N/A	C.73
16	24GA0303	Flathead Pass	Flathead Pass	Avonlea	IMG_7597-7599	Late Pre-Contact	Chert	N/A	C.74
57	24GA0303	Flathead Pass	Flathead Pass	Tri-notch	IMG_7462-7464	Late Pre-Contact	Obsidian	NA	C.75
101	24GA0303	Flathead Pass	Flathead Pass	Avonlea	IMG_7483-7485	Late Pre-Contact	Chert	NA	C.76
112	24GA0303	Flathead Pass	Flathead Pass	Avonlea	IMG_7471-7473	Late Pre-Contact	Chert	NA	C.77
53	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Tri-notch	IMG_8527-8529	Late Pre-Contact	Obsidian	Obsidian Cliff	C.78
129	24GA0641	Corbly Basin, Cabin Meadow, West	Corbly Gulch	Corner notched arrow point	IMG_7414-7416	Late Pre-Contact	Chert	N/A	C.79
34	24GA0648	B17, Area A	North Cottonwood	Corner notched arrow point	IMG_7315-7317	Late Pre-Contact	Obsidian	N/A	C.80
109	24GA1633	Bostwick Meadow	Bostwick	Avonlea	IMG_7069-7071	Late Pre-Contact	Chert	Hyalite	C.81

Database ID	Site No.	Site Name	Drainage	Projectile Point Type	Photo No.	Time Period	Material	Raw Material Source	Figure No.
49	24GA1669	Flathead Pass, Rocky Mountain Road	Flathead Pass	Plains Side Notch	IMG_7507-7509	Late Pre-Contact	Obsidian	N/A	C.82
117	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Avonlea	IMG_7342-7344	Late Pre-Contact	Chert	N/A	C.83
124	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Avonlea	IMG_7387-7389	Late Pre-Contact	Chert	N/A	C.84
125	24GA1672	Limestone Canyon, First Upper Meadow	Limestone	Plains Side Notch	IMG_7384-7386	Late Pre-Contact	Chert	N/A	C.85

Figure C.1. Clovis projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.2. Angostura projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.3. Agate Basin projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher).

Figure C.4. Agate Basin or Angostura projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.5. Hawken projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

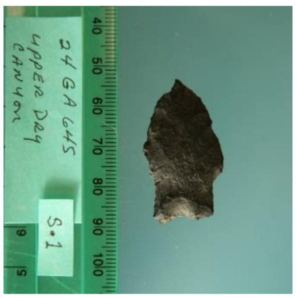


Figure C.6. Duncan projectile point from Limestone (24GA0645). (Courtesy of Jack Fisher)

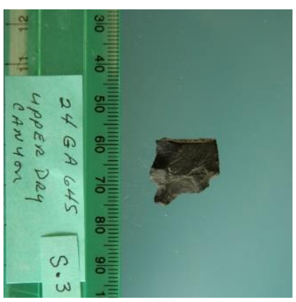


Figure C.7. Oxbow projectile point from Limestone (24GA0645). (Courtesy of Jack Fisher)

Figure C.8. Duncan projectile point from Bostwick Meadow (24GA1633). (Courtesy of Jack Fisher)

Figure C.9. Duncan or Hanna projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.10. Duncan or Hanna projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

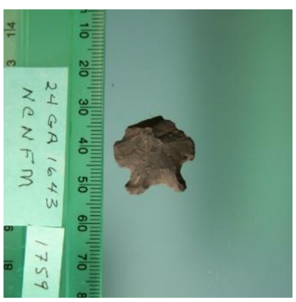


Figure C.11. Oxbow projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.12. Oxbow projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

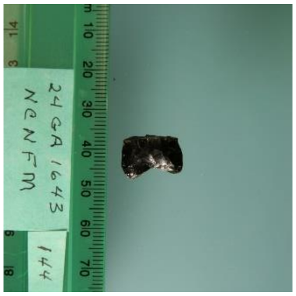


Figure C.13. Duncan or Hanna projectile point from North Cottonwood North Fork site (24GA1646). (Courtesy of Jack Fisher)

Figure C.14. Duncan projectile point from North Cottonwood at the Fork site (24GA1666). (Courtesy of Jack Fisher)

Figure C.15. Oxbow projectile point from Tom Reese Creek site (24GA1671). (Courtesy of Jack Fisher)

Figure C.16. Oxbow projectile point from Tom Reese Creek site (24GA1671). (Courtesy of Jack Fisher)

Figure C.17. Oxbow projectile point from Limestone Canyon site (24GA1672). (Courtesy of Jack Fisher)

Figure C.18. Oxbow projectile point from Limestone Canyon site (24GA1672). (Courtesy of Jack Fisher)

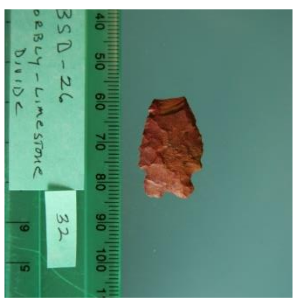


Figure C.19. Oxbow projectile point from Corbly Gulch-Limestone Divide site (24GA1759). (Courtesy of Jack Fisher)

Figure C.20. Besant projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

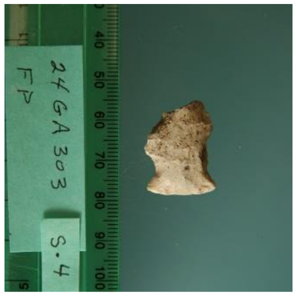


Figure C.21. Besant projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.22. Pelican Lake projectile point from Flathead Pass (24GA0303). Courtesy of Jack Fisher).

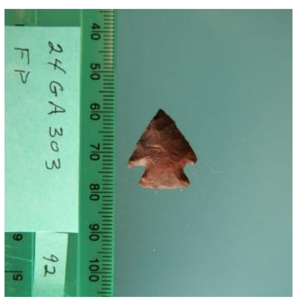


Figure C.23. Pelican Lake projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.24. Pelican Lake projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.25. Besant projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.26. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.27. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

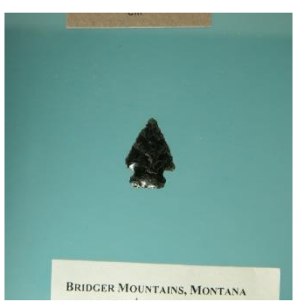


Figure C.28. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.29 Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.30. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.31. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.32. Besant projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

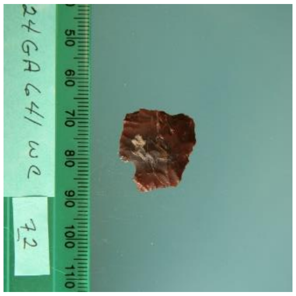


Figure C.33. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.34. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.35. Pelican Lake projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.36. Pelican Lake projectile point from Corbly Basin, Area C (24GA0641). (Courtesy of Jack Fisher)

Figure C.37. Besant projectile point from Upper Dry Canyon (24GA0645). (Courtesy of Jack Fisher)

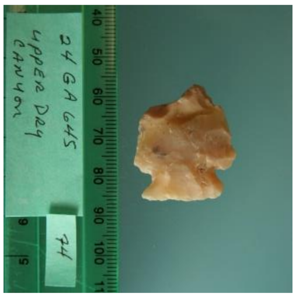


Figure C.38. Pelican Lake projectile point from Upper Dry Canyon (24GA0645). (Courtesy of Jack Fisher)

Figure C.39. Besant projectile point from B16 (24GA0648). (Courtesy of Jack Fisher).

