Ties that bind on the Northwestern Plains: Contexts for prehistoric trade and travel

Sara Alicia Scott

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TIES THAT BIND ON THE NORTHWESTERN PLAINS:
CONTEXTS FOR PREHISTORIC TRADE AND TRAVEL

By

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Dissertation

Presented in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy
in Anthropology

The University of Montana
Missoula, MT

May 2014

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Abstract

This PhD dissertation focuses on several interrelated archaeological problems in Northwestern Plains and Intermountain prehistory. The dissertation is comprised of three articles that have been either accepted for publication in peer-reviewed regional or international archaeological journals or are in the process of being reviewed for publication. The articles focus on the following subjects: 1) radiocarbon dating and analysis of Late Prehistoric period perishable items from Pictograph and Ghost Caves in south-central Montana; 2) radiocarbon dating of lower cultural levels in Pictograph Cave to assess the accuracy of the chronology established by William Mulloy in 1958; and 3) an analysis of archaeological sites and features along the prehistoric/historic Buffalo Road Trail (commonly known as the Lewis and Clark Trail) in northwestern Montana. Results of these studies indicate perishable items were used at Pictograph Cave between 1371 and 250 years before present (B.P.) and that perishable items such as coiled basketry, show contact or trade with Eastern Great Basin people. Radiocarbon analyses on artifacts from the lowest levels of Pictograph Cave show that its earliest occupation dates to 3820 years B.P., far later in time than the cultural chronology proposed in 1958. Culturally modified trees, rock cairns, prehistoric campsites and unique stone features mark the Buffalo Road Trail and document its use for centuries by Columbia Plateau and Plains Indian groups and by later historic settlers, explorers, and missionaries. Salish and Pend d'Oreille tribal place names for the trail as it crosses the Continental Divide indicate that stone forts were built as defensive structures atop the pass for protection from warring tribes. From a landscape perspective, trails provide information relative to precontact travel, subsistence, trade, and warfare.
ACKNOWLEDGEMENTS

The author is grateful to Montana State Parks, a division of Montana Fish, Wildlife and Parks, for their overall support and financial assistance with radiocarbon dating analyses of artifacts from Pictograph and Ghost Caves. The Montana Archaeological Society, Mercyhurst University, and the Montana Department of Transportation (Steve Platt) also provided financial assistance for this research. John Douglas and Bethany Hauer (University of Montana, Missoula) assisted with access to the Pictograph and Ghost Cave collections.

The USDA Forest Service/Helena National Forest and the Northern Region is gratefully acknowledged for the use of information on the Buffalo Road and for allowing the author to conduct research on the trail. Former Forest Service employees, Margaret Gorski and Amy Teegarden, are thanked for their support in the documentation and interpretation of the Buffalo Road Trail. Anthony Incoshola of the Salish and Pend d’Oreille Culture Committee and Thompson Smith provided oral history information for Lewis and Clark Pass. Chaney Bell shared geographical place names in the Salish language. Tim Ryan and Dave Schwab of EthnoTech, Inc. provided the locations for traditionally used Salish Indian trails.

Special gratitude goes out to my co-authors, Carl Davis, Jim Adovasio, and Tim Urbaniak. Without the help and expertise of these individuals the following dissertation would not have been possible or as interesting. I appreciate the review comments on the dissertation articles by Drs. Kelly Dixon, Marcel Kornfeld, Charles Orser, Maria Zedeño, and other anonymous reviewers. The reviewers improved the quality and organization of each manuscript.
Dissertation Chair, Dr. Kelly Dixon and Carl Davis reviewed drafts of the dissertation manuscript and offered helpful comments and guidance. Dr. Dixon and I spent many hours discussing research topics and she provided ample encouragement and enthusiasm. Dr. Anna Prentiss also helped guide the research and offered logistical and technical support. Eric Carlson produced all graphic illustrations and was exceedingly patient. The author appreciates the review comments of her doctoral dissertation committee at the University of Montana, Department of Anthropology, including Drs. Rafael Chacon, Kelly Dixon, Douglas MacDonald, Anna Prentiss and Richard Sattler.

Lastly, my sincere appreciation is extended to my friends and family, especially my husband, Carl Davis for his unwavering patience and encouragement, and to my children, Madeline and Spencer Davis, for showing both understanding and pride in my academic endeavor.
DEDICATION

For the entire Davis clan,
for their deep respect for education and never-ending zest for life
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CHAPTER 1
INTRODUCTION

This PhD dissertation focuses on several interrelated archaeological problems in Northwestern Plains and Intermountain prehistory. The dissertation is comprised of three articles that have been either published or accepted for publication in peer-reviewed regional or international archaeological journals or are in the process of being reviewed for publication in Plains Anthropologist, the Journal of International Historical Archaeology, and North American Archaeologist. The three articles are submitted as an alternative to a single topic dissertation in accordance with University of Montana Graduate School and Anthropology Department guidelines and protocols.

The three articles focus on the following subject matters: 1) radiocarbon dating and analysis of Late Prehistoric period perishable items from Pictograph and Ghost Caves in south-central Montana; 2) radiocarbon dating of lower cultural levels in Pictograph Cave to assess the accuracy of the chronology established by William Mulloy in 1958; and 3) an analysis of archaeological sites and features along the prehistoric/historic Buffalo Road Trail (commonly known as the Lewis and Clark Trail) in northwestern Montana.

The articles appear in this dissertation in the order that the research was conducted to reflect not only the progression of thought and research, but also how the outcome of one study affected the line of inquiry conducted for the next. In this way, the three articles are interconnected. As an example, the first article concerns exotic perishable items, including basketry found in Ghost Cave. These prehistoric items were transported from a trading nexus tied to the eastern Great Basin by a series of well
established trails, which were later referred to as “roads” by early explorers (Haines 1965; Moulton 1993; Zedeño et al. 2009). My second article focuses on one such trail, the Buffalo Road Trail in northwestern Montana, located on the flanks of the Rocky Mountains—an Indian road—as described by Meriwether Lewis in 1806 (Moulton 1993). Deeply rutted by centuries of aboriginal use, the trail was historically used by Columbia Plateau Indian groups who traveled to the Plains at least twice a year to hunt buffalo. In these journeys, perishable items, such as dried salmon and lithic materials, were no doubt transported in a pattern that was deeply rooted in prehistory. Salish people who used this trail also hunted bison in the Yellowstone River Basin and undoubtedly traveled on well established trails that followed the river within close proximity to Pictograph Cave.

The research described in the three articles initially began as part of federal or state agency cultural resource compliance or resource stewardship projects. The articles on Pictograph and Ghost Caves were prompted by my desire as a Montana State Parks archaeologist, to study and spotlight the extremely important prehistoric artifact collections recovered from the caves over 70 years ago as part of a Works Progress Administration (WPA) project. The collections have received minimal analyses since the original excavations. The collection’s poor condition at the time also urgently needed to be addressed. Further, both caves were excavated before the advent of radiocarbon dating, leaving an accurate assessment of the antiquity of the caves open to question and speculation. The establishment of dates first focused on the perishable remains from the caves, and then on artifacts from the lower excavated levels of Pictograph Cave. The results of the dating analyses are a significant contribution to further understanding hunter-gatherers in this region of south-central Montana.
The trail study was prompted by the 200th anniversary of the Lewis and Clark expedition, and particularly the expectation that the Bicentennial commemoration would bring large numbers of people to “walk in the footsteps of Lewis and Clark,” especially along trail segments that were intact and relatively undisturbed. This public use was expected to potentially damage the trail and its associated historic and archaeological sites, which was a major federal agency concern. As a consequence, the study involved an on the ground inventory of the trail by the author (a Forest Service archaeologist at the time), and then subsequent historical, ethnographic, and tribal oral history research (Scott 2001).

All three investigations thus began as somewhat typical state or federal agency projects in the cultural resource management (CRM) world. In these cases, the resulting work is usually reported in agency documents also known as “grey literature” in which the research is generally only available to the agency that produced it and the State Historic Preservation Office (SHPO). However, given the importance of the studies undertaken at Pictograph and Ghost Caves and the Buffalo Road Trail, the author felt it was essential to publish the work at least at the regional level so the findings were more broadly available to other researchers. In a larger context, the combined subject matters contained in the articles—historic and prehistoric archaeology and the engagement of indigenous people in the interpretation of archaeological sites—form the backbone skill set required of professionals working in the CRM field.

The Pictograph and Ghost Caves articles were co-authored with other professional archaeologists who brought considerable technical expertise and background knowledge to the table. For example, Dr. James Adovasio was essential to understanding
the technology and distribution of coiled basketry. Sampling the Pictograph Cave collection for artifacts suitable for radiocarbon analyses would not have been possible without Timothy Urbaniak’s careful three-dimensional (3-D) model construction of the cave stratigraphy, based on original WPA excavation profile maps. The Buffalo Road Trail article was written exclusively by the author who attempted to blend cultural anthropology, history, archaeology, cultural landscapes, and consultations with contemporary indigenous people into a single body of research. As the senior author of all three articles, I orchestrated and completed all facets of the research and prepared the final manuscripts that comprise this dissertation. The style of each article conforms to the requirements of the particular journal to which it was submitted. However, the dissertation itself is written according to the style guidelines of Plains Anthropologist in order to ensure consistency and readability of the document as a whole.

**RESEARCH PROBLEMS**

The research conducted for this dissertation posed a variety of problems that are critical to further understanding pre-contact and early historic groups who traveled through or settled in what is now Montana. The three articles each address different problems with chronometric dating, trade and travel at the heart of the research. Research problems and issues addressed in this dissertation are described by topic and article as follows.

**Pictograph Cave Perishables**

During the Late Prehistoric to the early Historic period on the Northwestern Plains, from approximately 500 to 1800 years A.D., indigenous cultural groups practiced a complex system of big game hunting involving jumps, traps, and corrals, whose success
depended on careful group interaction, orchestration, and cohesion (e.g., Frison 1991; Kornfeld et al. 2010; MacDonald 2012; Reeves 1983). The “landscape engineering” associated with these practices—the construction of drive lanes and other features—required a high level of social investment which resulted in an increase in cultural complexity among Plains hunter-gatherers (Zedeño et al. 2014:24). This nomadic hunting adaptation produced an abundance of archaeologically visible hunting-related sites, weaponry, and equipment across the Plains. Consequently, archaeologists have traditionally focused more on this “masculine” aspect of material culture, although recent studies deviate from this trend (e.g., Keyser and Klassen 2001; Sundstrom 2002). At most archaeological sites, perishable items undoubtedly accompanied prehistoric stone tool repertoires. But because they are fragile and decompose quickly, they rarely appear in archaeological contexts (Ewers 1968:21). The exception is dry caves, including Pictograph and Ghost Caves in south-central Montana. Artifact collections from these natural (shelter) features offer an opportunity to examine Late Prehistoric perishable items infrequently documented in prehistoric sites.

In addition to being exceptionally large rockshelters with deep cultural deposits, Pictograph and Ghost Caves contained extensive artifact assemblages and abundant perishable items, including cordage, basketry, arrow shafts, hafted knives, hearth sticks, and moccasin fragments. An equivalent collection of perishable artifacts has yet to be found in Montana. The first article included in this dissertation focuses on radiocarbon dating of select perishable artifacts from both caves. Establishing the time period for perishables was deemed critical to understanding the use of each item—use that might also be extrapolated to other regional sites where such evidence was preserved. Further,
the chronometric dates for these individual items allows for comparison with perishable artifacts found in a few select sites in the Bighorn Basin of Wyoming.

Perishable artifacts examined include a tinder stick, coiled basketry fragment, hearth stick and a paint applicator. Items were selected because of their potential association with other artifacts or features, for example, the paint brush with painted historic images of rifles and horses on the wall of Pictograph Cave or the tinder stick with the hearth stick. The coiled basketry fragment was chosen because as with all forms of basketry, the production method is highly culturally standardized thus making it an excellent ethnic fingerprint providing evidence of trade and contact with other cultural groups (Adovasio 2010; Adovasio and Andrews 1986; Adovasio and Pedler 1994).

**Buffalo Road Trail**

The Late Prehistoric period is characterized by not only a proliferation of complex hunting strategies, as previously discussed, but also by networks of trade and social interaction spheres (Creel 1991; Ewers 1968; Spielman 1983; Vehik 1990; Wood 1980). These socioeconomic networks were linked through an array of prehistoric pathways and trails (Blakeslee and Blasing 1988; Farr 2003; Manson 1998; Moulton 1993; Zedeño et al. 2009). One important trail route is the Buffalo Road Trail which essentially connected the Columbia Plateau with areas east of the Continental Divide on the Northwestern Plains.

The location of the trail along the Blackfoot River and across the Continental Divide is primarily known from the 1806 description of Meriwether Lewis. However, locating this ancient trail on the ground was difficult due to decades of cattle and sheep grazing and heavy use by recreationists. My second dissertation article describes efforts
to locate and document the trail and correlate it with historical, archaeological, ethnographic, and tribal oral history information. Although many segments of the trail across the United States bear the name of Lewis and Clark, it is clear from their journals that the expedition did not bushwhack or create their own paths, but instead used well worn routes carved by centuries of pedestrian and equestrian bands of American Indians. Archaeological sites found along the Buffalo Road Trail document its use by Indian groups for well over 1000 years (Aaberg 1985; Brumley 1998; Knight 1989; Lahren 1997; Light et al. 1994; Scott 2001).

Trail research included an examination of both the trail tread and its associated features, as well as how human agency is represented in the obstacles and opportunities encountered in trail travel. The study thus describes a variety of rock cairns, prehistoric campsites, stone forts, and a stone cross that lie along the Buffalo Road. These features are used to demonstrate changing trail use and social dynamics over time. The question of what trails reveal about native landscape perspectives is examined along with the divergent ways that trails connected and bought groups together but also served as territorial barriers between them (Farr 2003; Snead et al. 2009; Zedeño et al. 2009). The relevance of using historical and ethnographic information about trail use is documented and particularly the importance of using oral history information (Colwell-Chanthaphonh et al. 2010; Echo-Hawk 2000; Mason 2000; Whiteley 2002) as provided by the Salish and Pend d’Oreille Tribes, who helped interpret archaeological features found along the trail (Salish-Pend d’Oreille Cultural Committee 2003).
Pictograph Cave Cultural Chronology

Information gathered from the study of perishable artifacts from Pictograph and Ghost Caves and the subsequent study of the Buffalo Road Trail raised questions about the diffusion and trade of items like basketry from the Great Basin to places like Ghost Cave and the role trails played in the diffusion of items between Great Basin, Northwestern Plains and Columbia Plateau groups. Further, given the prominent location of Pictograph and Ghost Caves near the Yellowstone River and its many tributaries—all significant travel corridors—the antiquity of movement between places and the length of time the caves were a component of that pattern became a critical research question. The radiocarbon dates on perishable items indicated cave occupations between 1371 and 250$^{14}$C yr B.P. The obvious resulting question was the age of the entire cultural deposit at Pictograph Cave and the antiquity of its earliest occupation.

The deepest excavated levels of Pictograph Cave extended some 20 feet (6 m) below the cave surface. William Mulloy (1958) assumed that these deep levels contained evidence of Early Archaic and Paleoindian occupations. Thus, establishing firmer chronological control for the lower levels would provide a better understanding of the entire occupational sequence at Pictograph Cave. Once a chronological framework was established, the various occupations and their associated artifacts could be compared with other dated sites in the region, particularly those in the Bighorn Basin of Wyoming where numerous cave and rockshelter sites are identified (Finley et al. 2005; Frison 1991; Husted 1965, 1969; Husted and Edgar 2002; Kornfeld et al. 2010). Given Pictograph Cave’s assumed long term occupation as hypothesized by Mulloy (1958), the article concerning its duration of occupation also examined the site from a landscape
perspective, with particular attention to how trade, travel and interactions with other cultural groups is reflected in the artifact assemblage found in the cave and how its location and setting influenced its long term occupation.

One of the biggest research problems faced in dating the occupational sequence at Pictograph Cave was the reliability of WPA excavation and provenience information. In order to even attempt to sample artifacts for dating, a way to search the collection was critical, along with a way to cross check this information so that items submitted for dating could be reliably provenienced to their original cultural deposit. How the problem was addressed is described in the methods section herein and in further detail in the article.

**RESEARCH METHODS**

Research carried out for all three paper topics followed a similar research process and design. Descriptions of the methods used in each study are provided in the three individual articles. Research for each topic began with an extensive literature review that helped to define, clarify, and validate research problems and questions. This background research was followed by intensive field, laboratory, and archival research along with tribal consultations.

In the case of the Pictograph and Ghost Caves research, perishable artifacts were selected for study based on their association with upper cave deposits (level III), potential correlation with other artifacts or features (the paint brush with rock art/the tinder stick with the hearth stick), or for their culturally diagnostic qualities. For the subsequent cultural chronology study, artifacts were selected based on their documented provenience in the lower levels of the cave. As recommended by my committee member, Dr. Anna
Prentiss, one important criteria was that the artifacts submitted for dating be culturally modified, datable (bone) tools. The fact that they were modified by humans eliminated any question that the artifacts were the result of natural deposition, as would be the case if an animal had entered the cave and died. All artifacts from Pictograph and Ghost Caves used for my analysis are part of the extant collection at the University of Montana.

In addition to the criteria above, all artifacts were chosen based on information in original WPA excavation notes and in Mulloy’s (1958) publication on the excavations. Thanks in part to Montana State Parks funding, the entire Pictograph Cave collection was previously entered into the University of Montana’s PastPerfect database. This enabled samples to be selected from specific provenience locations, based on database queries of artifacts from cultural units level I and II as established by Mulloy (1958). In addition, the recent development of three-dimensional (3-D) models (Urbaniak) showing the WPA excavation grid and stratigraphic units at Pictographic Cave allowed the authors to validate provenience information. The eight selected artifacts were then sent to radiocarbon laboratories for dating. Grant funding and monetary assistance for the Pictograph and Ghost Caves radiocarbon analyses (totaling $7950) were provided through Mercyhurst University (Erie, PA), the Montana Archaeological Society, the Montana Department of Transportation, and Montana State Parks.