Figure C.40. Besant projectile point from Bostwick Meadow (24GA1633). (Courtesy of Jack Fisher).

Figure C.41. Pelican Lake projectile point from Bostwick Meadow (24GA1633). (Courtesy of Jack Fisher)

Figure C.42. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.43. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

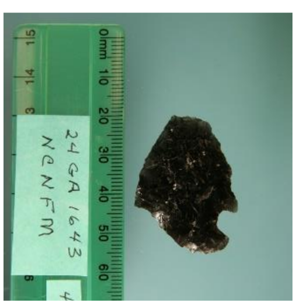


Figure C.44. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.45. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.46. Besant projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.47. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.48. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.49. Besant (corner removed) projectile point type from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.50. Besant projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.51. Besant projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.52. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.53. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

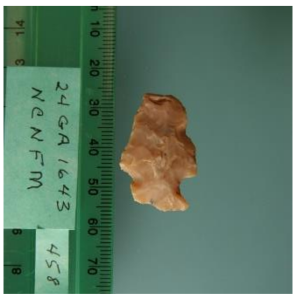


Figure C.54. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

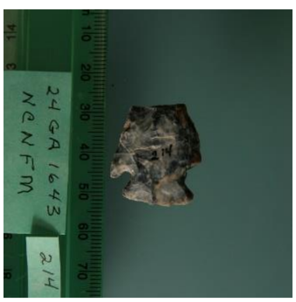


Figure C.55. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.56. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.57. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634).

Figure C.58. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

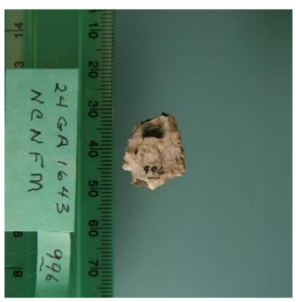


Figure C.59. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.60. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

Figure C.61. Besant projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher).

Figure C.62. Pelican Lake projectile point from North Cottonwood Main Camp (24GA1634). (Courtesy of Jack Fisher)

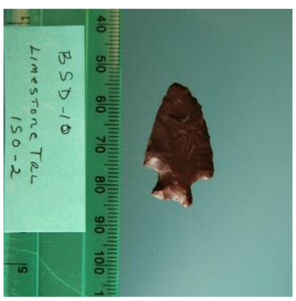


Figure C.63. Pelican Lake projectile point from Limestone Trail (24GA1637). (Courtesy of Jack Fisher)

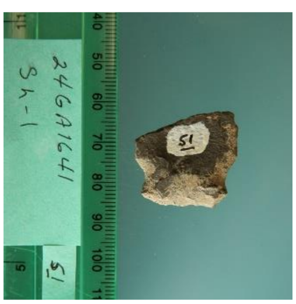


Figure C.64. Besant projectile point from Schafer Canyon (24GA1641). (Courtesy of Jack Fisher

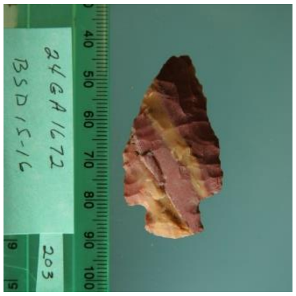


Figure C.65. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

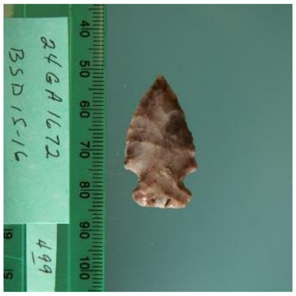


Figure C.66. Besant projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.67. Besant projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

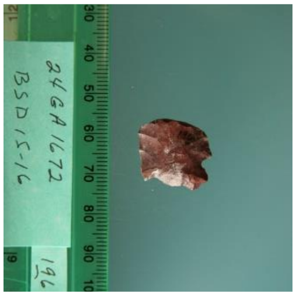


Figure C.68. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.69. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.70. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.71. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

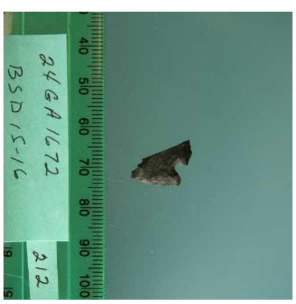


Figure C.72. Pelican Lake projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.73. Besant projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.74. Avonlea projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

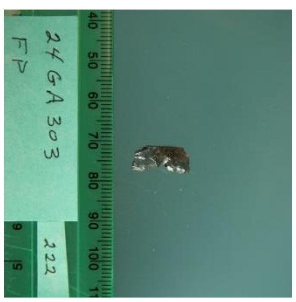


Figure C.75. Tri-notch projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.76. Avonlea projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

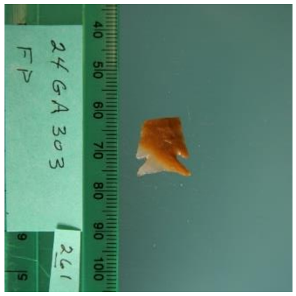


Figure C.77. Avonlea projectile point from Flathead Pass (24GA0303). (Courtesy of Jack Fisher)

Figure C.78. Tri-notch point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.79. Corner-notch projectile point from Corbly Basin, Cabin Meadow (24GA0641). (Courtesy of Jack Fisher)

Figure C.80. Corner-notch projectile point from B17 (24GA0648). (Courtesy of Jack Fisher)

Figure C.81. Avonlea projectile point from Bostwick Meadow (24GA1633). (Courtesy of Jack Fisher)

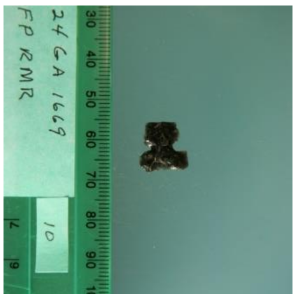


Figure C.82. Plains Side Notch projectile point from the Rocky Mountain Road site (24GA1669). (Courtesy of Jack Fisher)

Figure C.83. Avonlea projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.84. Avonlea projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Figure C.85. Plains Side Notch projectile point from Limestone Canyon (24GA1672). (Courtesy of Jack Fisher)

Appendix D: Tool Type Frequencies at Bridger Mountain Sites

While evenness index scores provide a simple way to compare tool type diversity across multiple sites, the measure is sensitive to sample size. Because of this sensitivity, I have included below bar graphs of tool type frequencies at each of the sites from the Bridger Mountains to complement the evenness index scores reported in Chapter 5. I produced these graphs using data directly from Fisher's original database.

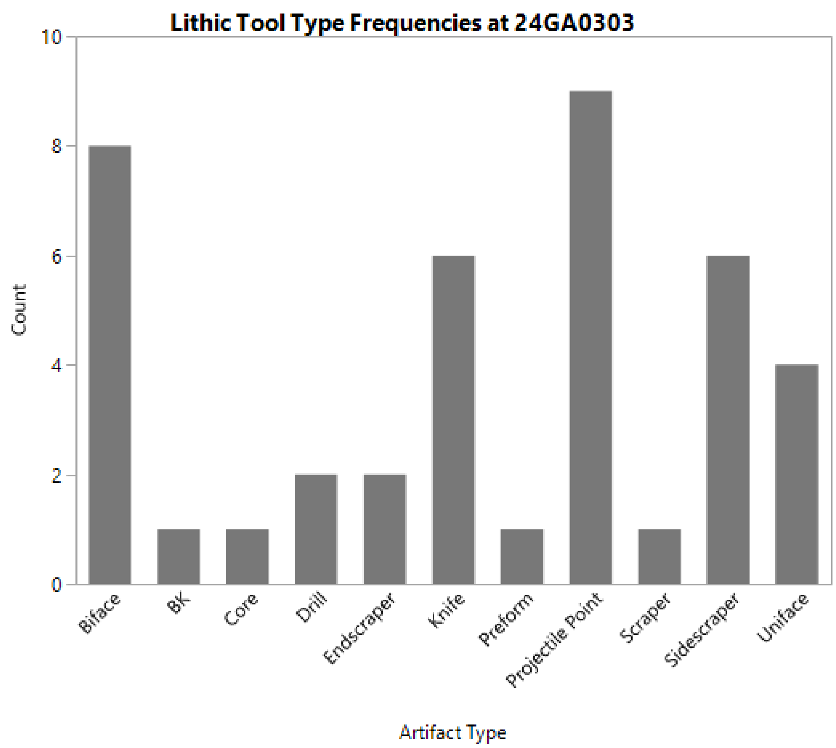


Figure D.1. Tool type frequencies at Flathead Pass (24GA0303) (n = 41).

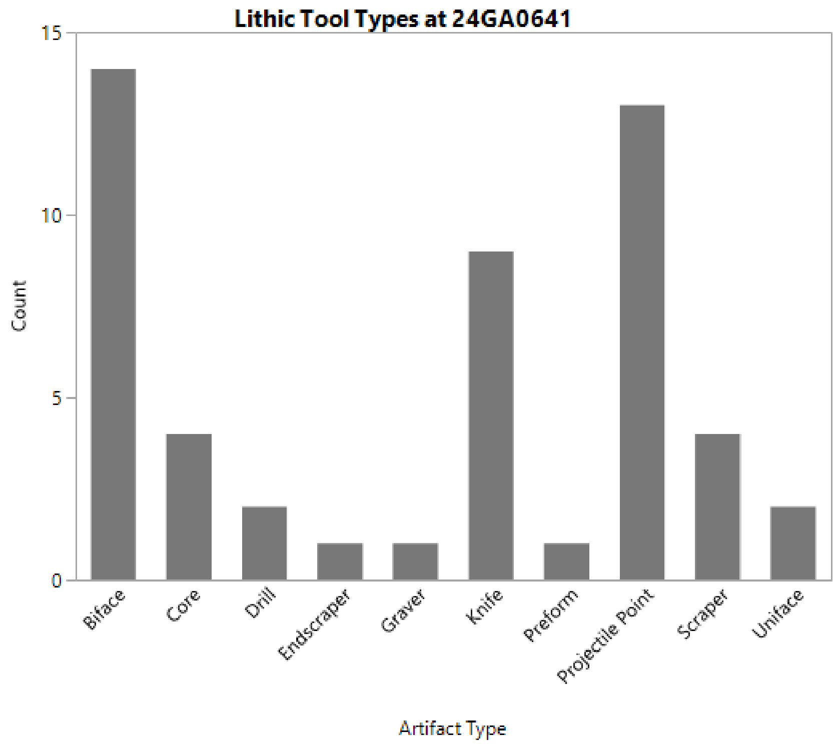


Figure D.2. Tool type frequencies at Corbly Basin, Cabin Meadow (24GA0641) (n = 51).

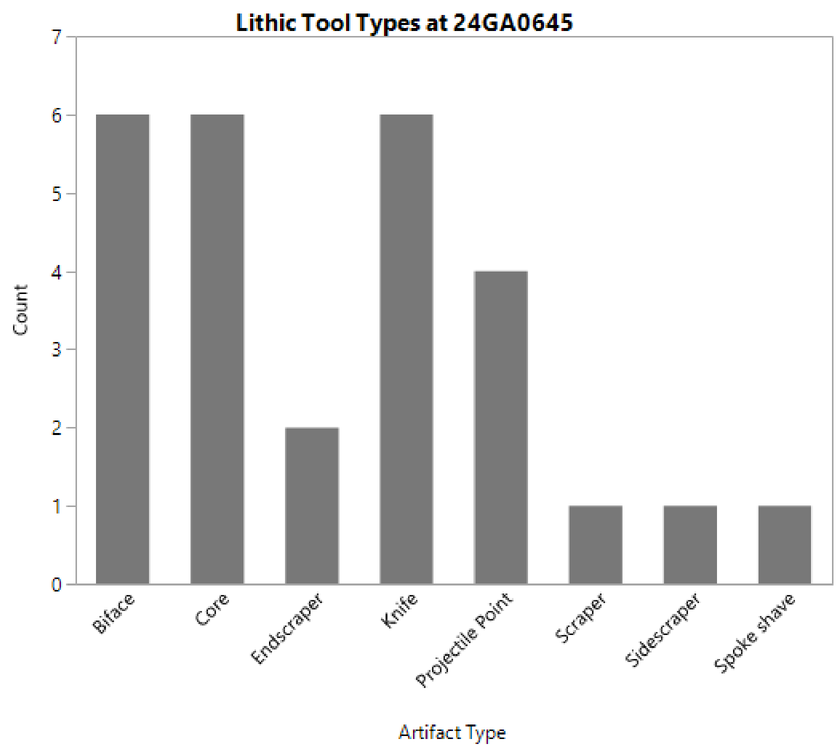


Figure D.3. Tool type frequencies at Limestone (24GA0645) (n = 27).