Upon receipt of the dating information, each date was then reviewed based on its position in the cultural units defined by Mulloy. In some cases, the dates appeared consistent with their stratigraphic position and cultural unit (relative to the other radiocarbon dates), whereas in other cases they did not, likely indicating stratigraphic mixing. Finally, on the basis of these analyses, the Pictograph Cave dates were compared
with other dates from caves and rockshelters on the Northwestern Plains particularly in the Big Horn Basin of Wyoming and from surrounding areas in eastern Montana.

For the Buffalo Road Trail research, prior to conducting the field inventory, an intensive search of background archaeological reports, historical journals, maps, and trail investigations throughout Montana and elsewhere was completed (Aaberg 1985; Brumley 1998; Davis 1980; Hassig 1991; Hall et al. 2006; Knight 1989; Light et al. 1994; Loendorf and Brownell 1980; Malouf 1962, 1980; McLeod 1980; Napton 1965; Platt 1992; Scott 2001; Stone 1913; Trombold 1991). This information not only provided a context for the trail but also helped determine its location on the ground. A search of ethnographic literature was also completed to ascertain which indigenous groups used the trail and for what purpose (Calloway 2003; Ewers 1958, 1968; Fahey 1974; Haines 1955; Lowie 1956; Turney-High 1937). Journals and documents written by and about early explorers were also critical in examining trail use and changing dynamics by the Historic period (Farr 2003; Gaff and Gaff 1994; Moulton 1993; Point 1967; Thwaites 1905).

Once the background research component of the study was completed, field survey was conducted which examined a half mile-wide (.8 km) trail corridor just over five miles (8 km) in length. An abundance of stone structures were identified and mapped. Lichen analysis was performed on several stone features to measure the growth of various species so that their age of construction could be determined (Hall 2005). Consultations with regional Indian groups concerning traditional place names and oral histories about the Buffalo Road Trail were also undertaken.

Finally, data generated by all three research projects was analyzed and interpreted within relevant archaeological, ethnographic, historical and theoretical frameworks. For
the Pictograph and Ghost Cave research, artifacts were analyzed and compared with assemblages from other cave and rockshelter sites including Mummy Cave, Daugherty Cave, Spring Creek Cave, and others to flesh out similarities and differences in the assemblages (e.g., Frison 1962, 1965, 1968, 1991; Husted 1969; Husted and Edgar 2002). The relationship of coiled basketry and other perishable artifacts with those of the Great Basin Fremont culture, ideas surrounding the Numic expansion, and characteristics of various regional rock art styles were also explored. For the Buffalo Road investigation, landscape studies and a direct historical approach were used as the theoretical orientation and backdrop for examining the trail (e.g., Anschuetz et al. 2001; Basso 1996; Dalgish 2012; Kelly 2003; Trombold 1991; Yamin and Metheny 1996; Zedeño 2000; Zedeño et al. 2009). These approaches both appeared well suited to the interpretation of the trail and its associated features.

Once the data was gathered and the research completed for all three topics, they were documented in article form following the specified format of the particular journal the article was to be submitted to. The three articles follow this introductory section of the dissertation. Summary conclusions follow the three articles.
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CHAPTER 2

RADIOCARBON ANALYSES OF FOUR PERISHABLE ARTIFACTS FROM GHOST AND PICTOGRAPH CAVES, MONTANA

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Abstract

Pictograph and Ghost Caves in Empty Gulch, Montana, yielded an extensive collection of perishable artifacts during Works Progress Administration excavations in the late 1930s. Recent radiocarbon analyses of four perishable artifacts from both caves yielded Late Prehistoric period dates. The dated coiled basketry from Ghost Cave indicates either direct or intermediary trade with Northeastern Great Basin or Fremont groups or an ancient and widespread basketry tradition that is poorly documented on the Northwestern Plains. It is not an indicator of the Numic expansion into this region. Perishable artifacts broaden understanding of the range prehistoric activities in Empty Gulch.

Key words: Ghost Cave, Pictograph Cave, perishable artifacts, basketry, paint applicator

Pictograph Cave (24YL0001) and Ghost Cave (24YL0002) are two of the best known archaeological sites in Montana. Located in Pictograph Cave State Park eight miles (12.8 km) southeast of Billings, the caves were excavated between 1937 and 1941 by Works Progress Administration (WPA) crews under the direction of Henry Melville Sayre and Oscar Lewis (Figure 2.1). William Mulloy, who oversaw the last year of excavation, wrote his PhD dissertation at the University of Chicago on the cumulative results of the five year investigation. Mulloy’s (1958) oft-cited monograph on Pictograph Cave, Ghost Cave, and other sites included the first well-developed prehistoric chronology for the Northwestern Plains. His chronological framework was widely
used by Plains archaeologists until modified by Brian Reeves (1983) and George Frison (1991).

In addition to being exceptionally large rockshelters with deep cultural deposits, Pictograph and Ghost Caves contained extensive artifact assemblages and abundant perishable items, including, cordage, basketry, wood implements, and moccasin fragments. An equivalent collection of perishable artifacts has yet to be found in Montana. An estimated 30,000 artifacts were removed from Pictograph and Ghost Caves. The skeletal remains of nine individuals were also discovered in the two caves. Pictograph Cave is widely known for its abundant rock art. Over 100 elaborate ceremonial and biographic style pictographs, including shield figures, various animals,
flintlock guns, and horses with riders line the back wall of the cave (Dean 1997; Loendorf and Dean 1993; Loubser 2011; McCleary 2008; Mulloy 1958:118-139).

The Pictograph and Ghost Caves excavations are a product of WPA-era archaeology. Excavations did not follow natural stratigraphy; provenience information was variable and artifact processing and curation were fraught with problems. Specimens from Pictograph and Ghost Caves became co-mingled in the same collection. Many artifacts were lost in a visitor center fire several decades ago and as the collection was moved from various locations where it was being processed and analyzed. Montana State Parks, a division of Montana Fish, Wildlife and Parks, owns and manages Pictograph Cave State Park (a National Historic Landmark) and recently facilitated condition assessments and cataloguing of the collection at the University of Montana-Missoula. The Museum of the Rockies at Montana State University also owns a significant portion of the collection from Pictograph Cave but this collection has yet to be fully catalogued and exact contents, including the number of perishable artifacts, are unknown.

Despite the complex archaeological histories of both sites, each artifact collection possesses information potential that is yet to be fully realized. Despite several excellent attempts (Baker 1989; Hardes 2006; Schwab 1987), most of the Ghost and Pictograph Cave artifacts lack complete descriptions, let alone reanalysis and reporting using modern methods and technologies.

This paper focuses on four perishable artifacts from Pictograph and Ghost Caves: a coiled basketry fragment, tinder stick, paint applicator, and a hearth stick. All four artifacts were radiocarbon dated and thus can be placed in a chronological context. The
artifacts are compared with similar artifacts on the Northwestern Plains and adjacent regions.

**SITE DESCRIPTION/BACKGROUND**

Pictograph Cave State Park contains three large, U-shaped rockshelters within its 23-acre footprint, including Pictograph Cave, Middle Cave (which was culturally sterile), and Ghost Cave (Figure 2.2). The park is located in a small, sandstone rincon called Empty Gulch (Figure 2.3). The setting and archaeology of Ghost and Pictograph Caves are described in detail by Mulloy (1958) and by later archaeologists and avocationalists (Aaberg and Crofutt 2008, 2009; Axline 1997; Conner 1967; Deaver 1986; Schwab 1987; Schwab et al. 1996; Stockton 1962; Vanaman 1991). Therefore, only a brief summary of the occupational history is provided regarding the archaeological context and provenience for the four perishable artifacts reported herein.

Ghost and Pictograph Caves are actually rockshelters formed within the weakly consolidated Eagle sandstone (Hanson 1991; Rapp and Hill 2006:3). Thus, the rockshelters are highly vulnerable to erosion by wind, water, temperature fluctuations, and wetting-drying cycles (Loubser 2011:3; Smyers 2012:80-88). Block fracturing and spalling of the Eagle sandstone is common, as attested by the large and abundant boulders found below the cliff formation, as well as inside the rockshelters. Mulloy (1958:27) specifically noted that excavations were made difficult by these sandstone blocks. These natural processes, combined with the effects of rodent burrowing, wildlife denning, and past and recent human activity, disturbed and churned the sand-encased
Figure 2.2. Photograph of Empty Gulch showing Pictograph and Ghost Caves (photograph courtesy of Tim Urbaniak).

Figure 2.3. Contour map of Empty Gulch (based on Mulloy 1958:24) showing the caves and previous excavations in Pictograph Cave State Park.
cultural deposit inside the rockshelters. In fairness to the WPA efforts, the conditions encountered in Ghost and Pictograph Caves presented significant excavation challenges.

Based on five years of field records of varying quality and thoroughness, Mulloy (1958) divided the stratigraphy of Pictograph Cave into four separate levels based on artifact vertical positioning and type. The cave was excavated to about 23 feet (7 m) below ground surface. Pictograph Cave I, the oldest level (or cultural unit), was characterized by late Paleoindian occupations on the basis of projectile point types, while Pictograph Cave IV was the most recent level and contained metal artifacts and pottery. Pictograph Cave III produced the most abundant archaeological materials dating to the Middle to Late Archaic and Late Prehistoric periods (Mulloy 1958). With the exception of Pictograph Cave II (which produced less material and is similar in most respects to Pictograph Cave I), all levels yielded abundant stone and bone tools and refuse, as well as, less commonly, wood, bone, cane, hide, and feather artifacts. Bison remains were the most abundant in Pictograph Cave I, but species diversity increases (rabbit, deer, and antelope) in the successive levels and over time (Mulloy 1958).

Ghost Cave was completely emptied of its deposit to a depth of 40 feet (12 m) by the WPA excavation crews, but only the upper eight feet (2.4 m) of the cave deposit was culture-bearing (Schwab 1987:40). In artifact content, Ghost Cave most closely resembles Pictograph Cave III. However, the number of artifacts, including basketry fragments, bone bracelets, points, whistles and gaming pieces; and Olivella and Dentalium shell beads, and projectile points is significantly larger than in Pictograph Cave. Based on his distributional analysis of artifacts and features, Schwab (1987:180-185) inferred that Ghost Cave was used primarily as a location for retooling and re-
hafting hunting equipment and as a staging area for communal hunting activities during the Late Prehistoric Period. Davis et al. (1994:42-48, Table 9) suggested that the Ghost Cave artifact assemblage was the product of Beehive Complex peoples who inhabited or moved through southeastern Montana at approximately A.D. 400 to A.D. 1150. Similar assemblages were recovered from a handful of Beehive Complex sites in southeastern Montana (Fredlund 1988:171-182).

METHODS

Despite the great archaeological importance of Ghost and Pictograph Caves, only three radiocarbon dates exist from the caves and surrounding area (Table 2.1). A single date of 1470 \(\pm 160\) \(^{14}\)C yr B.P. (Beta-17312; bone) was obtained from unidentified faunal remains recovered inside Pictograph Cave (Table 2.1; Deaver 1986:25). A radiocarbon date of 2,145 \(^{14}\)C yr B.P. (average of three samples) was derived from a turtle figure painted with charcoal based pigment on the wall of Pictograph Cave (Table 2.1; Rowe 1995). Recent survey and small-scale testing was conducted in Empty Gulch below the caves to facilitate Montana State Park construction projects, including a new trail and visitor center (i.e., Aaberg and Crofutt 2008, 2009; Crofutt and Aaberg 2008; Deaver 1986, Deaver and Vander Steen 1993; Feyhl 1966). A date of 850 \(\pm 40\) \(^{14}\)C yr B.P. (Beta-243945 on bone collagen) was obtained from a cooking hearth containing bison bone that was exposed in a test unit within a proposed trail route below the rockshelters (Figure 2.2, Table 2.1; Aaberg and Crofutt 2008:32).

Radiocarbon dating was developed a decade after the WPA’s 1937 to 1941 excavations. Soil and hearth samples from the excavations (as noted in the original field records) are not part of the extant collection, although an unproductive effort was made
by one of the authors (Scott) to locate them. Both caves yielded an abundance of organic remains suitable for radiocarbon dating, with certain limitations. Exact provenience is problematic for many specimens, although most artifacts can be related to Ghost Cave or Pictograph Cave and (usually) a particular level-cultural unit (i.e., levels I-IV) based on the information written in ink directly on artifacts. Second, the amount of handling and treatment of fragile organic artifacts (including shellacking) over the past 70 years is unknown, and contamination is a problem. Some artifacts were attached to displays with glue, and remnants of this practice still remains on several artifacts.

With these concerns in mind, our research interest in the radiocarbon dating of organic specimens from Ghost and Pictograph Caves was twofold. First, basketry is a culturally highly diagnostic artifact type (Adovasio 1970, 1974, 1975, 1977, 1986, Adovasio and Andrews 1986; Adovasio and Pedler 1994), which is exceptionally rare in Montana. Its presence in Ghost Cave is therefore noteworthy, especially in relation to the extensive but undated cultural assemblage found. The interpretive potential of the basket

<table>
<thead>
<tr>
<th>Sample</th>
<th>Lab. No.</th>
<th>(^{14})C yr B.P.</th>
<th>2-Sigma Calibration</th>
<th>Provenience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood-paint applicator</td>
<td>Beta-316356</td>
<td>250 ± 30</td>
<td>AD 1480 to 1650</td>
<td>PC III</td>
</tr>
<tr>
<td>Wood-hearth stick</td>
<td>Beta-316357</td>
<td>450 ± 30</td>
<td>AD 1330 to 1440</td>
<td>PC III</td>
</tr>
<tr>
<td>Wood-tinder stick</td>
<td>OxA-21513</td>
<td>957 ± 27</td>
<td>AD 1022 to 1055</td>
<td>PC III</td>
</tr>
<tr>
<td>Textile-basketry</td>
<td>OxA-21512</td>
<td>1371 ± 31</td>
<td>AD 606 to 698</td>
<td>Ghost Cave</td>
</tr>
<tr>
<td>Charcoal-rock art/turtle figure</td>
<td>TAMU-3M152,</td>
<td>2300 ± 60, 2120 + 190, 2010 + 130</td>
<td>N/A</td>
<td>Pictograph Cave</td>
</tr>
<tr>
<td></td>
<td>3M160, 3M172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearth-bone/trail testing</td>
<td>Beta-243945</td>
<td>850 ± 40</td>
<td>AD 1050 to 1260</td>
<td>Empty Gulch</td>
</tr>
<tr>
<td>Faunal remains</td>
<td>Beta-17312</td>
<td>1470 ± 160</td>
<td>N/A</td>
<td>Pictograph Cave</td>
</tr>
</tbody>
</table>

Table 2.1. Radiocarbon dates from Ghost Cave, Pictograph Cave, and Empty Gulch.
fragment and an attendant radiocarbon date was deemed greater by us than other interesting but less diagnostic perishable items.

The archaeological deposit in Pictograph Cave is not radiocarbon-dated with the exception of Deaver’s (1986) limited testing. However, a variety of organic items are potentially datable in all of the cultural levels defined by Mulloy (1958). We chose to focus on the Pictograph Cave III component because of its archaeological richness and inferred similarities with Ghost Cave. More specifically, we focused on the tinder stick, hearth stick, and paint applicator. Of these, the latter specimen could potentially provide an indirect date for at least some of the red hematite-painted rock art in Pictograph Cave. We also wanted to test whether the tinder stick and hearth stick were contemporaneous and perhaps used together.

We were cognizant of the destructive nature of radiocarbon dating in choosing the samples. In each case, an approximate 2 mm piece was removed from each specimen using cotton gloves and an X-Acto knife or small scissors. The specimens were then wrapped in aluminum foil and plastic bags and submitted to the University of Oxford Radiocarbon Accelerator Unit, United Kingdom (basketry fragment, tinder stick), and Beta Analytic Radiocarbon Dating Laboratory, Miami, Florida (paint applicator, hearth stick). The radiocarbon dating results are reported in Table 2.1.

One dating concern was the “old wood” problem, including the possibility that wood to make implements was derived from older packrat middens (e.g., Schiffer 1986). However, the tinder stick, paint applicator, and hearth stick were undoubtedly manufactured from green wood. The outer bark (applicator) and fibrous strands (tinder stick) could only have been peeled back when it was soft and pliable because if it was
dried the stick would have split and would not have been easy to manipulate. In the unlikely event that a dead stick of wood was used for the applicator, the dating would only be off by a matter of a few decades since small woody debris readily decomposes in the harsh environment of southeastern Montana. Concerns regarding the amount of previous artifact handling and contamination were addressed by careful removal of AMS samples from inconspicuous areas (i.e., the interior of the split paint applicator) where contamination was least likely.

Tree species identification for the paint brush and hearth stick was established by Peter Kolb, University of Montana, Forestry Department, using a 25 power microscope. Based on vascular structure observations (using Stubbendieck et al. 1992), Kolb provided tentative identifications as to wood genera. Cross-sections of each artifact were required for exact species identification. Because of the fragility of the artifacts and concerns about their preservation, cross-sectioning was not attempted.

**ARTIFACT DESCRIPTION, COMPARISONS, AND DATING RESULTS**

Descriptions and artifact distribution and comparisons for the four perishable specimens from Pictograph and Ghost Caves are provided in the following section. Interpretive information is also provided. Radiocarbon dates for each specimen are given as the item is discussed. The discussion of each artifact also includes information regarding other sites where similar specimens were found.