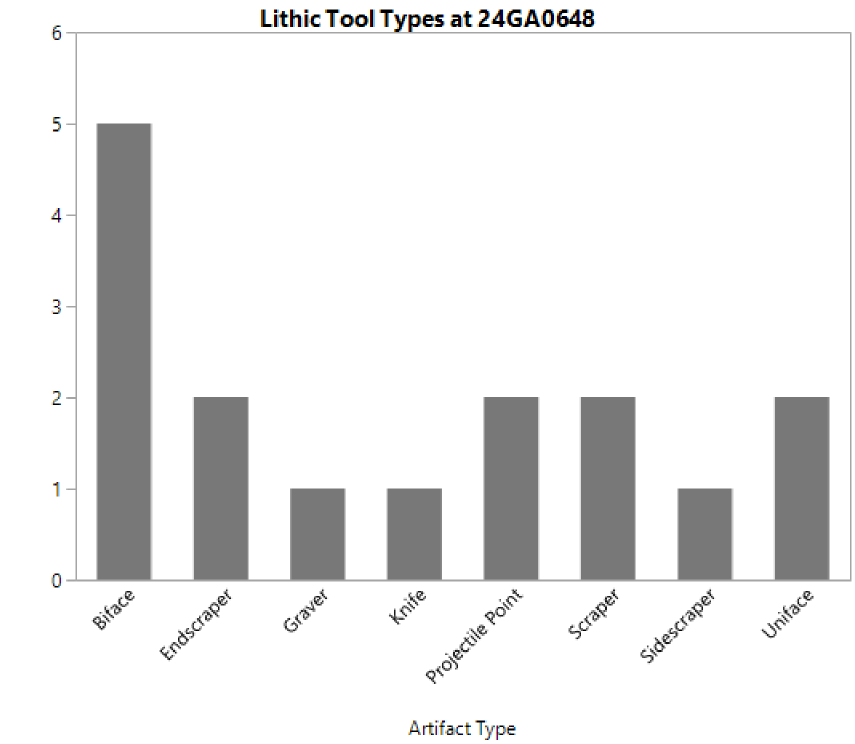


Figure D.4. Tool type frequencies at B16 (24GA0648) (n = 16).

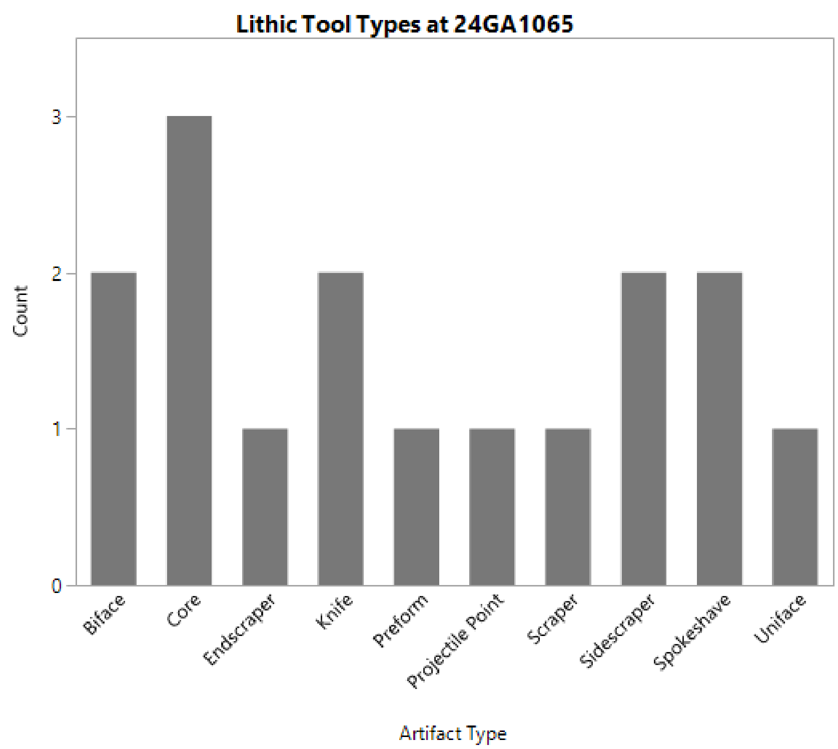


Figure D.5. Tool type frequencies at Tom Reese Creek site (24GA1065) (n = 16).

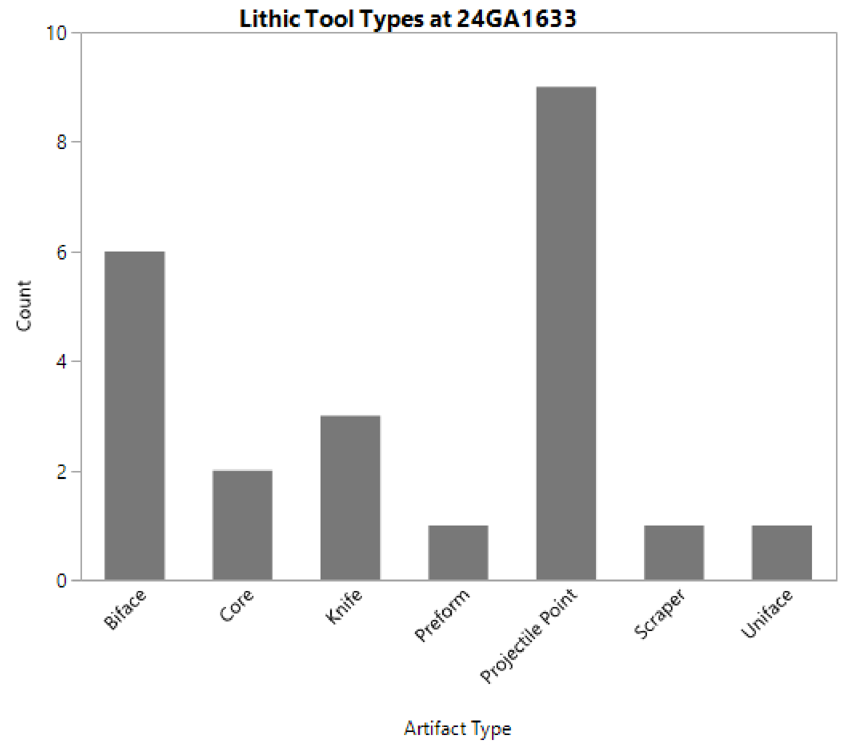


Figure D.6. Tool type frequencies at Bostwick Meadow (24GA1633) (n = 23).