**Coiled Basketry – Ghost Cave**

William Mulloy (1958) reported that four basketry fragments were recovered from Ghost Cave. However, only one basketry fragment is present in the existing
collection at the University of Montana-Missoula (Figure 2.4). Mulloy (1958:118) described the basketry as follows:

Of four fragments of coiled basketry, three are too small to be informative. The fourth, however, is a well preserved rim section. The foundation is single rod, split branch averaging about sixteen hundredths of an inch in diameter and a small bundle of shredded fiber around which the sewing elements are passed to unite the coils. The sewing is sinistral and the stitches do not interlock. Each stitch passes around one foundation rod and the fibre bundle above and below it. Each coil is about three tenths of an inch wide and a quarter of an inch thick. Although the top of the fragment apparently served for a time as the edge of the vessel, originally there appear to have been more coils, the stitches of which have been cut off flush with the last coil present.

In 2009, the single basketry fragment (UM accession No. 2009-05-01, 3114), the one Mulloy felt was most informative was examined and analyzed by one of the authors (Adovasio). The fragment is 96.8 mm long by 16 mm wide, and its maximum thickness is 8.3 mm. The specimen is a wall fragment from what was most likely a tray used for parching seeds. The basket is closely coiled with a half rod and bundle stacked foundation. The stitching is non-interlocking and the half rod faces downward toward the bottom or center of the basket. The stitches are closely packed and the resultant foundation is watertight by virtue of the tightness of the weave. The basket was sewn right-to-left. No split stitches are apparent on the outside or non–work surface. The splice type has fag ends clipped short with the moving ends bound under. The work surface of the basket (where the awl for stitching was inserted) is concave. The stitch gap is between
0-2 mm. Rods and stitching are willow (*Salix sp.*) and the bundle is milkweed fiber (*Asclepias sp.*).

An uncorrected radiocarbon date of $1371 \pm 31 \text{ }^{14} \text{C yr B.P.}$ (OxA-21512, #3114) was obtained on the coiled basketry fragment. At two-sigma calibration probability generated with the Oxcal computer program, using the calibration data set INTCAL09 (Reimer et al. 2009), the specimen would date to approximately 606-689 cal A.D. and fall within the Late Prehistoric period (Frison 1991; Mulloy 1958). This date is highly consistent with the age range for coiled basketry from rockshelters in the Bighorn Basin of northern Wyoming (Table 2.2; Frison et al. 1986). It is also within the inferred temporal range of A.D. 400 to A.D. 1150 for the Beehive Complex in southeastern Montana (Fredlund 1988:178).
<table>
<thead>
<tr>
<th>Site</th>
<th>No.</th>
<th>Foundation</th>
<th>Stitching</th>
<th>( ^{14} \text{C yr B.P.} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghost Cave 24YL0002</td>
<td>4</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>1371 ± 31</td>
</tr>
<tr>
<td>Mummy Cave 48PA201</td>
<td>1</td>
<td>½ rod &amp; welt stacked Whole rod</td>
<td>Noninterlocking</td>
<td>4420 ± 150</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>Interlocking</td>
<td>1230 ± 110</td>
</tr>
<tr>
<td>Spring Creek Cave 48WA1</td>
<td>1</td>
<td>1 split rod</td>
<td>Interlocking</td>
<td>1725 ± 200</td>
</tr>
<tr>
<td>Daugherty Cave 48WA302</td>
<td>5</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>No date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ rod &amp; welt stacked</td>
<td>Noninterlocking</td>
<td>No date</td>
</tr>
<tr>
<td>Sorenson 24CB202</td>
<td>1</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>1310 ± 100</td>
</tr>
<tr>
<td>Mangus 24CB221</td>
<td></td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>1070 ± 70</td>
</tr>
<tr>
<td>Bottleneck Cave 24CB206</td>
<td>1</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>1510 ± 200</td>
</tr>
<tr>
<td>Medicine Lodge Creek, 44BH332</td>
<td>2</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>1760 ± 100</td>
</tr>
<tr>
<td>Bush Shelter, 24WA324</td>
<td>2</td>
<td>½ rod &amp; welt</td>
<td>Noninterlocking</td>
<td>No date</td>
</tr>
<tr>
<td>Salt Trough Canyon</td>
<td>1</td>
<td>½ rod &amp; bundle stacked</td>
<td>Noninterlocking</td>
<td>No date</td>
</tr>
</tbody>
</table>

Table 2.2. Coiled basketry from Northwestern Plains archaeological sites (from Frison et al. 1986).

The tinder stick, hearth stick, and paint applicator are unique but cannot be considered culturally-diagnostic artifacts. Such tools undoubtedly were used across the Northwestern Plains by many Indian groups. In sharp contrast, coiled basketry can potentially shed light on at least one of the groups who may have visited Ghost Cave. As with all forms of basketry, the production of coiling is a highly culturally standardized process in which all of the myriad manufacturing decisions are literally visible in the
finished product. For this reason, coiled or any form of basketry is an excellent ethnic fingerprint (Adovasio 2010; Adovasio and Andrews 1986; Adovasio and Pedler 1994).

Unfortunately, basketry of any subclass (i.e., twining, coiling, or plaiting) is extremely rare in Northwestern Plains artifact assemblages (Adovasio 1974; Jolie 2006; Schneider 1990; Sundstrom 1996). Two fragments of coiling are briefly mentioned but not described in detail by Husted (1969:24, 39) from Carbon County, Montana. Coiled basketry is slightly more common in the Bighorn Basin of north central Wyoming (Figure 2.5). In the Bighorn Basin, coiled basketry similar to the solitary Ghost Cave example include a complete specimen from Salt Trough Canyon, and fragments from Bottleneck, Spring Creek, Daugherty, Medicine Lodge Creek, Sorensen, and the Mangus localities on the Montana/Wyoming border (Frison 1965, 1968; Frison et al. 1986; Husted 1969). A relatively large coiled basketry fragment was recently discovered in a melting ice patch in the Beartooth Mountains of south central Montana (Halcyon LaPoint, personal communication 2013). It is currently undergoing conservation treatment and analysis.

Radiocarbon dates for Northwestern Plains occupations associated with coiled basketry range from as early as 4420 ± 150 14C yr B.P. at Mummy Cave on the North Fork of the Shoshoni River in Wyoming (Husted 1969; Husted and Edgar 2002) to 1070 ± 70 14C yr B.P. at the Mangus Site in Carbon County, Montana (Husted 1965). On the northern edge of the Eastern Great Basin coiled basketry is more common and far more ancient (Adovasio 1970, 1974, 1986; Adovasio and Jolie 2011; Connolly 2013; Geib and Jolie 2008). The specific foundation type close coiling, half rod and bundle stacked is initially apparent about 8628-8428 B.P. and thereafter persists to as recently as 1550-650
Figure 2.5. Distribution of coiled basketry in Montana and the Bighorn Basin of Wyoming (based on Frison et al. 1986:164): (1) Pictograph and Ghost Caves; (2) Sorenson and Mangus Sites; (3) Medicine Lodge Creek; (4) Salt Through Canyon; (5) Daughtery Cave; (6) Spring Creek Cave; (7) Bush Shelter; and (8) Mummy Cave.

B.P. (Adovasio et al. 2002; Jolie and Geib 2010). Interestingly, this highly diagnostic coiling type becomes extinct with the arrival of the Numic speakers and is the only prehistoric Great Basin coiled foundation not documented ethnographically (Adovasio and Pedler 1994).

Prehistoric Northwestern Plains coiled basketry predominately exhibits a half rod and bundle or, less commonly, a half rod and welt stacked foundation with non-interlocking stitches (Table 2.2). Additionally, work direction is usually right-to-left.
Rods, welts, and stitches are generally made of willow (*Salix sp.*) while bundles are more variable. With the exception of the early Mummy Cave specimen, all of the extant Northwestern Plains coiled basketry fragments are unpitched though probably watertight due to the tightness of the sewing. Nearly all are portions of containers of unknown configuration or shallow seed parching trays.

In virtually all attributes, coiled basketry from southern Montana and northern Wyoming is most similar to Fremont-style basketry from the Eastern Great Basin (Adovasio 1975, 1979, 1986, 2010; Adovasio and Andrews 1986; Adovasio et al. 2002; Adovasio and Pedler 1994). However, no solid evidence exists that Fremont people ever inhabited the Yellowstone River region. A purported Fremont-style petroglyph is reported at Signal Mountain (24ML563) in southeastern Montana (Greer and Greer 2007a:5). It depicts a warrior wearing a Fremont-style necklace but its other stylistic attributes (hairstyle, breastplate) are clearly Plains-like. Fremont rock art of the so-called Vernal style is present near the Wyoming and Utah state line, in the proximity of Flaming Gorge Reservoir and Rock Springs, Wyoming (Keyser and Poetschat 2012). This Fremont-style art is sufficiently close to the known margins of Fremont territory that it may indicate either the presence of a Fremont artist or the diffusion of Fremont artistic conventions to a nearby Plains population.

Similarly, an open-air locus of alleged Fremont affinities was recently reported at the Jack Creek Underlook site (24CB1861), located near Bridger, Montana (Hadden 2008; Glade Hadden, personal communication 2012). Corner- and side-notched arrow points (typed as Rose Spring-Eastgate), coarse grey pottery (typed as San Rafael Fremont-like) and an impressive slab-lined fire hearth dated between 660-860 cal A.D.
(2-sigma; within the Fremont time frame) lead the investigator to conclude that this site was an actual Fremont “outlier.” No associated house remains or other features were identified. From our perspective, the projectile points would not stand out in any Northwestern Plains collection and the few coarse, grey ceramics resemble Intermountain Tradition ware. As a result, it is unlikely this site reflects a definitive Fremont presence for this area.

The coiled basketry found in dry caves in northern Wyoming and in Ghost Cave may be the strongest indication of a Fremont influence or presence this far north. Indeed, the solitary Ghost Cave specimen would be lost in any collection of coiled Fremont basketry. As noted many times previously (Adovasio 1975, 1986; Adovasio and Pedler 1994; Adovasio et al. 2002), the probability of an independent invention of the type of coiling recovered from Ghost Cave is virtually zero.

There are, of course, several possible explanations for the occurrence of a Fremont-style coiling specimen in this portion of Montana. It may actually represent a Fremont piece traded into or brought into the region by a Fremont artisan or traveler or it may constitute a locally produced item descended from the same Archaic parent technology as Fremont. The trade option is attractive for a number of reasons as discussed below.

The abundance of shell items originating from the Pacific Ocean found in Ghost Cave clearly supports the existence of trade networks in the Late Archaic and Late Prehistoric periods. In other areas of the Plains, during the first millennium A.D., sites in the Central and Southern Plains reveal an interesting mix of Eastern Woodland and southwestern influences clearly indicating trading networks that spanned great distances
The fact that bison hides from the Plains appear in southwestern Pueblo sites further documents the existence of these interaction spheres (Creel 1991:40). Extensive, well-established American Indian trade networks were documented by Lewis and Clark and by other earlier explorers, including a major trading center with access to Great Basin tribes located in the southwestern corner of Wyoming (Ewers 1968:16). Noted trail routes often referred to as well rutted roads by Lewis and Clark and other early explorers reflect the antiquity of and the linkage of many distant places (Scott 2001; Zedeño et al. 2009).

In light of these extensive trade networks, it is worth noting that several items found in Pictograph Cave possess Great Basin counterparts, including incised bone pieces (Mulloy 1958:48). These incised rectangular bone artifacts classified as gaming pieces by Mulloy are similar to artifacts found within the region defined for the Fremont (Madsen 1989:2-3). These additional similarities provide further, albeit limited, support for trade or other connections between the Fremont of the Northern Great Basin and the Northwestern Plains groups who occupied Pictograph and Ghost Caves.

The common ancestor scenario rests on the close resemblance of the earlier Mummy Cave specimens to contemporary coiling assemblages from the Eastern Great Basin. While the Mummy Cave coiled basketry sequence does not extend nearly as far back as those represented at Hogup (Aikens 1970) or Cowboy Caves (Geib and Jolie 2008; Jennings 1980), the congruence of coiled technologies is unmistakable. In this perspective, the Ghost Cave and other Northwestern Plains coiling represent the technological “progeny” of a widely distributed Archaic basketry milieu and tradition.
which cross cuts several environmental zones and, perhaps, linguistically and genetically unrelated populations.

While it is presently impossible to choose between either of the options presented above, it is possible to categorically dismiss a third potential vector for the Ghost Cave coiled specimen. The excavations of level IV at Pictograph Cave produced a small number of Intermountain Ware pot sherds. Over a thousand more examples of this type were located on the terrace outside the cave (Figure 2.2; Mulloy 1958:82). Mulloy (1958:199) posited that this ceramic type was associated with the spread of the Numic speakers, notably the Shoshone, into the study area. In this scenario, the producers of the coiling at Ghost Cave may have been one or another Numic speaking group.

Suffice to note that while the Shoshone, the most likely Numic-speaking candidate group, did possess an extensive perishable artifact repertoire, their basketry industry does not nor apparently ever has included coiling of the types represented at Ghost Cave or elsewhere in the Northwestern Plains. Indeed, Numic basketry is dominated by highly distinctive twining (Fowler and Dawson 1986), none of which was recovered from Ghost or Pictograph Caves.

It is suggested that Ghost Cave was inhabited by Beehive Complex groups who maintained far-reaching contacts based on their comparatively rich material cultural (Davis et al. 1994). The inferred temporal range for the Beehive Complex is A.D. 400 to A.D. 1150, which is partly coeval with the basketry dates and Fremont time period (e.g., Fredlund 1988:178). Beehive Complex sites are concentrated in southeastern Montana and northern Wyoming, including the Bighorn Basin (Davis et al. 1994; Fredlund 1988; Frison 1991:112-115). Thus, a Beehive Complex group could have come into contact
with Fremont groups or other intermediary peoples who then brought a coiled parching tray to Ghost Cave. Coiled basketry, however, was not found at other Beehive Complex sites, including those with cribbed log house ruins (Davis et al. 1994).

**Paint Applicator – Pictograph Cave**

One paint applicator (Figure 2.6) was found in Pictograph Cave III. The applicator (UM accession No. 2009-05-01, 1885) is made of either cottonwood (*Populus* sp.) or sagebrush (*Artemisia* sp.). It has been peeled and is both smooth and round in cross-section. It measures 84.6 mm in length and 9 mm in diameter. About two-thirds of the specimen (48 mm) is split longitudinally as a result of weathering. Red pigment covers 20 mm at one end of the stick. The applicator is described in detail by Mulloy (1958:70) as follows:

A peeled branch forty-five hundredths of an inch in diameter and three and a half inches long has one end roughly broken off while the other has been shredded to fibers, probably by chewing, and is stained with red pigment. Such a brush would have served well in painting the pictures found on the walls of the cave…

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**Figure 2.6. Paint applicator from Pictograph Cave.**
At 25-power magnification, the artifact displays a back and forth use wear pattern that created the fibrous end of the tool. Sand is also deeply (2-3 mm) embedded into the fibers, indicating that pressure was applied to the applicator on a sandstone surface to break the fibers apart (Peter Kolb, personal communication 2012). This evidence suggests that the applicator was used to paint red images on the back wall of Pictograph Cave, as opposed to being used to paint arrow shafts, hide parfleches, or other transportable items. The applicator was likely used to paint some of the biographic style images in Pictograph Cave, although apparently not the famous red-painted flintlock guns found in the cave since guns arrived on the Plains sometime after 1700 (Keyser and Klassen 2001:239).

A conventional radiocarbon age of $310 \pm 30^{14} \text{C yr B.P. (Beta - 316356)}$ was obtained on the paint applicator. At two-sigma calibration probability generated with a modified Groningen computer program (Talma and Vogel 1993), using the calibration data set INTCAL09 (Reimer et al. 2009), the specimen would date to approximately 1480-1650 cal A.D. or near the end of the Late Prehistoric period (Table 2.1).

Mulloy (1958:69-70) described a second possible paint applicator from Pictograph Cave III. It has a smooth surface and is also ground and painted on its distal end. Mulloy alternatively suggested that this might be an arrow shaft fragment as opposed to a paint applicator. The notching on the non-rounded end suggests this functional assignment is more likely correct. This specimen is not in the University of Montana collection and was unavailable for comparative study.
Prehistoric paint applicators discovered at a handful of other archaeological sites on the Northwestern Plains are useful for comparative purposes. Daughtery Cave produced a wooden stick that was heavily laden with pigment on one end (Frison 1968:278). Spring Creek Cave in the Bighorn Mountains of Wyoming produced two Late Prehistoric wooden paint applicators (Frison 1965:90, Figure 9h, i). Both are made on relatively short (about 7 to 8 cm), tapered pieces of shredded twig (species are not identified). One (h) is impregnated with red pigment and the other (i) with black pigment. The Spring Cave site yielded a date of 1725 ± 200 ^14C yr B.P. Frison (1965:94) attributed this occupation to Late Middle Prehistoric hunting groups. Rock art is not present in Spring Creek Cave so the paint applicators were apparently used to decorate portable items. This perishable-rich site also yielded the center fragment of a coiled basket (Frison 1965:92), as previously discussed.

Two paint applicators (paint brushes) were recovered from Horned Owl Cave in the Laramie Mountains of central Wyoming (Gebhard et al. 1964). The items are minimally described as “two sticks (average diameter 1.4 cm; average length 9.4 cm) shredded at one end” (Gebhard et al. 1964:362). The plant species of the two sticks is not described. Neither was covered with pigment. However, Horned Owl Cave contained abundant rock art imagery, including shield figures, and the authors suggest that these items were used to apply pigment to the cave walls.

Excavations at Lookout Cave (24PH402) in the Little Rockies of Montana yielded a paint brush in which human hair attached to a stick served as bristles (Greer and Greer 2007b). In the Southwest, pigment covered yucca fiber found in Canyon De Chelley in Arizona apparently also served as an implement to apply paint either to transportable
items or to paint rock art (Lawrence Loendorf, personal communication 2012). Thus, it is possible that long-decomposed animal or human hair, or vegetal fibers were once attached to the Pictograph Cave, Horned Owl Cave, and similar paint applicators. Ethnographic information concerning rock art on the Plains is rare. By analogy, Northern Shoshone and Crow women painted portable parfleches but designs on shields were painted exclusively by men (Lowie 1956:81, 86).