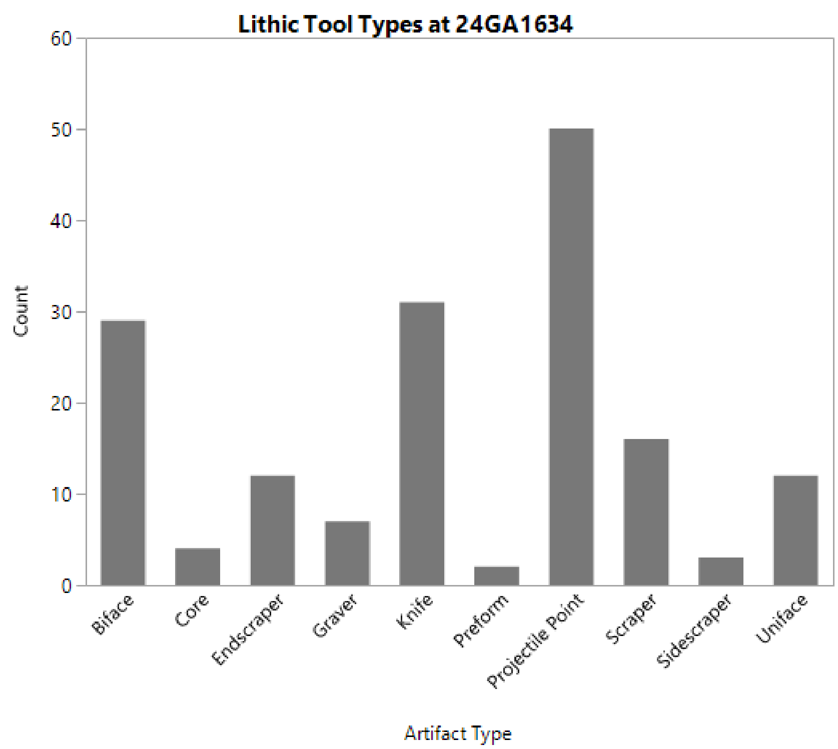


Figure D.7. Tool type frequencies at North Cottonwood Main Camp (24GA1634) (n = 166).

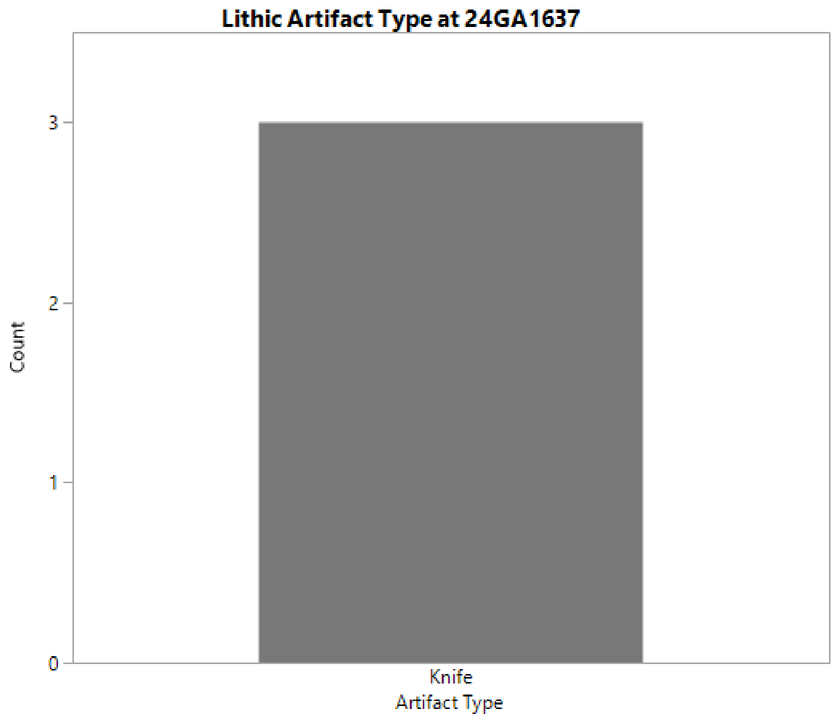


Figure D.8. Tool type frequencies at Limestone Trail (24GA1637) (n = 3).

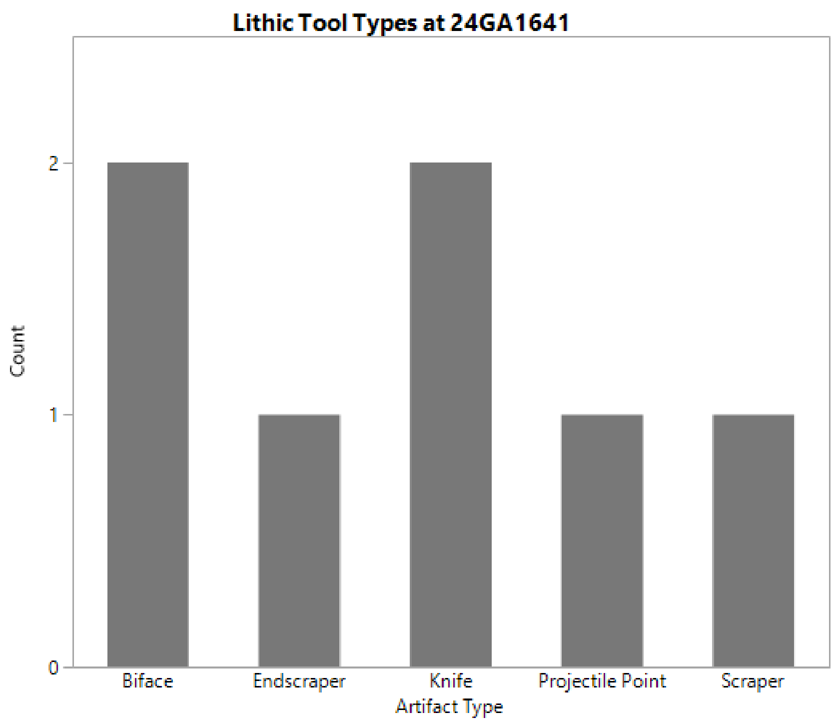


Figure D.9. Tool type frequencies at Schafer Canyon 1 (24GA1641) (n = 7).

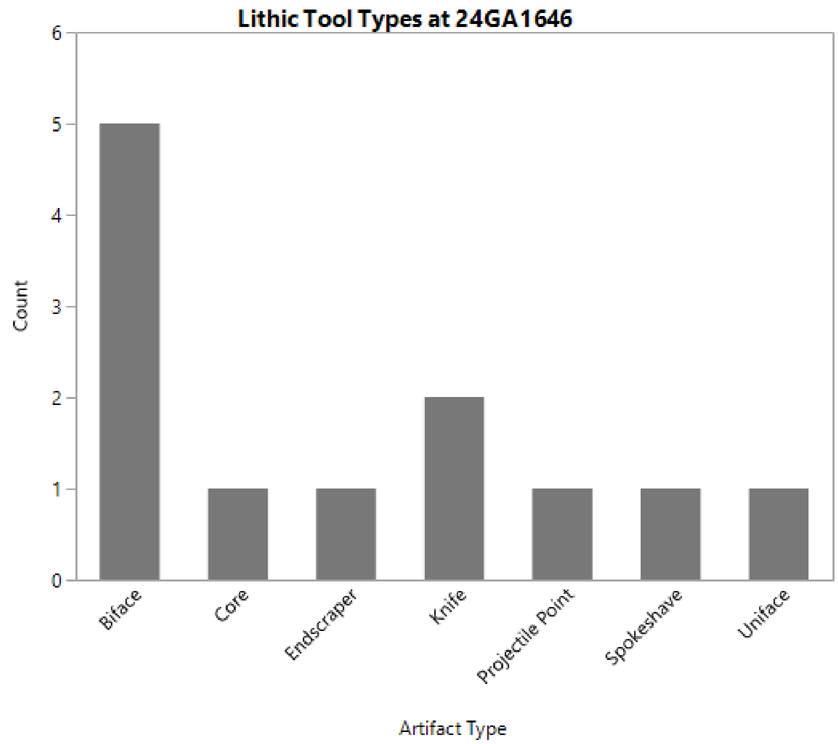


Figure D.10. Tool type frequencies at North Cottonwood, North Fork (24GA1646) (n = 12).

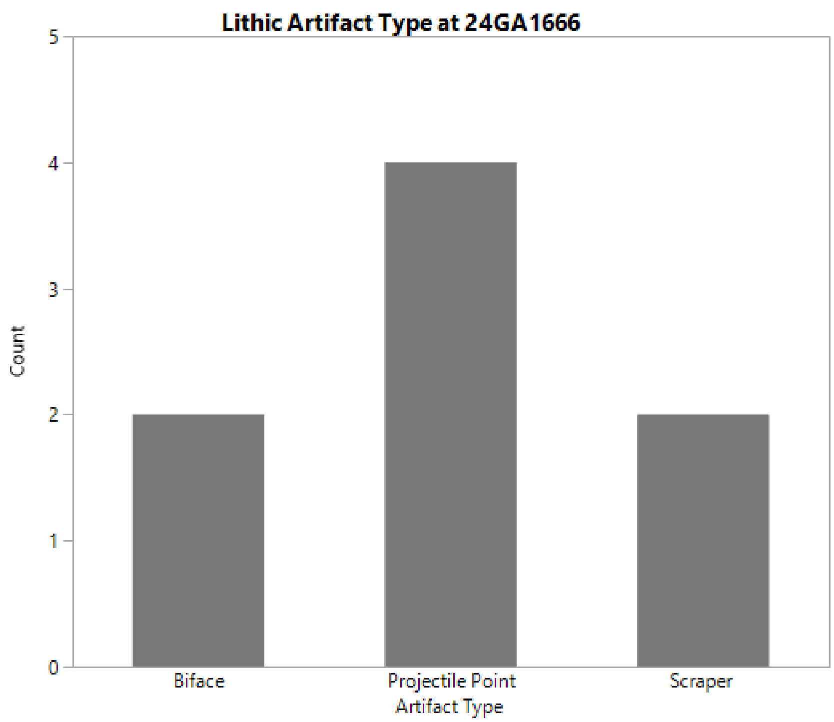


Figure D.11. Tool type frequencies at North Cottonwood at the Forks (24GA1666) (n = 8).

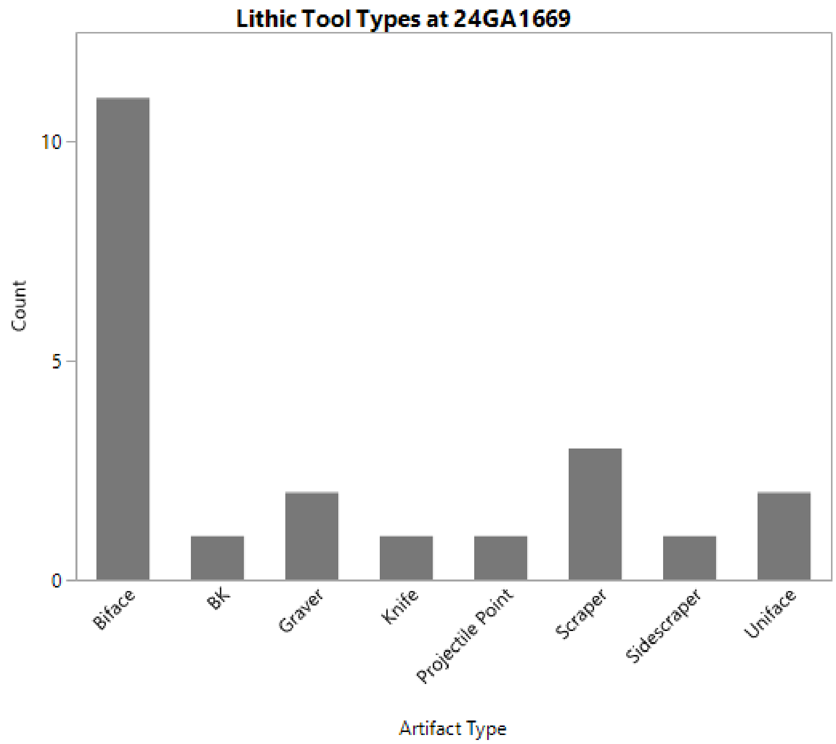


Figure D.12. Tool type frequencies at Rocky Mountain Road (24GA1669) (n = 22).