Prehistoric paint brushes and applicators are rare on the Northwestern Plains, as well as other areas of the world, including France, where prehistoric paintings in cave sites are ubiquitous but few such perishable artifacts survive (Jean Clottes, personal communication 2012).

**Tinder Stick – Pictograph Cave**

Only one item that could be classified as a tinder stick was found in the excavations of both Pictograph and Ghost Caves. These artifacts are extremely fragile and most likely, either quickly decomposed or broke apart or were destroyed through use by the cave occupants. William Mulloy (1958:70) described a prehistoric tinder stick (Figure 2.7) found in level III as follows:

This object may be a tinder stick used in kindling fire. It is an unpeeled branch a half an inch in diameter. It was apparently originally part of a long branch a portion of which was shredded by scraping. The shreds adhere at the end of the now extant three inch unpeeled branch, and the central portion of the end of the branch from which they were shredded has broken off.

The specimen (UM accession No. 2009-05-01, 1876) is a small, rectangular fragment of either a Limber (Pinus flexilis) or Ponderosa pine (Pinus ponderosa) stick.
with a matting of shredded fibers at one end. The unpeeled stick fragment is 96.5 mm long by 12.2 mm wide, and is 7 mm thick. The distal end is split and broken. A matted clump of fibers at the proximal end is about 85.5 mm wide. This clump comprises several hundred shredded fibers ranging 1-2 mm in width. Individual fiber length was impossible to determine because they are so intertwined and the specimen is very fragile.

The pine specimen is shiny and saturated with pitch. It may be a piece of “fat” wood, created when a burning or fire-threatened pine tree emits large amounts of pitch as an emergency response (Peter Kolb, personal communication 2012). Saturated with pitch, such wood is an excellent fire-starter and does not easily decompose. Wood fire making equipment, including three juniper hearth sticks with spindle sockets, shafts and
foreshafts, were recovered from Pictograph Cave III (Mulloy 1958:66-67). Presumably, tinder sticks complimented this equipment and were essential to starting campfires, along with grass and other easily combustible tinder.

An uncorrected date of $957 \pm 27$ $^{14}$C yr B.P. (OxA-21513, #1876) was obtained on the tinder stick. At two-sigma calibration probability generated with the Oxcal computer program, using the calibration data set INTCAL09 (Reimer et al. 2009), the specimen dates to approximately 1022-1155 cal A.D. and fits within the Late Prehistoric period (Table 2.1).

Based on our literature review, there are no clear counterparts for the tinder stick in other rockshelters and caves on the Northwestern Plains. It is possible that the bark and grass bundles recovered from Level 3 in Mummy Cave, dated to A.D. 734, served as fire tinder (Husted and Edgar 2002:59, Plate 36:101, items a, d and Plate 37:102, item b). However, these shredded fibers possibly served as raw stock for cordage or other perishables. In Sorenson Rockshelter, a small thin wad of matted Juniper bark impregnated with an unidentified substance was found along with coiled basket fragments, cordage, and knotted fiber (Husted 1969:24).

Ethnographies indicate that the Northern Shoshone used dried grass and rotten wood as tinder when making fires (Lowie 1909:189). Among the Crow rotten sagebrush (Artemesia sp.) and buffalo dung served as tinder (Lowie 1956:92). The Blackfeet also used buffalo dung when far from other firewood sources (Ewers 1958:76). In any case, fire tinder is highly fragile, decomposes quickly, and was likely transported from camp to camp, especially during winter months when fire was more critical for warmth.
Hearth Stick – Pictograph Cave

Three slender sticks of juniper from Pictograph Cave used as fire starting equipment are termed hearth sticks (Mulloy 1958:66, Fig. 20, 1-3). Our analysis adds little to Mulloy’s thorough artifact description except to update its current condition. Like so many perishables from Pictograph Cave, this specimen shows spots of glue indicating it was used in an exhibit, likely decades ago. The most complete specimen (as shown in Figure 2.8; UM accession No. 2009-05-01, 1878) is described by Mulloy (1958:67) as follows (with metric measurements shown in parentheses added):

The most complete specimen is made of an irregular piece split from a log or branch. It is eleven and four tenths inches (28.9 cm) long and though irregular in cross-section averages about nine tenths of an inch (15.8 mm) in diameter. There are three complete spindle sockets on one side; one worn completely through, the other just begun, and another about half worn out. The sockets average about a half inch (11-13.4 mm) in diameter and are about two tenths (5 mm) of an inch apart. Each has a lateral outlet, a V-shaped groove cut into one side to allow burn material to fall upon the tinder. Two sockets show much evidence of charring while the third is only slightly charred; although it exhibits deep concentric striations. Possibly an attempt was made to clean this socket by rotating the spindle in it with some abrasive material. At the end is another socket which has been completely broken through and the hearth broken through its axis. On the reverse side is a single deep socket. Although little, if any, attempt seems to have
been made to smooth the hearth’s surface, many of the rougher edges seem to have been worn away by use.

AMS dating of the hearth stick yielded a conventional radiocarbon age of $520 \pm 30 \text{^{14}C yr B.P.}$ (Beta – 316357; Table 2.1). At two-sigma calibration generated with a modified Groningen computer program (Talma and Vogel 1993), using the calibration data set INTCAL09 (Reimer et al. 2009), the specimen dates to approximately 1330-1440 cal A.D., placing it within the Late Prehistoric period. The AMS date is several hundred years later than that of the previously described tinder stick. Assuming that the tinder stick was part of the fire-starting process and used with a hearth stick, it is possible that other hearth stick fragments found in Pictograph Cave are contemporaneous with it. However, hearth sticks were likely valued and transportable items.

Mulloy (1958) identified a number of hearth sticks in the Pictograph Cave collection. Twelve were made on bison phalanges (Cramer 2000:65). However, only three—all made of wood—are present in the University of Montana collection. Excluding our study specimen, the other examples are smaller and fragmentary. The whereabouts of the remaining artifacts is unknown.
A single hearth stick fragment found in Spring Creek Cave in the Bighorn Basin, dated to about A.D. 225 (Frison 1965:86, Figure 6g). Two hearth sticks were also identified in Daugherty Cave (Frison 1968:278). These artifacts date to the Late Archaic and Late Prehistoric periods and are made on small branches of juniper (*Juniperus sp.*) and lodgepole pine (*Pinus sp.*). Sorenson Cave also produced a hearth stick (Husted 1969). All hearth sticks from these sites are illustrated as small figures in the site reports and are minimally described, so comparisons are difficult. Lowie (1956:92) documents the use of fire drills and hearth sticks made of cottonwood (*Populus sp.*) and driftwood among the Crow. The presence of the hearth sticks in Pictograph Cave and in the Bighorn Basin region indicates that this method of fire making was widely used by Late Prehistoric Northwestern Plains groups.

**DISCUSSION**

This small artifact dating and comparative analyses project precludes extensive discussion of the cultural chronology of Ghost and Pictograph Caves. However, these data offer insight into specific aspects of their prehistory as discussed below.

**Artifact Preservation**

The number of archaeological sites across the Northwestern Plains containing perishable artifacts is small, especially when compared with the neighboring Great Basin region. Sites with a perishable artifact assemblage include Birdshead Cave (Bliss 1950), Bighorn Canyon caves (Husted 1969), Daugherty Cave (Frison 1968), Eagle Shelter (Chomko 1981, 1990), Ghost Cave (Mulloy 1958), Ludlow Cave (Over 1936), Leigh Cave (Frison and Huseas 1968), Mummy Cave (Husted and Edgar 2002; McCracken et al. 1978), Pictograph Cave (Mulloy 1958), Spring Creek Cave (Frison 1965), and
Wedding of the Waters Cave (Frison 1962). Numerous rockshelters investigated over some 50-years of academic- and CRM-spurred research have yielded extensive lithic and faunal assemblages but relatively few perishable items (e.g., Finley et al. 2005).

The occurrence of perishable artifacts in these sites is apparently a function of the preservation, cultural adaptation, and site use. Ghost and Pictograph Caves are located in the pine parklands region of southeastern Montana. The climate here is semi-arid. Bedrock geology consists of weakly consolidated, soft, silty sandstones and shales. The characteristic sandstone escarpments are prone to fracturing and erosion (Rapp and Hill 2006). Thus, environmental conditions are conducive to artifact encapsulation and preservation. Rockshelters in the arid Bighorn Basin to the south and in the pine parklands further east, including sites such as Ludlow Cave (Over 1936), contain perishable artifacts found under generally similar preservation conditions.

This preservation situation contrasts with the limestone-dolomite geology of the Rocky Mountain foothills and island mountain range region to the west and north of Billings (Howard 1964). In this region, the abundant limestone solution caves and shallow rockshelters are typically wetter and deposition (under most conditions) is significantly less. Perishable artifacts of fiber, wood, or hide rarely survive, although tools made of these items were surely essential hunting and gathering equipment. However, our general observation about preservation conditions should be tempered by the relatively few rockshelter and cave investigations occurring here, especially in Montana.

In Ghost and Pictograph Caves, perishable items are relatively common only during the Late Plains Archaic and Late Prehistoric periods. We stress that this temporal
distribution is doubtless a function of differential preservation and/or differential site use parameters as perishable artifacts are well documented in Western North America literally since the initial colonization of the hemisphere (Adovasio 2010, 2012; Adovasio et al. 2001, 2007).

Material Culture and Behavioral Inferences

The perishable artifacts discussed here from Pictograph and Ghost Caves date to the Late Prehistoric Period. During this time cultural groups on the Northwestern Plains, practiced a complex system of big-game hunting involving jumps, traps, and corrals, whose success depended on careful group orchestration and cohesion (Brink 2008; Verbicky-Todd 1984). This nomadic adaptation resulted in a proliferation of hunting-related archaeological sites, weaponry, and equipment across the Northwestern Plains. Archaeologists have consequently focused their studies on this “masculine” aspect of material culture, although many studies now deviate from this historical pattern (e.g., Frison et al. 1986; Keyser and Klassen 2001; Sundstrom 2002). Schwab’s (1987) inference that Ghost Cave was primarily used as an area to re-tool and stage communal hunts is a case in point. Similarly, in discussing his Bighorn Basin site excavations, Husted (1969:81-97) also focused on projectile points and chipped stone tools despite the recovery of an array of perishable artifacts.

The recovery of perishable artifacts dramatically expands the scope of archaeological inquiry and interpretation beyond what can be derived from “stones and bones.” Many of these items reflect prehistoric adaptations entirely unrelated to the hunt. Basketry at Ghost Cave indicates that people, presumably women, were gathering and parching seeds or other plants over a fire. Seeds were likely collected in and around the
caves and brought back for subsequent processing, parching, and consumption (or storage and transport). The scale of this activity may be limited, based on four surviving basketry fragments. However, such trays or containers were likely transported to other sites, with the remnant pieces at Ghost Cave reflecting only repairs and/or exhausted artifacts. Evidence that baskets were produced at Ghost Cave (i.e., construction material for foundations and/or stitches) is non-existent but basketry was clearly used by the cave occupants.

The paint applicator found in Pictograph Cave reflects another dimension of site use. An individual or individuals collected a cottonwood (*Populus sp.*) or sagebrush (*Artemesia sp.*) stick for use as a paint applicator, perhaps with animal or human hair attached. After the hematite paint pigment was prepared, the applicator was used to create rock art on the sandstone wall in Pictograph Cave. The paint was then applied with enough force to deeply embed sand grains into the wood fibers as images of shield-bearing humans, elk, and geometric designs were painted. It is impossible to know if the rock art was painted while cultural groups occupied Pictograph Cave or if it was painted as a separate event. In this regard, rock art application events are ambiguous as reflected at rock art sites such as Bear Gulch and Hellgate Canyon in central Montana (Keyser et al. 2012; Scott et al. 2000).

The tinder and hearth sticks indicate the importance of fire for cooking, warmth, and social interaction. The production of the tinder stick was likely carefully planned since “fat” wood was specifically selected for its pitch-quality and whittled down with a stone flake or tool. The pitch-infused shavings then easily started a fire when used in combination with a hearth stick. The hearth stick was made of wood selected for
sufficient hardness and density to withstand the friction of the drill needed to successfully create an ember. Whether men or women, or even children, collected the raw wood to make tinder and hearth sticks is unknown.

**CONCLUSIONS**

On the basis of our limited study, it is clear that perishable artifacts expand our understanding of aboriginal technology, subsistence, and ethnicity on the Northwestern Plains. Unfortunately, perishable artifacts are in short-supply largely due to preservation. The Ghost and Pictograph Caves collections thus provide a rare insight into hunter-gatherer behavior.

The four Ghost and Pictograph Cave artifacts in our analysis date to the Late Prehistoric period, between A.D. 606 and A.D. 1650. With the exception of the tinder stick, analogs for these specimens are found in a handful of dry caves in the Bighorn Basin of Wyoming and southeastern Montana (Finely et al. 2005; Frison 1962, 1965, 1968; Frison et al. 1986; Husted 1969). The most unique and culturally diagnostic artifact in our study is the coiled basketry fragment from Ghost Cave. As noted above, it is virtually identical to Fremont basketry from the Eastern Great Basin. How this specimen (and three other fragments that disappeared from the collection) and other coiled baskets from the Bighorn Basin came to be left in a handful of Northwestern Plains sites remains an intriguing archaeological problem. “Fremont-like” baskets may have been transported or traded (perhaps with other items such as gaming pieces) into this region from the northern periphery of the Eastern Great Basin and Fremont area. Conversely, coiling may represent a local continuation of a coiling tradition with very ancient but poorly documented roots on the Northwestern Plains. It may be stated with
certainty that the Pictograph Cave coiling is not consistent with Numic coiling and, hence, does not represent the posited late Numic expansion into this area (e.g., Butler 1981; Holmer 1994).

Our dating of three objects from Pictograph Cave provides absolute chronological reference points for these artifacts in an otherwise complex archaeological deposit. For this reason, the dates were deliberately obtained from Pictograph Cave III, the richest occupation level in the cave. Like Ghost Cave, the dates document intense (multiple and repeated) Late Prehistoric period occupations. It is unfortunate that the date from the paint applicator does not correlate with the prominent gun motifs painted on the back wall of Pictograph Cave. Also, the hearth and tinder sticks are not coeval in time. Nonetheless, these dates demonstrate the time of the Level III occupation. The dated objects furthermore highlight activities not often documented at Northwestern Plains archaeological sites.

Decades of archaeological survey continually fail to locate rockshelters or caves the size of Ghost and Pictograph Caves, emphasizing their uniqueness in this region. Their collections are worthy of extensive analysis and reporting, regardless of their problematic WPA provenience and condition. Limited testing and geoarchaeological study in Pictograph Cave and Empty Gulch may clarify Mulloy’s (1958) stratigraphic description. These data will eventually help to illuminate American Indian adaptations along the Yellowstone River and the pine parklands region of southeastern Montana. This knowledge will also enable Montana State Parks to expand its site interpretation of ancient American Indian lifeways at the caves and in Empty Gulch for park visitors.
ACKNOWLEDGEMENTS

The authors are grateful to Montana State Parks, a division of Montana Fish, Wildlife and Parks for their overall support and financial assistance with radiocarbon dating, including Chas Van Genderen, Roger Semler, Darla Bruner, Jarret Kostrba, and Doug Haberman. John Douglas and Bethany Campbell (University of Montana, Missoula) assisted with access to the Pictograph and Ghost Cave collections. Peter Kolb (University of Montana, Missoula) identified plant and tree species. Lawrence Loendorf, Jean Clottes, James Keyser, and Glade Hadden shared ideas and data concerning rock art and the Fremont culture in Montana. Halcyon LaPoint (Custer National Forest) shared information about a recent basketry discovery in the Beartooth Mountains of Montana. David Pedler (Mercyhurst University) reviewed a draft of the manuscript and provided useful comments. Eric Carlson prepared illustrations and Tim Urbaniak provided the photograph of Pictograph and Ghost Caves and information concerning cave stratigraphy. Marcel Kornfeld and two anonymous reviewers provided helpful comments that greatly improved the quality of the manuscript.

The senior author appreciates the review comments of her doctoral dissertation committee at the University of Montana, Department of Anthropology, including Drs. Rafael Chacon, Kelly Dixon, Douglas MacDonald, Anna Prentiss, and Richard Sattler.
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CHAPTER 3

INDIAN FORTS AND RELIGIOUS ICONS: THE BUFFALO ROAD
(Qoq’aałx ‘Iskit) TRAIL BEFORE AND AFTER THE
LEWIS AND CLARK EXPEDITION

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Abstract

The Buffalo Road Trail was used for centuries by Columbia Plateau Indians to access buffalo hunting grounds east of the Continental Divide. Peeled trees, rock cairns, and unique stone features represent archaeological signatures of the trail’s antiquity and demonstrate its extensive use. Ancient trails linked prehistoric camps and settlements and allowed for the diffusion of a variety of cultural items. From a landscape perspective, trails provide information relative to precontact travel, subsistence, trade, and warfare. Although significant to the indigenous people in the region, this and other trails were also used by European and American groups colonizing the American West over the past several centuries. Captain Meriwether Lewis, Jesuit missionary, Nicolas Point, and General John Gibbon were among those who traveled this well worn Indian road. Archaeological studies, oral histories and ethnographic and historical information underscore the importance of the trail to prehistoric, protohistoric, and historic people.