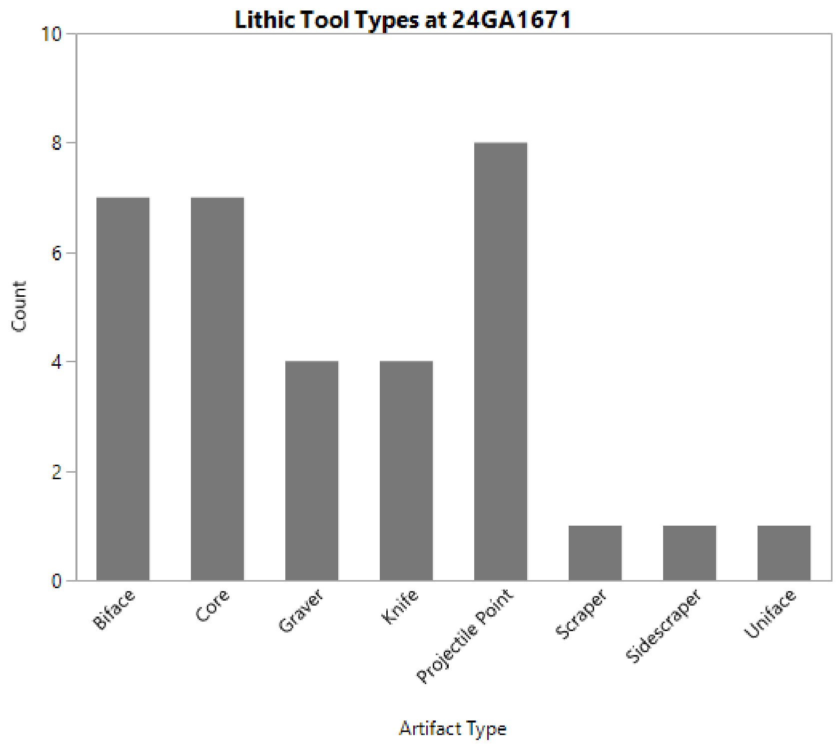


Figure D.13. Tool type frequencies at Tom Reese Creek BD-1 (24GA1671) (n = 33).

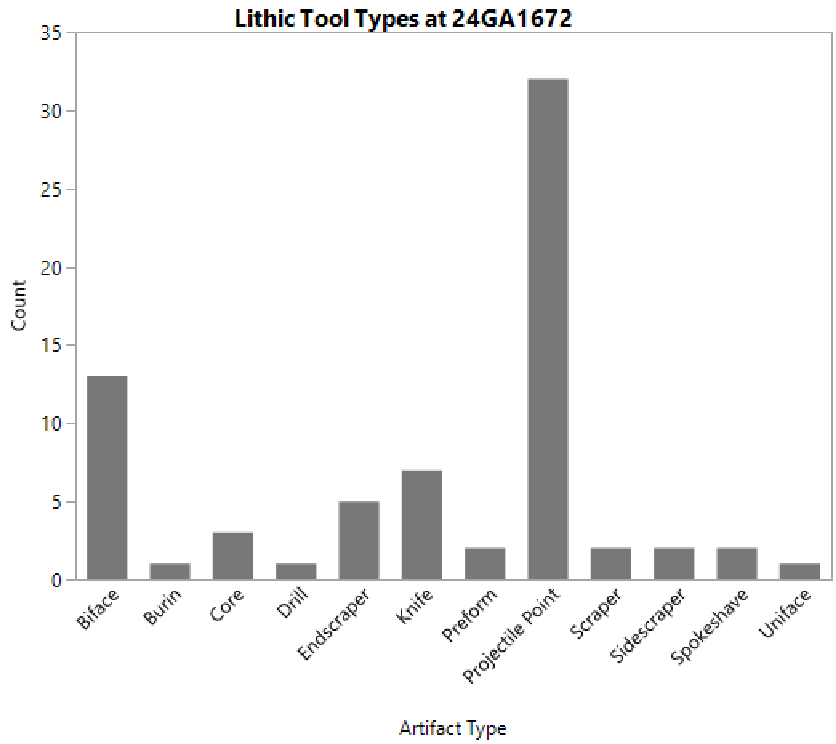


Figure D.14. Tool type frequencies at Limestone Canyon (24GA1672) (n = 71).

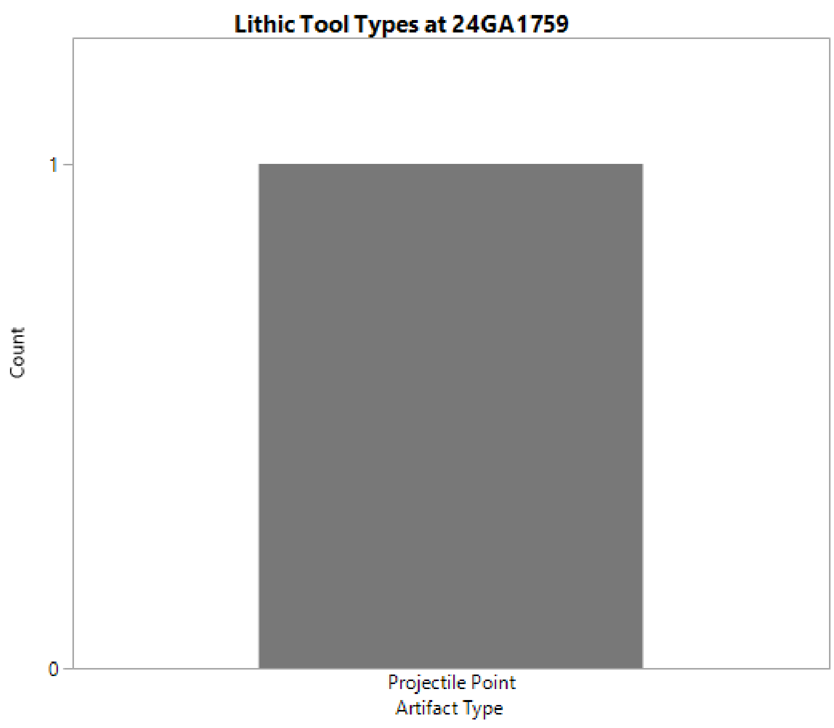


Figure D.15. Tool type frequencies at the Corbly-Limestone Divide site (24GA1759) (n = 1). The other artifacts present were all classified as debitage and, thus, excluded from the analysis.