Key words: Meriwether Lewis, trails, landscape, trade, missionaries

In 1805 and 1806, the Lewis and Clark expedition traveled east, then west through what is now Montana as the Corps of Discovery journeyed from St. Louis to the Pacific Ocean and back again. The corps, which was comprised of 33 men, traveled over 7,000 miles (11,265 km) on foot and on horses, and in dugout canoes and pirogues in just over 28 months. The expedition collected and documented more than 200 plant and animal species. They informed President Thomas Jefferson that a Northwest Passage of exclusive river travel was an unfounded dream. The expedition’s trials, tribulations, and interactions with native peoples are the subject of hundreds of books and articles. The Lewis and Clark Trail is now a National Historic Landmark that winds its way across the United States from Missouri to the Oregon Coast.
Remnants of the Indian trails the explorers used to find their way still exist today. In what is now western Montana, the explorers followed a portion of what is known as the Buffalo Road Trail. The following study describes: 1) use of the Buffalo Road before and after Meriwether Lewis’ epic journey; 2) archaeological and historical sites and features found along the trail; 3) Indian groups that used the trail and tribal place names associated with it; and 4) theoretical approaches to interpreting trails and their associated features. Through the lens of landscape archaeology, the dynamic use of the trail—as a travel route, a trade route, and a war and raiding path—is examined from prehistoric to historic times using archeological, historic, and ethnographic evidence. Changes in social interaction, economics, and warfare are discussed along with their subsequent effect on indigenous people and their use of the Buffalo Road. Trail features are well suited to studying long-term changes that transcend a separation between prehistory and history providing a baseline for comparing the recent to the deep past (Lightfoot 1995:200).

The 2005 to 2006 Lewis and Clark Bicentennial commemoration offered an opportunity to document the Corps of Discovery’s journey across relatively pristine landscapes where portions of the original trail are still intact and untrammeled (e.g., Thompson 2005). During the Bicentennial, federal agencies investigated archaeological and historical sites within the trail corridor. These efforts also allowed agencies to incorporate tribal voices into the commemoration (Hoxie 2006). The Circle of Tribal Advisors, which included representatives of 41 modern-day tribal governments, worked to ensure that meaningful tribal involvement, histories and perspectives were included in national, state, and local Bicentennial events. The inclusion of tribal people shifted the focus of research during the commemoration from strictly what happened during the
expedition to who used the trail before the expedition and for what purpose and who used it afterwards. In essence, a layered cultural landscape approach was taken so that all facets of trail use over time were explored and so that the pre-Lewis and Clark place names for and meanings of this trail system would be included in the analysis and decision-making related to this part of the Lewis and Clark Trail network. Many realize (the author among them) that Lewis and Clark spent but a few days traversing trail segments that now hold their name; yet indigenous people spent centuries, if not millennia, carving the well worn “roads” the explorers so deeply relied upon during their journey (Moulton 1987:401, 1993:96).

While they traveled through what is now Montana, the expedition did not break new trail unless they were forced to. Instead, they used “existing roads” created by indigenous North Americans. The area of study in this paper focuses on a 74.5-mile (120 km) section of the Buffalo Road Trail that Meriwether Lewis followed east from the banks of the Clark Fork River in western Montana over the Continental Divide to the Great Falls of the Missouri in central Montana (Figure 3.1). Meriwether Lewis, accompanied by Nez Perce guides, mistakenly interpreted the word his guides called the Blackfoot River and the trail along it as “Cokahlarishkit” (Moulton 1993:88-89; Salish-Pend d’Oreille Culture Committee 2003). The actual Nez Perce words for the Blackfoot River trail are Qoq’aax ‘Iskit or “buffalo road,” or k’uysey’ne’iskit, which translated means “bison hunt trail.” The term Buffalo Road Trail, the name by which this American Indian trail is now commonly referred, is used in this paper.

The author conducted an archeological field study of the Buffalo Road Trail near the base and at the top of the Continental Divide on USDA Forest Service (Forest Service
Figure 3.1. Location of Buffalo Road Trail in western Montana (approximate locations of other Indian trails provided by Tim Ryan and Dave Schwab, EthnoTech, Inc., Polson, MT).

hereafter) land over a five-year period, which culminated in 2007, with the listing of this trail segment and its associated archaeological sites and stone features in the National
Register of Historic Places. The extensive history of trail use is presented here along with an examination of associated archaeological sites, including scarred trees, prehistoric campsites, rock cairns, and other unusual stone features.

**METHODS**

To document the history of the ancient Buffalo Road Trail, the author undertook an extensive literature review that included examining the following: editions of the Lewis and Clark journals (Moulton 1987, 1993; Thwaites 1905); Government Land Office (GLO) plat maps (1877-1925) and notes; historical journals of early Euroamerican explorers, missionaries and military officers; Nez Perce, Salish, Blackfeet, and Crow ethnographies (Ewers 1958; 1968; Fahey 1974; Haines 1955; Johnson 1969; Lowie 1935; Secoy 1992; Turney-High); and reports of previous heritage resource studies of the area (Brumley 1998; Deaver 1996; Ferguson 2002; Knight 1989; Light et al. 1994; Lahren 1997; Scott 1979a, 1979b, 1979c).

Based on these data and topographic maps on file at the Montana Historical Society (prepared by Robert Bergantino), the section of the trail under study was plotted on 7.5 minute series topographic maps. Once plotted, a corridor of approximately .25 miles (.4 km) was established on either side of the suspected trail route and previously reported archaeological sites were plotted on the map. The .5 mile-wide (.8 km) corridor was then intensively surveyed by the author and field assistants to determine where intact trail tread remained and whether additional sites and features existed within the corridor. It was assumed that prehistoric and historic Indian groups traveling along the trail would camp nearby (as indicated by the numerous Indian camps Meriwether Lewis observed along this trail in 1806) and that the .5 mile (.4 km) wide corridor would be a sufficient
catchment area for prehistoric and historic sites associated with trail travel.

Relatively little comparative literature describing what constitutes a human-made trail is available. For those working in the field, it is a challenge to know how to distinguish between trails created by American Indian people versus those made by homesteaders and sheep herders (Scott 2001:4–2). Although Bergantino's map and the GLO maps helped plot the trail location, on-the-ground trail evidence is more difficult to read and decipher. Previous trail study information (Davis 1980a; McLeod 1980; Loendorf and Brownell 1980; Platt 1992; Thompson 2005) and conversations with National Park Service historic trail specialists indicate that there is no reliable scientific way to differentiate between modern, historic, and prehistoric trails, particularly if trail use continued over long periods of time. Nevertheless, several inherent and distinctive features of prehistoric trails set them apart from more recent trail types:

1. Trail ruts featuring foot and travois tracks approximately 8 to 23 inches (20–60 cm) wide that run parallel to each other (human tread follows contours, game trails do not), with the number of ruts ranging from two to over a dozen.

2. Trees or bushes growing in a linear fashion because trees are able to establish themselves in the abandoned or exposed trail bed.

3. Prehistoric sites located adjacent to the trail.

4. Rock cairns located adjacent to the trail with the bottom rocks embedded in the ground and/or covered with lichen.
5. Scarred trees with their bark removed by American Indian groups who exposed and ate the cambium layer of the trees.

6. Place name references or references in oral traditions by Indian groups that once occupied the area and used the trail.

Following these guidelines, Forest Service archaeologists (including the author) surveyed and flagged the trail in 1999 and 2000 (Scott 2001). In many instances, the location of trail segments was speculative because historic use by hikers, Forest Service personnel, hunters, and cattle deepened trail ruts and obliterated features such as travois tracks and small rock cairns that once marked the ancient trail. Historical accounts indicate that large groups often traveled the trail at the same time and in these instances they usually followed secondary or alternate routes, which converged on Lewis and Clark Pass or on Cadotte Pass to the southeast. Because of this, the Buffalo Road Trail is best seen as more of a corridor of travel within which several alternate routes were possible. Trail segments immediately east of the Continental Divide are privately owned and were not examined as part of this study.

Subsequent to the trail survey, in 2000, the Forest Service enlisted members of the Tribal Historic Preservation Office (THPO) of the Confederated Salish and Kootenai Tribes to map the ancient trail using global positioning satellite (GPS) equipment (Scott 2001). Three years later, a Forest Service consultant provided further descriptive information about trail resources for inclusion in a National Register of Historic Places district nomination (Hall et al. 2006). Forest Service personnel (the author) also worked
with the Salish and Pend d’Oreille Culture Committee to document the ways in which their ancestors used the area and to determine whether researchers could access background tribal information on place names and oral histories.

**ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

Numerous archeological sites represented by chipped stone tools, projectile points, and debitage dating from the Middle Archaic through the Late Prehistoric period have been identified in the study area of the Upper Blackfoot River Valley (Aaberg 1985; Brumley 1998; Ferguson 2002; Knight 1989; Lahren 1997; Light et al. 1994; Scott 2001). The region’s prehistoric inhabitants mined Mississippian Madison Group limestone chert from local quarries located in the Avon and Blackfoot River valleys (Knight 1989; Napton 1965). Late Prehistoric period projectile points were recovered during Forest Service and Bureau of Land Management surveys conducted along the Upper Blackfoot River and along the Willow and Alice Creek drainages, both tributaries to the Blackfoot River (Knight 1989). Butchered bison bone excavated along the Blackfoot River some 30 miles (50 km) west of the study area (along the Buffalo Road Trail) yielded radiocarbon dates of approximately 1,000 years A.D. (Aaberg 1985), which suggests that bison did roam west of the Continental Divide. Captain Meriwether Lewis, in fact, noted bison dung as he traveled through this area on July 6, 1806 (Moulton 1993:96), confirming that herds penetrated the Continental Divide. For various Indian groups, buffalo were critical providing not only subsistence but robes, skins, and dried meat for exchange and barter (Ewers 1968; Fahey 1974; Haines 1955).

On June 30, 1806, the Lewis and Clark expedition reached Traveler’s Rest in the Bitterroot Valley near present-day Lolo, Montana. They rested there for three days and
then the corps split into two parties. William Clark’s group left to explore the Yellowstone River; Captain Lewis, along with 14 men, 17 horses, and five Nez Perce Indian guides, set out to explore the northernmost reaches of the Marias River, hoping to exert further territorial claim to the Louisiana Purchase (Moulton 1993). Lewis and his party set out July 3, 1806, travelling along the Bitterroot and then the Clark Fork River to its confluence with the Blackfoot River. The group traveled on a “road” that was considered by the Nez Perce to be a “well beaten track” (Moulton 1993:85). The Nez Perce only traveled with the explorers as far as present-day Missoula for fear of reprisal from their enemies the Atsina, Crow, Blackfeet, and Hidatsa Indians (Moulton 1993:90). The guides forewarned Lewis that these tribes would cut his party off, but the men elected to continue. The Nez Perce advised Lewis that, as he neared the ridge of the Continental Divide, the road forked and they should follow the left fork (Landers Creek) but that the right fork would also lead them to the Great Falls of the Missouri (Moulton 1993:85). The right fork crossed Cadotte Pass four miles (6.4 km) to the southeast (Johnson 1969; Stone 1913).

As Captain Lewis traveled east up the Blackfoot River, he noted five different abandoned Indian encampments containing between 11 and 32 lodges made of brush, bark, and sticks. Today, these rare structures are known as conical timber lodges or wickiups (Davis 2014; Davis and Scott 1987; MacDonald 2012). Lewis also observed the tracks of a returning war party of Minnetarees (Hidatsa) accompanied by “a large pasel of horses” (Moulton 1993:93). These horses were likely captured from the Salish, given the proclivity of Plains tribes to carry out raids on this group (Fahey 1974; Farr 2003; Point 1967; Turney-High 1937). On July 6, 1806, Lewis camped along Beaver Creek, just two
miles (3 km) west of present-day Lincoln, Montana. Here he observed an Indian camp with 32 abandoned lodges and signs of buffalo. The frequency and number of Indian camps visible from the trail clearly reflects the number and size of the groups using the Buffalo Road during the Late Prehistoric and Protohistoric periods.

On July 7, 1806, Lewis reached the top of the Continental Divide. From the top of the pass or “the gap,” as Lewis referred to it, he recognized Square Butte in the distance, a landmark he named in 1805 when the expedition was headed west to the Pacific Ocean (Moulton 1993:95). From the pass, the party descended the mountain and camped near its base, traveling a total of 32 miles (51 km) on horseback that day. The following day the group continued along the well worn trail and reached the “Medicine” (Sun) River (Moulton 1993:87). On July 13, 1806, they reached the Great Falls of the Missouri and on August 12, 1806, they reunited with William Clark and the remainder of the group.

The next documented visit by Euroamericans on the Buffalo Road came approximately 40 years after the visit by Meriwether Lewis when Jesuit missionaries, Father Nicolas Point and Father DeSmet, arrived in the Rocky Mountain region to establish missions among various Indian tribes (Scott 2001). Father Point, the official diarist, maintained detailed notes regarding the customs, dress, and interactions among Indian groups (Point 1967). Point converted many Salish (he refers to them as Flathead) Indians to Christian worship, although the Salish continued practicing traditional religious ceremonies as well. Father Point traveled with the Salish on 30-plus-day excursions to and from buffalo hunts east of the Continental Divide, traversing the Buffalo Road Trail (Point 1967). He commented on the importance of the buffalo to Indian groups for food as well as trading stock.
As fur traders set up posts throughout the West, Isaac Stevens the Governor of Washington Territory, sent out several parties in the early 1850s to explore and document a potential route for a transcontinental railroad and a military road. Men who led these expeditions along the ancient Indian road between 1853 and 1855 included James Doty and F.W. Lander along with Governor Stevens and Lieutenants Saxton, Grover, Mullan, and Donald. Lander’s Fork Creek, a drainage that trail travelers followed en route to Lewis and Clark Pass, was named after F.W. Lander. Based on their reconnaissance, Stevens favored the construction of a railroad route over Lewis and Clark Pass. Another route was chosen some 40 miles (64 km) to the south and the study area remains pristine (Brumley 1998).

In October 1871, General John Gibbon led a party up Alice Creek and over the Continental Divide to ascertain which route Meriwether Lewis had taken. After studying the trail routes over Cadotte and Lewis and Clark Passes, Gibbon determined that Lewis crossed the latter, as descriptions and compass bearings for the area matched Lewis’ journal entries for July 7, 1806. Gibbon noted the terrible weather conditions on the October day he crossed the divide, remarking that he was so cold he stopped to build a fire (Gaff and Gaff 1994).

Gold was discovered in Lincoln Gulch in 1865. By 1871, more than 3,000 people lived in what is now the town of Lincoln, Montana. Among the numerous and relatively sudden landscape changes during this time, modern road networks rapidly developed, connecting burgeoning settler communities. Soon the ancient Indian road along the Blackfoot River became a stage road, and wagon ruts replaced the original travois tracks. By the 1890s, homesteading, ranching, and trapping followed on the heels of the mining
boom that played out quickly. Homesteads were subsequently established in the Alice Creek Valley near the ancient Indian road. In fact, the barn of the Patterson Ranch, located mid-way up the Alice Creek drainage, straddled the ancient trail. In the early 1900s, the Patterson family reported seeing Indian people (tribal affiliation apparently unknown) still traveling along the Buffalo Road. Alberta Patterson established a homestead near Cadotte Pass, south and east of her father's homestead, and reported that one day while she was picking service berries, she observed a band of Indians with horses and travois’ traveling along the trail over the pass (Upper Blackfoot Valley Historical Society 1994:247, 249). In 1920, the Forest Service built a guard station at the head of the Alice Creek drainage just below Lewis and Clark Pass (Scott 2001). The guard station was removed in 1970.

**DESCRIPTION AND INTERPRETATION OF TRAIL SITES AND FEATURES**

A network of trails marked the Upper Blackfoot River Valley and Continental Divide during prehistoric, protohistoric, and historic times (Salish-Pend d’Oreille Culture Committee 2003). The Buffalo Road Trail and the features and sites along it (collectively recorded as site 24LC1211) are viewed as part of a landscape continuum--the 4.97 mile (8 km) section presented here is a sample of a much more extensive landscape feature. Often it is difficult to determine where trails start and end because they were connected to one another over millennia and by their nature often have no beginning or end (Snead et al. 2009a:2). Trail tread is still visible in many locations within the Alice Creek drainage (Figure 3.2). Trail ruts follow natural landscape contours in contrast to game trails which generally climb vertically. In many instances, tracks of parallel tread are evident, most
Figure 3.2. Location of sites and features along the Buffalo Road Trail (based on Hall et al. 2006; Scott 2001).
<table>
<thead>
<tr>
<th>Site No./Feature No.</th>
<th>Site/Feature Type</th>
<th>Size/Feature Dimensions</th>
<th>Time Period (Based on Lichen Dating, Projectile Points, Tree age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24LC250</td>
<td>Lithic Scatter</td>
<td>5 acres</td>
<td>Late Prehistoric</td>
</tr>
<tr>
<td>24LC417</td>
<td>Rock Cairn (No. 1)</td>
<td>46 cm diameter, 30 cm in height</td>
<td>Historic</td>
</tr>
<tr>
<td>24LC417</td>
<td>Rock Cairn (No. 2)</td>
<td>1.4 m in diameter, 45 cm in height (est.)</td>
<td>Late Prehistoric</td>
</tr>
<tr>
<td>24LC418</td>
<td>Stone Fort (No. 1)</td>
<td>4 m in diameter, 65 stones, 40-80 cm in size</td>
<td>Late Prehistoric</td>
</tr>
<tr>
<td>24LC418</td>
<td>Stone Fort (No. 2)</td>
<td>3.5 m in diameter, 55 stones, 40-80 cm in size</td>
<td>Late Prehistoric</td>
</tr>
<tr>
<td>24LC1015</td>
<td>Lithic Scatter</td>
<td>10 acres</td>
<td>Late Archaic/Late Prehistoric</td>
</tr>
<tr>
<td>24LC1016</td>
<td>Cross</td>
<td>Base 1.6 m in length, entire feature 3.48 m in length, stones 10-25 cm in size</td>
<td>Historic</td>
</tr>
<tr>
<td>24LC1211</td>
<td>Trail</td>
<td>8 km in length</td>
<td>Late Archaic/Late Prehistoric</td>
</tr>
<tr>
<td>Feature 1</td>
<td>Scarred Tree</td>
<td>30 cm in length, 13 cm wide</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 2</td>
<td>Scarred Tree</td>
<td>3 m in length, 28 cm wide</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 3</td>
<td>Rock Cairn</td>
<td>1 m in diameter, 75 cm in height</td>
<td>Historic</td>
</tr>
<tr>
<td>Feature 4</td>
<td>Rock Cairn</td>
<td>1.37 m in diameter, 17 stones</td>
<td>Historic</td>
</tr>
<tr>
<td>Feature 5</td>
<td>Scarred Tree</td>
<td>2 m in length, 30 cm wide (estimated)</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 6</td>
<td>Scarred Tree</td>
<td>70 cm in length, 40 cm wide (estimated)</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 7</td>
<td>Scarred Tree</td>
<td>13-18 cm in length, 40 cm wide (estimated)</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 8</td>
<td>Rock Cairn</td>
<td>1.5 m in diameter, 10 cm in height, 15 stones</td>
<td>Historic</td>
</tr>
<tr>
<td>Feature 9</td>
<td>Rock Cairn</td>
<td>1.4 m in diameter, 20 cm in height, 20 stones</td>
<td>Protohistoric/Historic</td>
</tr>
<tr>
<td>Feature 10</td>
<td>Rock Cairn</td>
<td>60 cm in diameter, 9 stones, stones 13-35 cm in size</td>
<td>Historic</td>
</tr>
<tr>
<td>Feature 11</td>
<td>Stone Hearth</td>
<td>1.8 m in diameter, 25 stones, stones 10-40 cm in size</td>
<td>Historic</td>
</tr>
<tr>
<td>Feature 12</td>
<td>Rock Cairn</td>
<td>1.5 m in diameter, 65 cm in height, 65 stones</td>
<td>No Data</td>
</tr>
<tr>
<td>Feature 13</td>
<td>Rock Cairn</td>
<td>2.2 m in diameter, 10 stone, 10-30 cm in size</td>
<td>No Data</td>
</tr>
<tr>
<td>Feature 14</td>
<td>Rock Cairn</td>
<td>1.5 m in diameter (estimated), 1.3 m in height, 30 stones, stones 10-40 cm in size</td>
<td>No Data</td>
</tr>
</tbody>
</table>

Table 3.1. Sites and features along the Buffalo Road Trail (based on Hall et al. 2006; Scott 2001).
likely created by groups traveling together in side-by-side fashion instead of single file. 
Approximately 3.97 miles (6.4 km) of intact trail tread was identified (Figure 3.2). The 
remaining portions of the trail are too disturbed or over-grown to positively identify trail 
tread.

Beside trail tread, other features mark the path of the Buffalo Road including rock 
cairns, scarred trees, two stone structure sites, and two large buried prehistoric campsites. 
These are discussed in a broader context below. Figure 3.2 shows the location of features 
and sites; Table 3.1 provides data specific to each site and feature. Interpretive 
possibilities are provided below along with comparative information found elsewhere.

**Rock Cairns**

Ten rock cairns are associated with the portion of the trail that is located on public 
lands within the Alice Creek drainage and on top of Lewis and Clark Pass (Figure 3.2, 
features 3, 4, 8, 9, 10, 11, 12, 13, 14 and site 24LC417). One fire hearth (feature 11) was 
located on top of the pass and is comprised of stones piled in a small circle. A typical 
rock cairn is shown in Figure 3.3. An abundance of cairns are also documented along trail 
segments approximately 10 miles (16 km) to the west of the study area along Lander’s 
Fork (Light et al. 1994).

As described in a handful of trail studies including the Bad Pass Trail in 
Wyoming (Loendorf and Brownell 1980), the Nez Perce Trail in Idaho (United States 
Forest Service 1982), and the Lolo Trail (McLeod 1980) in Montana, rock cairns 
commonly mark the path of prehistoric and historic trails (also see Malouf 1962). Over 
170 rock cairns were found along a seven-mile (11.2-km) segment of the Bad Pass Trail 
(Loendorf and Brownell 1980). Loendorf and Brownell suggest that rocks were cleared
from the path as people traveled it, casting stones of all shapes and sizes onto existing piles. Rocks may also have been cleared to protect the unshod hooves of horses and to make travois travel smoother and easier (Loendorf and Brownell 1980:73). Ewers (1980:138), suggests that the travois load limit for small Indian horses was 300 pounds and a smoother route without innumerable rocks made the “pull” that much easier. Many cairns were likely created to mark the path and direction of the trail.

Excavation of 16 rock cairns along the Bad Pass Trail in Wyoming revealed that 10 of the cairns contained pieces of bison bone, charcoal, juniper wood, pottery, and chipped stone artifacts. Offerings placed inside or on top of the cairns possibly ensured success in a journey or hunting pursuit. Several historical references support the use of cairns as “altars” or offering locations (Loendorf and Brownell 1980:75). Lewis and Clark made note of such a practice as they traveled along the Lolo Trail in the Bitterroot Mountains of Montana with Nez Perce guides. Lewis noted that, on a mountain top, his
Nez Perce guides requested a halt and built a stone cairn where they sat and smoked “the pipe” before proceeding on (Moulton 1993:55-56). Fowler (2009:91) notes that the Chemehuevi Indians of the Mohave Desert added rocks and twigs of creosote to rock cairns as offerings to be “refreshed” from the exertion of travel. Artifacts found within a cairn on Bad Pass Trail—with a radiocarbon date of A.D. 350 ± 27 years—indicates that cairns were used late in prehistory as trail markers and/or as offering locations (Loendorf and Brownell 1980:75).

**Scarred Trees**

Five features (Figure 3.2; features 1, 2, 5, 6 and 7) along the 4.97-mile (8 km) Buffalo Road Trail segment include culturally modified trees. Two of these appear to be trail blazes left by historic visitors or created by fire. Many others were most likely present but were logged early in the twentieth century or burned in wildfires. Meriwether Lewis commented on the expedition’s practice of marking (“blazing”) trees as they crossed the Bitterroot Mountains of Montana (Moulton 1993:56). Some of the larger tree scars are the result of Indian groups peeling back bark to expose the cambium layer. Cambium was eaten by a variety of Indian tribes (Arno et al. 2008; Josefsson et al. 2012; Mobley and Eldridge 1992). The scars range in size from 9.84 feet (3 m) in length to 11.81 inches (30 cm) in width and are found at the base of the tree (Table 3.1, Figure 3.4). Trees species selected for peeling along this trail segment are predominately exclusively ponderosa pine (*Pinus ponderosa*).

In timbered mountain landscapes throughout the Pacific Northwest, hundreds of trees bear scars from aboriginal use. According to White (1954) and others (Arno et al. 2009; Josefsson et al. 2012; Mobley and Eldridge 1992), Indian people peeled away the
soft inner, cambium layer of trees in the spring when sap was at its height and ate what was extracted. Various tree species were used including spruce (*Picea sp*.), lodgepole pine (*Pinus contorta*), and ponderosa pine (*Pinus ponderosa*). The scars left on peeled trees are unlike those made by fire, lightning strikes, or animals (Arno et al. 2008:57). Tree scars usually range from 3.9 to 11.8 inches (10 to 30 cm) in width and can be over 3 feet (.9 m) in length. Numerous scarred trees are located on the Flathead National Forest in northwestern Montana and along the Lolo Trail and on the shores and islands of Flathead Lake (e.g., McLeod 1980). Tree boring information from 13 peeled trees on Wild Horse Island on Flathead Lake indicates that the oldest living tree on the island began growing in 1711 (Scott 2009). Trees were also peeled to feed horses, as was done by Chief Joseph and his Nez Perce band during their escape from the U.S. Army following the Battle of the Big Hole in 1877 (White 1954).
William Gingros, a Kootenai Indian from Pablo, explained how bark peeling was usually done after the first Sunday in May, when the tribes began gathering bitterroot bulbs (White 1954). Salish and Kootenai Indian elders told White in 1954 that trees were selected for stripping near campsites or along trails. A wooden debarking tool, approximately the size of an axe handle, was used to split the outer bark away from the tree. The Salish and Kootenai also used pieces of tin cans to peel trees when available. Generally speaking, common woodworking tools including the axe, chisel, adze, maul, and wedge were also used to peel trees (Mobley and Eldridge 1992:101). The practice of bark peeling ceased when sugar became available to American Indians, but made a short comeback during World War I, when sugar was unavailable. The Bureau of Indian Affairs stopped the bark-peeling practice because they felt it harmed the trees. However, the fact that peeled trees still thrive today indicate that sufficient bark was purposefully left to ensure their survival (Arno et al. 2009).

**Occupation Sites**

Few stable land surfaces exist in the Alice Creek drainage because the creek has meandered across the narrow drainage bottom over time. However, two large Native American encampments are preserved along the 4.97-mile (8 km) trail segment. Adjacent to the creek, chipped stone tools and flaking debris are scattered along the sagebrush flats. Two prehistoric sites lie on either side of the base of the Continental Divide (Figure 3.2). One site (24LC1306), situated on the east side of the divide is located on a privately owned ranch. Paleoindian projectile points found at the site during archaeological excavations in advance of the construction of a fiber optic telephone line indicate the
site’s great antiquity (Lahren 1997). Interestingly, this site lies along the suspected path
of the Old North Trail which extended from Canada to Mexico, flanking the eastern
Rocky Mountain Front (Figure 3.1, also see McClintock 1910; Reeves 1990; Stark 1997).
This trail is believed to hold great antiquity and its proximity to Paleoindian campsites
helps support this.

Another large prehistoric site (24LC1015) lies on Forest Service land on a large
bench on the west side of the divide. Archaeological excavations in 2001 revealed some
700 chipped stone flakes, spalls, and core fragments (Ferguson 2002). Recovered
temporally diagnostic artifacts included Late Archaic corner-notched and Late Prehistoric
side-notched projectile points. Over the past 30 years, Forest Service employees have
collected chipped stone scraping and cutting tools, projectile points, an incised bone
bead, and chipped stone flakes from the site surface. In addition, the two roads bisecting
the site continually expose pieces of charcoal, burned bone, fire-cracked rock and
chipped stone artifacts. When the site was first recorded in 1975, bison skulls and bones
were observed eroding from the banks of Alice Creek. The presence of bison bone
indicates they were killed or butchered at this location. Most likely, archaeological site
24LC1015 served as a staging station for incoming and outgoing buffalo hunting trips
east of the Continental Divide (Scott 2001:5–1). Chipped stone artifacts were also found
at archaeological site 24LC250, located on top of Lewis and Clark Pass (Figure 3.2). Test
excavations conducted at the site resulted in the recovery of Late Prehistoric projectile
points and scraping tools (Lahren 1997). As has happened at most archaeological sites in
the vicinity of Lewis and Clark Pass, artifacts have no doubt been collected by hikers,
hunters, and visitors to this popular recreation area that offers a stunning view of the central Montana Plains.

**Stone Forts**

Two collapsed stone features on top of Lewis and Clark Pass (24LC418) are interpreted to be stone forts based on Salish and Pend d’Oreille oral histories and comparisons with similar features in the Pacific Northwest. The structures could also be interpreted as vision quest features but their shape and associated traditional place name do not support this interpretation. The structures are located approximately 984 feet (300 m) above the pass and are much larger than the rock cairns found along the trail (Hall et al. 2006:11). Structure No.1, which includes 65 stones ranging in size from 15.75 to 31.5 inches (40 to 80 cm) is somewhat circular and is formed by two roughly concentric circles (Figure 3.5, Table 3.1). The stones are sodded into the earth and heavily covered with lichens. Structure No. 2, located approximately 213 feet (65 m) northwest of No. 1, is comprised of approximately 55 stones and is similar in shape to the structure No. 1, but is slightly smaller and composed of fewer stones (Hall et al. 2006:11). The structure is also heavily sodded in and lichen-covered.

From a landscape perspective, the stone fort features found along the Buffalo Road Trail are uniquely and strategically placed on a ridge above Lewis and Clark Pass where the trail (and people) crossed the Continental Divide (see Figure 3.2). The features differ from rock cairns in that the stones used were larger, more numerous and heavier. It also appears as if the structures are collapsed and that they were used long ago because the stones that comprise them are deeply embedded in the ground. When first recorded in
1979, the function of the features was uncertain (Scott 2001). However, their function was immediately apparent after tribal place name information was obtained.

Consultations with the Salish-Pend d’Oreille Culture Committee indicates that the place name for Lewis and Clark Pass is “Smitu Sxʷcuʔsi” or “Indian Fort Pass, a place where warriors would sit in small stone structures to watch for approaching Blackfoot raiders” (Salish-Pend d’Oreille Culture Committee 2003; Salish-Pend d’Oreille Culture Committee and Elders Cultural Advisory Council 2005:54). Based on the morphology and configuration of the two circular stone structures, their use as forts is easy to envision. The location of the features provides a bird’s-eye view of people approaching
from the Plains and of people crossing over the pass. The usefulness of oral tradition relative to archaeological interpretation is documented in a number of studies (Aporta 2009; Schaepe 2006; Zedeño et al. 2009, 2010), and the current investigation of the Buffalo Road Trail further supports the importance of oral histories to contemporary archaeological inquiry.

Comparative studies of stone fort structures include Schaepe’s (2006) study of Salishan socio-political networks, where he uses the material remains of forts and defensive features to document persistent warfare along the Fraser River in British Columbia. Dates from forts in this study indicate that defensive structures were built over 1,000 years ago, suggesting warfare was prevalent long before colonial influence. Working with contemporary people who speak the traditional language, Schaepe gathered a variety of place names for the fort features. Translations of fort names include “to defend from coastal raiders” and “lookout for enemies.” Schaepe identified four defensive structure types with construction dependent upon local resource availability (i.e. boulders), landscape morphology, and the severity or need for defense. On the basis of his study, Schaepe (2006:701) suggests that the fortifications “act as overt signs of power, prestige, and authority … acting constantly to define territory, ownership, and rights.” Oral history and place name information was critical to the conclusions Schaepe made about the function and use of various stone structure sites.

In their work on the Northern Pacific Coast, Moss and Erlandson (1992) identified numerous historical and ethnographic references to forts, refuge rocks, and defensive sites. Generally situated on elevated landforms with panoramic views, the forts as well as an abundance of war clubs, daggers, and human remains found in
archaeological contexts led Moss and Erlandson (1992:73) to hypothesize that there was organized and extensive warfare among Pacific Coast peoples. Radiocarbon dates from artifacts found in association with 20 of the forts showed that most were used between A.D. 900 to A.D. 1400, indicating a long tradition of warfare during the Late Prehistoric Period that continued into historic times.

**Stone Cross**

The most unique rock feature on Lewis and Clark Pass is a stone cross (24LC1016) that lies just 10 feet (3 m) south of the Buffalo Road Trail (Figures 3.6, Table 3.1). Originally recorded in 1975 as two stone features, only one stone feature now exists that clearly resembles the shape of a Celtic cross. Hall et al. (2006:14) describe it as follows:

> It is comprised of a cross with a circle around the center, and a flat base with a half circle. The center circle encompasses the arms and upper portion of the main trunk. The flat bottom of the structure has six stones that form the base of the structure, 15 larger stones that form the main trunk, approximately 20 smaller stones forming the half circle at the base, 12 stones forming the arm, and 29 small stones forming the center circle.

The base of the cross measures 5.24 feet (1.6 m) in length as shown in Figure 3.7, and the stones that comprise the cross range in size from 7.87 to 15.74 inches (20 to 40 cm). The trunk measures 11.41 feet (3.48 m) in length with stones that range in size from 3.93 to 9.84 inches (10 to 25 cm).

The origin of the stone cross located on top of Lewis and Clark Pass is debatable. One plausible explanation is that it was constructed by Father Nicholas Point, the Jesuit
priest from St. Mary's Mission in the Bitterroot Valley. On September 28, 1842 during a buffalo hunting venture with the Salish, Point wrote, that they reached “the summit of a

mountain from which one could see a horizon more than a hundred leagues [one league is the equivalent of 4.83 kilometers or 3 miles] in circumference, after reciting the first Vespers of St. Michael, I made and planted a cross … for we were in the middle of Blackfoot Country” (Point 1967:174). Point is very likely referring here to Lewis and Clark Pass and its sweeping view of the Plains from the pass. His statement that a cross “was planted” may indicate the cross was constructed of wood, rather than from a series of stones. However, trees are scarce on top of the pass--consisting of extremely stunted

Figure. 3.6. Photograph of stone cross (24LC1016) along Buffalo Road in 1980s.
and twisted whitebark pine—and stones are plentiful, making stones the easiest and most accessible building material. The reference reflects that early missionaries left Christian
icons as they traveled through new territory, both as a form of prayer and as a way of introducing their preferred method of worship (Scott 2001:5-8). Lichenometric data collected by Hall (2005) and discussed in the following section provides an additional line of evidence supporting that the stone cross was constructed in the 1840s.

During his trips with the Salish, it is worth noting that Point observed how the Crow and Blackfeet taunted the Salish and continually “stole” their horses. He described the Salish as a gentle people who practiced ethical judgment. While traveling with the Salish in 1842, Point witnessed the Salish extend kindness towards their enemies, the Blackfeet. In meeting up with a Blackfeet group during the hunt, the Salish invited them to smoke a pipe as an offer of friendship. Point states that the Salish “thought of only receiving them in friendship, those who had RAIDed so mercilessly. Hands were shaken in sign of reconciliation, a dance was held, the calumet [pipe] was smoked . . . just as if relations had always been friendly” (Point 1967:158).

AGE OF THE BUFFALO ROAD TRAIL

Based on current archaeological evidence, the Buffalo Road Trail was used for at least 1,000 years and probably longer (e.g., Aaberg 1985; Ferguson 2002; Knight 1989). Thus, it provides an opportunity to study the region’s Late Prehistoric Period and is key to understanding the complex transition to protohistoric and historic times (e.g., Lightfoot 1995). Large prehistoric camps (24LC250, 24LC1015, and 24LC1306-on private land) at the base and on the top of the Continental Divide reflect the antiquity of the Buffalo Road. Projectile points from the Late Archaic and Late Prehistoric periods found at these
sites indicate the long use of the trail, including during “dog days” before horses were acquired on the Plains and dogs served as beasts of burden (Ewers 1958, 1968).