Appendix E: Comparing FETE Paths to All Bridger Mountain Sites

To provide context to the dated sites in the Bridger Mountains, I also compared the FETE least-cost paths to all sites represented in Fisher's database (n = 31) (Figure E.1 and Table E.1). As before, I excluded isolated finds from the analysis. These sites included other site types, such as the quarry site for Bridger Silicified Siltstone (24GA1635) and other secondary logistical camp sites, such as the Roller site (24GA1624). The average distance from these sites to the nearest FETE paths (n = 211.8 m) is positively skewed because of several outliers, including the Late Archaic Schafer Canyon 1 site (24GA1641) (n = 979.3 m) and the undated Johnson Canyon-Flathead Pass Divide site (24GA1649) (n = 1,246.5 m). The median distance to the modeled paths for all sites (n = 43 m) suggests that people chose to locate most of their sites near the efficient routes through the mountains, as suggested by the results from the dated sites (Table E.2). However, the outliers, especially those sites with distances 1 km or greater from the FETE paths, merit further scrutiny in future research to understand their role in the larger socialized landscape of the Bridger Mountains.

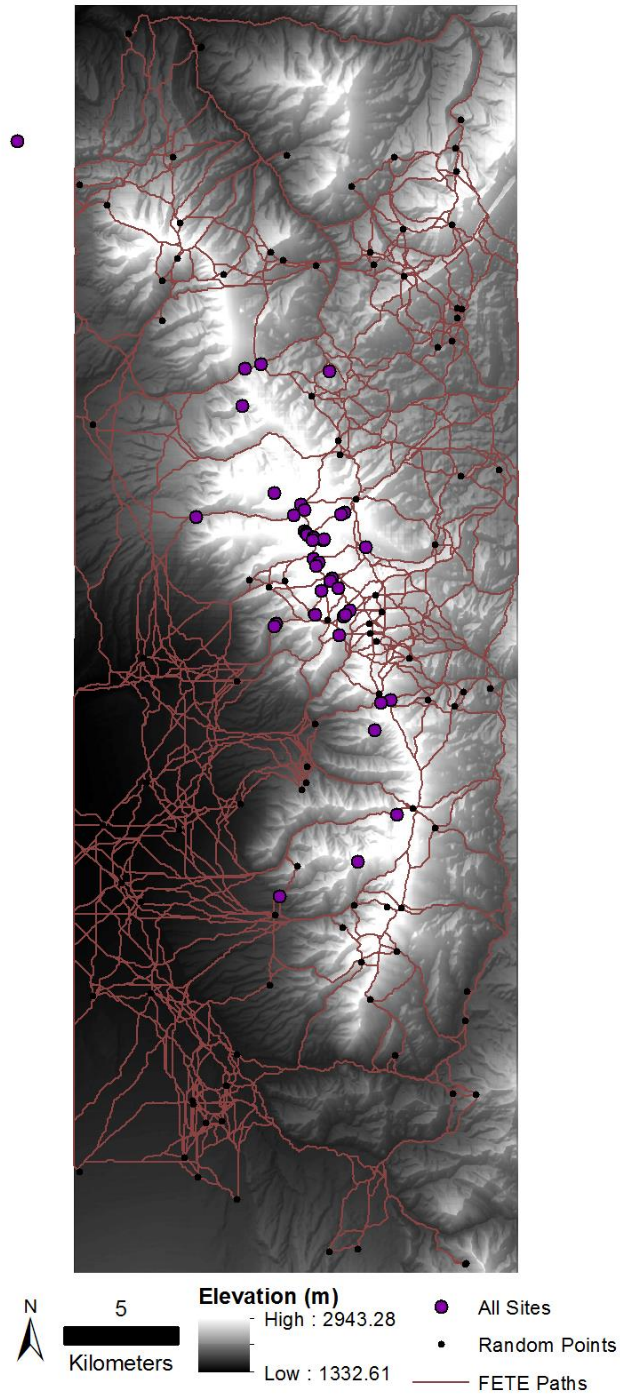


Figure E.1. All sites from Fisher's 2007 database, including dated sites discussed in this thesis, compared to the FETE least-cost paths.

Table E.1. All Bridger Mountain sites from Fisher's database and their distances from the nearest FETE least-cost path.

Site Name	Site No.	Known Travel Corridor?	Typed PPs Present?	Distance to FETE Least-Cost Paths (m)
Flathead Pass	24GA0303	Flathead Pass	Yes	111.7
Unknown	24GA0638	No	No	31
Frazier Lake, East Side	24GA0639	No	No	24.3
Corbly Basin, Cabin Meadow	24GA0641	Sacagawea Peak	Yes	12.1
Unknown	24GA0642	No	No	100.6
West side of Ross Pass	24GA0643	Ross Pass	No	212.2
Dry Canyon	24GA0645	Sacagawea Peak and Ross Pass	Yes	97.9
BSD-9	24GA0647	Sacagawea Peak and Ross Pass	No	31
B16	24GA0648	No	Yes	217.3
Frazier Lake, Upstream	24GA0677	No	No	17.2
Tom Reese Creek, B18	24GA1065	No	Yes	164.1
TRC-BD2	24GA1070	No	No	36.4
CG-ALC-N	24GA1630	Sacagawea Peak	No	64.4
BSD-4	24GA1632	No	No	17.2
Bostwick Meadow	24GA1633	No	Yes	24.3
North Cottonwood, Main Camp	24GA1634	No	Yes	36.4
Bridger Silicificed Siltstone Quarry	24GA1635	No	No	418.9
North Cottonwood, First Meadow	24GA1636	No	No	34.4
CGT4	24GA1638	Sacagawea Peak	No	25.8

Site Name	Site No.	Known Travel Corridor?	Typed PPs Present?	Distance to FETE Least-Cost Paths (m)
CGT1	24GA1639	Sacagawea Peak	No	81
BSD-6	24GA1640	No	No	0
Schafer Canyon 1	24GA1641	No	Yes	979.3
Roller	24GA1642	No	No	8.6
Jones Canyon Meadow	24GA1643	No	No	972.5
NCT2	24GA1644	No	No	43
NNC	24GA1645	No	No	1165.96
North Cottonwood, Upper Site	24GA1646	No	Yes	185.4
CGUM1	24GA1647	Sacagawea Peak	No	17.2
Johnson Canyon-Flathead Pass Divide	24GA1649	Flathead Pass	No	1246.5
Rocky Mountain Road	24GA1669	Flathead Pass	Yes	153.7
Corbly-Limestone Divide	24GA1759	Sacagawea Peak	Yes	34.4

Table E.2. Distance to FETE Paths Compared Across Time Periods and Against All Sites in Fisher's Database

Time Period	No. of Sites	Average Distance to FETE Paths (m)	Median Distance to FETE Paths (m)
Paleoindian	4	52.2	42.5
Early and Middle Archaic	9	65.2	43
Late Archaic	10	170	73.25
Late Pre-Contact	6	94.6	80.2
All Sites	31	211.8	43