As part of the trail study and its associated stone features, an effort was made to use lichen analysis to date features found in earlier studies (Hall 2005; Scott 2001). Lichenometry assumes that colonization of lichens occurs over predictable periods of time, thus providing a growth rate for specific species. Lichenometric analysis is used to date human-made monuments as well as natural features. Geologists use lichenometric analysis to establish glacial chronologies, rock fall frequencies, fault ages, and earthquake recurrence intervals (Benedict 2009). Lichenometric analysis was successfully used as a dating method in archaeological studies in the White Mountains of California (Bettinger 1991) and in the Colorado Front Range (Benedict 2009). Clearly, archaeological features made of stone, such as house features and rock alignments, are most suitable to this type of dating and provide the most reliable dates.

More than 3,600 lichen species grow in North America, and approximately 90 percent of published studies use the genus *Rhizocarpon*, as employed by Hall (2005). One of the major concerns about lichen growth and survival is that they can be killed by heavy and perpetual snow but *Rhizocarpon geographicum* is one of the most snow-tolerant species (Benedict 2009:151). *Rhizocarpon* grow faster in moist environments and show a clear preference for polar, alpine, and other cool temperature environments (Benedict 2009:148). Fire, however, threatens lichen longevity and after intense fires, where an abundance of fuel is burned, the lichenometric clock is reset to zero.

In this study, the lichenometric analysis focused on various stone features within the Alice Creek drainage and followed standardized methods (Armstrong 2001; Benedict
In order to establish a growth rate, the lichens on headstones in the nearby Lincoln Gulch Cemetery (associated with the Gold Rush-era old Lincoln townsite) were examined. Two lichen species were found on the oldest headstone—that of Minnie Neal who died in 1869—*Rhizocarpon geographicum* and *Lecanora rupicola*, and were used to define growth rates for the general area (Hall 2005:19). Hall’s method of using an 1869 headstone to establish a calibration rate is considered reliable and in fact preferable by experts working in the field (Benedict 2009). For the various stone features, lichen species were identified using standard identification keys and spot testing (Armstrong 2001). When specific chemicals are applied to certain lichen, they change color, which can correctly identify the lichen's genus and species. For each stone feature included in the analysis, five measurements were taken for each lichen species. The measurements were taken from different stones comprising each feature and then compared with measurements taken from the 1869 headstone at the Lincoln Gulch Cemetery (Hall 2005:18).

Lichenometric analyses were conducted on four rock cairns (features 4, 8, 9, 10) and the fire hearth (feature 11) found along the trail and on two stone feature sites (24LC418 and 24LC1016). The location of these features is shown in Figure 3.2 and results are described below.

**Rock Cairns/Hearth**

According to the lichenometric analyses of rock cairns and the hearth adjacent to the trail, these features were constructed between 1767 and 1941 or during the Protohistoric and Historic periods (Table 3.2). Trail travelers most likely added stones to
Table 3.2. Lichenometric dates for stone features along the Buffalo Road Trail (based on Hall 2005).

<table>
<thead>
<tr>
<th>Site No./Feature No.</th>
<th>Site/Feature Type</th>
<th>Lichen Species Analyzed for Dating</th>
<th>Lichen Dates (expressed as ±10 years)/ Other Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>24LC417</td>
<td>Rock Cairns (2)</td>
<td>Disturbed, no data collected</td>
<td>No Date</td>
</tr>
<tr>
<td>24LC418</td>
<td>Stone Forts</td>
<td><em>Rhizocarpon geographicum</em></td>
<td>1344, 1345, 1446, 1641, 1655</td>
</tr>
<tr>
<td>24LC1016</td>
<td>Stone Cross</td>
<td><em>Rhizocarpon geographicum</em></td>
<td>5 dates averaged to 1847</td>
</tr>
<tr>
<td>24LC1211</td>
<td>Trail</td>
<td>-</td>
<td>Late Prehistoric</td>
</tr>
<tr>
<td>Feature 3</td>
<td>Rock Cairn</td>
<td>Could not identify species, no data collected</td>
<td>No Date</td>
</tr>
<tr>
<td>Feature 4</td>
<td>Rock Cairn</td>
<td><em>Lecanora rupicola</em></td>
<td>1886, 1910, 1939, 1941, 1941</td>
</tr>
<tr>
<td>Feature 8</td>
<td>Rock Cairn</td>
<td><em>Lecanora rupicola, Rhizocarpon geographicum</em></td>
<td>1811, 1812, 1819, 1827, 1842, 1858, 1860, 1881, 1902, 1920, 1872, 1875, 1821, 1821, 1856, 1826, 1859, 1868, 1872, 1885</td>
</tr>
<tr>
<td>Feature 9</td>
<td>Rock Cairn</td>
<td><em>Rhizocarpon geographicum</em></td>
<td>1767, 1785, 1821, 1821, 1856</td>
</tr>
<tr>
<td>Feature 10</td>
<td>Rock Cairn</td>
<td><em>Rhizocarpon geographicum</em></td>
<td>1826, 1859, 1868, 1872</td>
</tr>
<tr>
<td>Feature 11</td>
<td>Stone Hearth</td>
<td><em>Rhizocarpon geographicum</em></td>
<td>1863, 1865, 1871, 1871, 1872</td>
</tr>
<tr>
<td>Feature 12</td>
<td>Rock Cairn</td>
<td>Disturbed, no data collected</td>
<td>No Date</td>
</tr>
<tr>
<td>Feature 13</td>
<td>Rock Cairn</td>
<td>Disturbed, no data collected</td>
<td>No Date</td>
</tr>
<tr>
<td>Feature 14</td>
<td>Rock Cairn</td>
<td>Disturbed, no data collected</td>
<td>No Date</td>
</tr>
</tbody>
</table>

cairns as they passed by, so the stones at the top are the most recently deposited and those at the bottom are the oldest (Hall 2005). Other studies also support this interpretation of cairn formation (Fowler 2009; Loendorf and Brownell 1980). The very early dates in Table 3.2 of 1767, 1785, 1811, 1812, 1819 and 1826, most likely reflect tribal use of the trail. It is possible that the two post-1900 dates (shown in Table 3.2) for features 4 and 8 may indicate adaptive reuse of the stone cairns by historic sheepherders or by the Forest Service (Hall 2005:27).

The lichenometric dates for the fire hearth (feature 11) cluster around 1870. This date is of interest given the documented visit by General John Gibbon, who crossed Lewis and Clark Pass in October of 1871 and built a fire because of inclement weather (Gaff and Gaff 1994). The clustered dates support the possibility that this was the fire hearth that Gibbon constructed. Tree ring dating was also conducted on the whitebark.
pine that grew inside the hearth. The tree boring samples indicate that the maximum age for the trees in this location is approximately 130 years (Hall 2005), which supports the lichenometric date.

Growth ring counts collected by Forest Service botanists from whitebark pine trees on the pass suggest that a stand-replacing fire event occurred approximately 140 years ago. The hearth and the adjacent stone cairn (feature 10) are located in a stand of even-age whitebark pine. Fire events such as the stand-replacing fire that occurred 130 to 140 years ago can also kill lichens if they are extremely hot (Benedict 2009:150). The combined tree ring analyses and lichen data indicate that fire affected both the whitebark pine and the lichens at this location. Therefore, any temporal assignments should be viewed with caution as the features may have been constructed immediately before or after the fire (Hall 2005:29). Although the lichen in the immediate area may have been killed by fire, the earlier dates for other cairns and features suggest the surrounding areas where these features were found were either unaffected by fire or that the fire was not hot enough to destroy the lichen.

**Stone Forts/Stone Cross**

The two stone fort structures are heavily sodded over and covered with lichen. Measurements of *Rhizocarpon geographicum* lichens establish calendar dates ranging from 1344 to 1655 (Table 3.2). The analyses indicate the structures date to the Late Prehistoric period and presumably reflect the antiquity of warfare along the trail on the Continental Divide long before the introduction of the horse and colonial influence. The date range also suggests that the features were rebuilt and reused over time.
Five measurements of *Rhizocarpon geographicum* were taken on stones forming the cross, then averaged because it was assumed that the structure was built all at once. The construction date of 1847 ±10 years closely matches the time that Nicolas Point documented his journey to hunt buffalo with the Salish, thus tentatively supporting the idea that the cross he mentioned constructing in his journals is this stone feature.

**NATIVE GROUPS ON THE BUFFALO ROAD TRAIL**

The Nez Perce, Salish, Spokane, Kootenai, and other Columbia River groups, including the Okanogan, were the predominant users of the Buffalo Road Trail (Fahey 1974; Haines 1955; Turney-High 1937). Groups traveled over the Continental Divide and onto the Plains of central and eastern Montana as many as three times a year to hunt bison. These excursions were generally made during the summer and fall. As a military tactic, the Salish often banded together with the Nez Perce and Pend d’Oreille to deflect conflicts with the Blackfeet, Crow, and Hidatsa (Ewers 1958, 1968; Fahey 1974; Haines 1955; Turney-High 1937). The Salish are thought to be the primary group that occupied the Blackfoot River Valley (Fahey 1974; Turney-High 1937). A band of Salish Indians remained in this river valley until 1891, when they were relocated to the Flathead Indian Reservation in the Jocko Valley (Brumley 1998). By the nineteenth century, the Blackfeet resided predominately in north-central and northeastern Montana whereas the Shoshone occupied southwestern Montana. According to ethnographic and historic information, the Blackfeet and the Shoshone ventured along the trail systems of the Blackfoot River. European settlers, for example, noted the presence of Blackfeet Indian camps near Lincoln Gulch (just west of the town of Lincoln, Montana) in the 1870s (Brumley 1998; Upper Blackfoot Valley Historical Society 1994).

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Indian groups that used the Buffalo Road traveled over bisected and mountainous terrain and along interconnected pathways that were known to families over multiple generations. Large numbers of people participated in this mountains-to-plains trek. The pattern and regularity of this travel was so familiar to western Indian groups that they established their own claims to Plains bison herds (Farr 2003:4). According to the Salish and Pend d’Oreille Culture Committee and the Elders Cultural Advisory Committee, in precontact times, these two groups occupied as much land east of the Continental Divide as they did to the west of it (Salish-Pend d’Oreille Culture Committee and Elders Cultural Advisory Council 2005:83). The Salish were organized into bands based in areas around what is now Montana’s Helena Valley (č̓elmšé), the Three Forks of the Missouri (čxʷ tx tpe) and the Big Hole Valley (skʷ umcné)—all within or near productive bison country. The traditional tribal place names for these areas indicate the longevity of their use and their importance (Salish-Pend d’Oreille Culture Committee and Elders Cultural Advisory Council 2005).

By the 1850s, groups of several thousand people and double the number of horses regularly traveled across the divide to hunt bison and secure robes for trade. Between 1800 and 1875, the number of treks across the divide increased significantly. Salish groups began spending more time on the Plains, often over-wintering there, and favoring bison hunting locations such as the Musselshell and Yellowstone Rivers (Turney-High 1937:117). Journeys along the Buffalo Road Trail were an essential part of life for the Salish and other Columbia Plateau groups with each journey marked by new experiences and information that were inextricably linked with the places en route (e.g., Zedeño et al. 2009:108). Landmark learning was as a cartographic tool for way-finding and was used
as a mnemonic device for stories and myths (Zedeño 2000:17). For the Blackfeet, naming features and landmarks was a crucial way to educate children about navigation and to enable them to find their way, especially young hunters (Zedeño et al. 2009:112).

The Buffalo Road Trail, as a linear feature, crosses a diverse array of geographic areas. Based on ethnographic information, trail travel on the Buffalo Road evolved from family groups crossing the Continental Divide to hunt buffalo and to trade to large groups banding together en masse for defensive purposes (Fahey 1974; McGinnis 1990; Turney-High 1937). The fact that the Nez Perce would not travel the Buffalo Road with Meriwether Lewis in 1806 for fear of enemy reprisal illustrates the hostile theater the trail had become by the historic period (Moulton 1993:96).

**Horses, Guns and Warfare**

By the time the Lewis and Clark expedition reached the area that is now Montana, ethnographic and historical documents indicate that Indian groups from the west, who enjoyed relative peace in their home territory, engaged in all out warfare with Plains Indian groups (Fahey 1974; Farr 2003; McGinnis 1990; Turney-High 1937). When Captain Meriwether Lewis and his party headed north across the Continental Divide in July 1806, Lewis was very anxious because he expected “to meet with the Minnetarees [Hidatsa] and are therefore much on our guard both day and night” (Moulton 1993:96).

Ross Cox, a North West Company fur trader wrote in 1818, “the Blackfeet lay claim to all that part of the country immediately at the foot of the mountains and allege that the Flat-heads [Salish] … are intruders who they are bound to oppose on all occasions” (Stewart and Stewart 1957:134-135 in Farr 2003:6). With a similar sentiment but an opposing view, the Salish and Nez Perce avowed that their forefathers claimed and
hunted on these lands and that even if only one warrior should remain alive, they would
fight for their right to hunt in these areas (Farr 2003:6).

The importance of the acquisition of the horse from 1730 to 1750 by Plains Indian
groups and the changes that ensued as a result cannot be overstated (Calloway 2003:267;
groups in the region adopted the horse, the territorial boundaries of these groups
fluctuated and were much contested (Binnema 2001; Fahey 1974; Farr 2003; Malouf
1980; Turney-High 1937). Horses, along with other forces of change, including European
goods, guns, and disease, radically changed tribal life. Tribes such as the Hidatsa, long-
time residents of the Middle Missouri River region, took up seasonal residence on the
Plains and became a force to reckon with in areas as far away as the Three Forks of the
Missouri and along the Buffalo Road Trail (McGinnis 1990:21–24; Moulton 1993:96).
Sacagawea, a Shoshone Indian, was captured by the Hidatsa (Minnetarees) and taken to
the Mandan/Hidatsa villages, where she later met Lewis and Clark in 1805. In the early
1700s, the Shoshones were one of the strongest tribes on the Plains because they were
one of the first tribes to acquire the horse (McGinnis 1990:2). However, the Blackfeet
who possessed muskets first and horses soon thereafter, drove the Shoshone, Salish, and

The ability to mobilize quickly and over long distances on horseback enhanced
opportunities for raiding and increased intertribal warfare. Explorer Alexander
MacKenzie observed that English traders often found themselves in the middle of raids
and counter-raids that were executed for revenge and to improve status (McGinnis 1990).
Francois Larocque, a fur trader with the North West Company observed such a raid in
1804 between the Crow and Assiniboine where he and his men watched the Crow mutilate deceased Assiniboine warriors after a Crow victory. Corpses were skinned, limbs cut off, and bodies repeatedly stabbed. The mutilation, Larocque reported, was the ultimate revenge because the Crow believed the enemies would arrive to the afterlife in grotesque form (McGinnis 1990:28). Despite the widespread system of warfare, however, periodic peace prevailed and alliances shifted (McGinnis 1990: 22). The ritual of smoking the calumet pipe often allowed bitter opponents brief respites in which to trade and interact socially in relative peace (Point 1967:158). Once out of each other’s sight, however, the rivalry commenced once again (Wood 1980:104).

For the Salish and Pend d’Oreille, Farr (2003:7) posits that by the nineteenth century, warfare and its status-winning outcome became primary goals related to bison hunting and the economic benefits became secondary. On the Plains, Farr suggests that western tribes who were normally peaceful at home, transformed themselves as they engaged in horse raids, ambushes, and warfare—behaviors and opportunities unavailable to them west of the Continental Divide. Early explorers observed the considerable losses western tribes endured in hostile Plains territory. According to historical documents of Bureau of Indian Affairs agents, groups who endured the journey and spent time on the Plains enjoyed a much higher status than those who stayed behind west of the Continental Divide (Farr 2003:5).

Certain accounts examined by Farr (2003:9) suggest that ventures to the Plains were unnecessary and that tribes had plenty of food in their home territories. However, these accounts need to be scrutinized as they were made by incoming Europeans and
therefore, are inherently biased and based partially on the discomfort early settlers, explorers, and missionaries felt as they watched physical assaults between warring tribes.

Trade and Exchange

The archaeological evidence of trail use by indigenous people reflects the extent of prehistoric-historic geographical linkages and the range and magnitude of the goods being transported (Blakeslee and Blasing 1988; Ewers 1968; Trombold 1991b; Wood 1980). The Buffalo Road originated at the confluence of the Blackfoot and Clark Fork Rivers and crossed the Rocky Mountains and then extended north out onto to the Plains to trails that followed the Missouri River to the north or to the south, to major trading centers along that river (Farr 2003; Hall et al. 2006; Moulton 1993; Scott 2001). The Buffalo Road Trail provided access to ancillary trail networks that led to the Musselshell, Yellowstone, and Judith Rivers; all considered favored hunting grounds for the Salish (Fahey 1974:169; Turney-High 1937:117). Francois-Antoine Larocque noted that in 1805 the “Flatheads” (actually Salish) traveled every fall to the Three Forks of the Missouri to hunt bison. Winter hunts provided the best bison robes, which served as a valuable trading commodity. According to Fahey (1974:168), Salish robe sales averaged approximately 26,000 between 1815 and 1830, but rose to an average of 70,000 between 1845 and 1853. The Missouri River, notably Fort Benton, served as a collection point for robe exchange and trade.

Although trail travel was linked to subsistence for many tribes, it also provided important opportunities to socialize, trade, and find mates (Farr 2003; Wood 1980). Aboriginal trading patterns on the northern Plains, often referred to as the Middle Missouri system, are well documented (Creel 1991; Ewers 1954, 1968; Manson 1998;
Major trading centers included The Dalles on the Columbia River, the Middle Missouri Mandan/Hidatsa Center in central North Dakota, and the Shoshone Rendezvous Center in the corner of southwest Wyoming (Ewers 1968:16; Wood 1980:101). Trade flowed from all directions from these centers with smaller trading points at confluences of major rivers, such as the Blackfoot and Clark Fork Rivers. For the Middle Missouri system, Ewers (1968) includes three successive time periods for trade and exchange including aboriginal, protohistoric, and historic. Through time, what was traded across these systems varied but the pathways by which they were connected likely remained the same (Wood 1980:103). The Shoshone Rendezvous Center linked major trading centers to the east and west and was as an intermediary post between them. Equally as important, the Shoshone center also linked people to a completely different culture area, namely the Great Basin, which allowed for the infusion and trade of distinct items, such as coiled baskets (Scott et al. 2014).

Based on ethnographic information, items from the Plateau were exchanged with items from the Plains. Plains trade items included bison robes, parfleches, skins and furs, eagle feathers, bone beads, and finely tanned and ornamented clothing (Ewers 1968:20-21; Haines 1955:43). Plateau trade items included dried salmon, fish oil, feathers, roots and seeds, hemp and twine, shells (Dentalium and Olivella), pemmican, mountain sheep horns, bowls, ladles and spoons, and woven baskets (Haines 1955:43; Wood 1980:102). To get a true picture of what was traded prehistorically, Ewers (1968:21) cautions that most Plains trade items were perishable goods which would not survive in archaeological contexts. However, some traded items that moved across the continent appear in the archaeological record and indicate the antiquity of trade networks accommodated by a
vast system of trails. Examples of this include a slate carving of Haida origin that appeared in a Crow medicine bundle (Wood 1980:103), Pacific Coast shells recovered in Ghost Cave (Scott and Urbaniak 2014), and the presence of Knife River flint from the Dakotas appearing in an 8,000-year-old site in Colorado (Wheat 1972:126). Toolstone, in fact, the most common indicator of archaeological sites in the area, was undoubtedly a traded commodity (MacDonald 2012:98; Rennie 2004:17). Two massive obsidian biface cores found just outside of the town of Lincoln, Montana by a Forest Service employee just north of the Buffalo Road Trail suggests that toolstone was transported along the trail and traded to others.

**AN ARCHAEOLOGY OF TRAILS AND LANDSCAPES**

Trail systems were critical to hunter-gatherer survival and subsistence in the American West as this study demonstrates, but comparatively little archaeological attention has been paid to them (Snead et al. 2009a:2). The lack of concerted archaeological inquiry may be due to the fact that trails are often poorly preserved and easily destroyed by changing land use, natural degradation, livestock grazing, and modern development. Furthermore, they do not easily fit in current archaeological research paradigms that focus more on specific sites rather than relationships between them on a broad scale (e.g., Anschuetz et al. 2001; Binford 1983). The relatively few trail studies that do exist tend to be compendiums of diversified investigations (Davis 1980a; Snead et al. 2009b; Trombold 1991a) or topical studies, such as Inuit trails in Alaska (Aporta 2009). The Buffalo Road study conducted by Farr (2003) is excellent, but draws primarily on historical accounts and includes little ethnographic or archaeological evidence.
The Buffalo Road Trail, which was created centuries if not millennia ago by native peoples as shown, is simply described by Meriwether Lewis as a well-worn Indian “road” (Moulton 1993:85). From a cultural landscape perspective, the trail provided the link between the environs of the Columbia Plateau and grass filled prairies of the Plains which supported large populations of bison. Prehistoric roads and trails are unique in that they are tangible evidence of the links between and among groups over large geographic areas. Trail arteries and networks linked prehistoric populations—in this case, American Indian bands—and are reflective of the groups who used them as well as the world in which they lived (Malouf 1980; Oetelaar and Meyer 2006; Snead et al. 2009a; Zedeño et al. 2009). Trails are best viewed as landscapes of movement with their scale, pattern, context, and association providing information on the structure and practice of the everyday lives of past peoples (Snead et al. 2009a:3).

The Buffalo Road Trail is probably best viewed within the theoretical orientation of landscape archaeology, which provides a frame of reference for understanding human-nature relationships at various levels (Anschuetz et al. 2001; Dalgish 2012; Golledge 2003; Kelly 2003; Kelso and Most 1990; Snead et al. 2009a; Trombold 1991b; Yamin and Metheny 1996; Zedeño 2000; Zedeño et al. 2009). A landscape approach examines the outcome of human interaction with the natural world and views it as collaboration between “human and non-human actors” with each contributing to specific outcomes (Dalgish 2012:332).

Landscapes and their “meaning” to people were dynamic constructions that changed over time and reflected peoples’ histories (Zedeño et al. 2009). Trail features (as landscapes) provide a type of cultural heritage that is amenable to understanding the
nuances of such changes over time (e.g., Lightfoot 1995). Landscapes afforded ways for people to signify themselves with each generation imposing its own cognitive map on the world (Anschuetz et al. 2001:16; Zedeño 2000). Basso (1996) has shown that traditional wisdom is tied to places and that landscapes are replete with history, legend, knowledge, and power. The landscape domain involves within-place and between-place patterning making the approach particularly suitable for trail studies, as peoples’ lives encompassed whole landscapes—not simple singular sites—and were the arena for a group’s economic, sociological, and ideological activities (Binford 1983:109). In this sense, features and sites along the trail become landscape or human agency “signatures” that reflect the choices of both prehistoric and historic trail travelers as they encountered obstacles and opportunities (peeling trees, selecting locations to camp and building stone forts, rock cairns, and stone crosses). These signatures, when viewed from a humanities and culture history perspective, allow us to examine trail use and its associated behaviors as a historical process and from a deep-time perspective (e.g., Sassaman and Holly 2011; Prentiss 2011).

In the hierarchy of human movement and travel, trails and paths are the most informal, in contrast to complex and well-constructed road networks that require periodic maintenance (Chevallier 1976; Hirth 1991; Hyslop 1984; Sever and Wagner 1991). Routes are determined by terrain, economics, and mode of transportation, organization of society; and function in regard to mobilization and group coordination (e.g., Fowler 2009). Although trails are the simplest form of travel, there are examples of elaborate organizational road networks elsewhere, such as those found in Chaco Canyon in the Southwest, but these systems also included trails and paths which diverged from main
arterial routes (Sever and Wagner 1991). Trails and routes were established not only for mobilization of groups but also for ceremonial reasons such as the sacred trail system used by the Chemehuevi and the Las Vegas Southern Paiute of southern Nevada and California (Fowler 2009:88).

On the northern Plains, trail selection by hunter-gatherers depended on group size, season of travel, the length of travel, the use of horses or dogs, and which mountain passes most easily facilitated the haul, especially when pack animals were laden with hundreds of pounds of meat, hides, toolstone, and other commodities (Ewers 1980; Farr 2003; Loendorf and Brownell 1980). In this sense, the landscape terrain and the circumstances of the trip dictated the travel “niche” best suited to the journey. Low elevation passes were consistently sought out as the best place to cross a mountain range (Davis 1980b; Loendorf and Brownell 1980). Along the Rocky Mountain Front in Montana, large archaeological sites (camps) are found at nearly all mountain passes, which attests to repeated crossings by hunter-gatherer groups (Knight 1989). Schaffer (1911), who spent two years traveling “old Indian trails” through the Canadian Rockies, mentions the innumerable passes crossed by the ancient trails. Specific to the study area, the people who used the Buffalo Road Trail traveled over either Lewis and Clark Pass or Cadotte Pass to the south depending on their final destination (Stone 1913:99). Lewis and Clark Pass lead to the Sun River and the Great Falls of the Missouri whereas Cadotte Pass led to the Three Forks of the Missouri and areas further east including the Musselshell and Yellowstone Rivers (Johnson 1969).

At a fundamental level, trails facilitated the efficiency of transportation and collapsed social space. Hassig (1991:18) suggests that although prehistoric roads and
trails served many functions, their primary purpose was economically based with the maintenance of social and religious ties being secondary. However, other researchers emphasize that trails also profoundly affected the social world of the Indian groups who used them as they brought distant groups together who could then exchange items and information, as well as socialize, and potentially intermarry (Blakeslee and Blasing 1988; Manson 1998; Wood 1980). Tilley (1994:31) suggests that trails “form an essential medium for the routing of social relations.” In the context of the British Neolithic, trails linked settlements and monuments and effected how people approached these places creating a narrative of experience (Snead et al. 2009a:14). In this sense, within the broad context of settlement and exchange lies information relative to practices of travel, migration, and the formation of alliances (Sassaman and Holly 2011:8).

**WHOSE TRAIL IS IT?**

Over the past millennium and into the early period of European contact, the Buffalo Road Trail was used by a variety of Indian groups as shown by archaeological, ethnographic, and historical data. The validity of oral history information juxtaposed to information derived through scientific methods is debated in the field of archaeology (Colwell-Chanthaphonh et al. 2010; Echo-Hawk 2000; Mason 2000; Watkins 2000; Whiteley 2002). Oral history, however, is a bridge between recent and past cultures and helps provide a more holistic approach that includes examining multiple lines of evidence to interpret a series of windows that span a continuum of prehistoric, protohistoric, and historic times (Lightfoot 1995:202). Some view the investigation of prehistoric sites as a platform for conducting “indigenous archaeology” or archaeology done with, for, and by indigenous people. This form of inquiry is becoming increasingly popular (Aporta 2009;
Schaepe 2006; Watkins 2000; Whiteley 2002; Zedeño et al. 2010), thus challenging traditional archaeology and what some feel is the discipline’s long-standing colonialist underpinnings (Colwell-Chanthaphonh et al. 2010:229; Moss 2005:583). It also challenges current archaeological theory which is, for the most part, commonly devoid of the views of indigenous people (Moss 2005; Watkins 2000). An interesting case in point is the current place name of the pass—Lewis and Clark Pass—named for Meriwether Lewis who visited the area for less than an hour and William Clark who never set foot there, yet it was a pass that was crossed by thousands of indigenous people for at least 1,000 years and who likely had a number of place names for it and associated areas. It is also possible that western tribes felt as the Inuit of Alaska do—as Aporta (2009) describes—that trail travel was part of who they were. Trail travel was so deeply embedded in their lives and the lives of their ancestors, that they continued to go to the Plains, part of their original home territory, in an almost predetermined way—it was a tradition they needed to continue at all costs. The Inuit consider and regard trails with words that translate to and approximate the concept of “home.” Inuit travelers do not view trails as isolated entities but as places infused with collective memory of previous trips, places filled with an array of essential, life sustaining information (Aporta 2009:132).

The portion of the Buffalo Road discussed in this study is located on federal Forest Service land. The documentation of the trail, its listing in the National Register of Historic Places in conjunction with the Lewis and Clark Bicentennial commemoration, brought considerable attention to the trail and the valuable resources along it, including the ancient and historic use of the trail by diverse cultural groups and the significance of
the longer-term use of the trail to the region’s indigenous people. The National Register listing spotlights the significance of the resource and the importance of its preservation. These cultural resource values also guide Forest Service land management decisions for the Alice Creek drainage and Lewis and Clark Pass. When fire threatened the area in 2001, Forest Service resource specialists determined that constructing bulldozer lines to avert the fire would cause more damage to the trail's integrity and site features than the fire itself. Thus, the fire was left to take its natural course. Thankfully, the fire burned in the opposite direction and archaeological and historical resources were spared.

**SUMMARY AND CONCLUSIONS**

The Lewis and Clark Bicentennial provided an impetus for federal agencies to identify Lewis and Clark trail segments on public lands and to document associated prehistoric and historic resources. Through consultations with American Indians, agencies gathered tribal perspectives about the trails Lewis and Clark followed. Rather than focusing solely on the expedition's history, agencies took a more holistic approach, using oral histories, ethnographies, historical accounts and landscape archaeology to document the trail's overlapping uses and the lifeways of the people who once traveled along it. A landscape-based approach allows us to envision the Buffalo Road Trail as a feature imbued with stories and myths linked to and captured by place names (e.g., “Smitu Sy"cu2asi” or “Indian Fort Pass”) for a wide variety of geographical landmarks. Place names served as mnemonic devices linked to stories and myths that were (and still are) critical to group identity and social cohesion (Anschuetz et al. 2001; Zedeño 2000; Zedeño et al. 2009).
Through the use of the direct historical approach, a continuum of travel was revealed for the trail beginning with treks by unknown prehistoric groups and then later by Salish, Pend d’Oreille, and Nez Perce groups, who used the trail to access buffalo hunting grounds on the Northwestern Plains. Buffalo provided not only subsistence but robes, skins, and dried meat for exchange and barter. The trail itself became a home of sorts for many tribes and was deeply embedded in subsistence economies. It also played a critical role in providing access to and maintaining an array of trading relationships and social networks which were highly dynamic and continually evolving.

After the horse was introduced between 1730 to 1750, (and probably at least a hundred years or more before), the trail was traversed by raiding parties of Blackfeet, Crow, and others who crossed the divide to raid the camps of western Indian groups. During this time, Salish-Pend d’Oreille groups built stone forts (Smitsu Sxʷcuʔsi) on top of the divide to hide behind and watch for enemy parties (Salish-Pend d’Oreille Cultural Committee 2003; Salish-Pend d’Oreille Culture Committee and Elders Cultural Advisory Council 2005:54). Use of the trail and the constant journeys back and forth across the divide portrayed in ethnographies and historical documents breathe life into the pre-contact nomadic world which is most often depicted merely from the perspective of stone tool use.

The presence of Pacific Coast shells in Middle Missouri sites and at sites like Pictograph Cave in south-central Montana, as well as the presence of Knife River flint from the Dakotas in Paleoindian sites in Colorado prove the existence and antiquity of prehistoric trade. Major trading centers existed at The Dalles along the Columbia River, in the Dakotas at the Mandan/Hidatsa Center, and at the Shoshone Rendezvous point in
southwestern Wyoming. In order for items to be traded, specific routes were taken that connected these places. Trails provided the link for the transfer of goods across large expanses of space. Ethnographic studies coupled with archaeological data, document the importance of trails as pipelines for the diffusion of a vast array of items and undoubtedly, information exchange, mating, and social interaction.

The investigation of the Buffalo Road Trail included the identification of intact trail tread and the documentation and study of numerous prehistoric and historic sites found along the trail. Sites included prehistoric lithic scatters, stone forts, rock cairns, and a stone cross feature. Prehistoric sites reflected the long use of the trail and the tradition of buffalo hunting on the Plains whereas the stone forts indicate warfare and conflict over resources and territory. The many rock cairns mark the trail’s location and possibly made the trail smoother and easier to travel or perhaps offered travelers a respite to stop and pray or a means to make an offering for a safe journey. The stone cross at Lewis and Clark Pass reflects the arrival of missionaries or “black robes” and their attempt to convert Indian groups to Christianity. It also suggests that missionaries left religious icons to mark their passing as a means to ensure spiritual protection and safe passage for their journey and as a way to spread the word, through a symbolic icon, of their religion.

The sites along the trail not only mark its location but reflect its continued use from prehistoric to historic times. The cultural landscape of the trail and its sites and features comprise an entire window of human use and changing social dynamics. Although the Buffalo Road Trail was long used by indigenous Indian groups, its fame and notoriety come from its association with Captains Meriwether Lewis and William Clark, though the expedition spent less than four days traveling its 74.5 mile (120 km)
length and William Clark never saw it. Ethnographic information, oral histories and historical documents expose the layers of trail use over time. Although tribal people often view the Lewis and Clark expedition as a reconnaissance for the invasion of their land, were it not for Lewis and Clark who meticulously studied the trail they followed and used sextants and compasses to carefully document the path, the documentation and subsequent protection of sites along it would have been much more difficult. Although some view the commemoration of the Lewis and Clark expedition as a reflection of lingering colonialism, the study undertaken here portrays Lewis and Clark as a piece in an enormous puzzle of tribal travel, trade, warfare, and social interaction overlain by the spread of European religions and the exploration and development of the American West.

ACKNOWLEDGEMENTS

The USDA Forest Service/Helena National Forest and the Northern Region are gratefully acknowledged for the use of information on the Buffalo Road and for allowing the author to conduct research on the trail. Former Forest Service employees, Margaret Gorski and Amy Teegarden, are thanked for their support in the documentation and interpretation of the Buffalo Road. Anthony Incoshola of the Salish and Pend d’Oreille Culture Committee and Thompson Smith provided oral history information for Lewis and Clark Pass. Chaney Bell supplied Salish language translations for various locations. Tim Ryan and Dave Schwab of EthnoTech, Inc. shared map information of traditionally used Salish Indian trails. Carl Davis reviewed drafts of the manuscript and offered helpful comments and overall guidance. Eric Carlson produced the graphic illustrations. The author appreciates critical review comments on this article by Drs. Kelly Dixon, Charles Orser, and Maria Zedeño.
The author is especially thankful for the feedback and guidance of her doctoral dissertation committee at the University of Montana, Department of Anthropology, including Drs. Rafael Chacon, Kelly Dixon, Douglas MacDonald, Anna Prentiss and Richard Sattler.
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CHAPTER 4

DECIPHERING WPA ARCHAEOLOGY ON THE NORTHWESTERN PLAINS: ANOTHER LOOK AT THE HISTORY AND CULTURAL CHRONOLOGY OF PICTOGRAPH CAVE

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Abstract

Pictograph Cave (24YL0001) located in south-central Montana was excavated by Works Progress Administration (WPA) crews between 1937 and 1941. Excavations extended to depths of 23 feet, yet no radiocarbon dates for the site were available until recently. Montana State Parks sponsored efforts to re-catalog and process the artifact collection to professional standards along with the creation of three-dimensional models of the excavations rendered from WPA stratigraphy maps. Newly created databases allowed for artifacts from the cave’s lower levels to be easily identified and subsequently submitted for radiocarbon analyses providing chronometric dates for the sequence of human occupation in the cave. This paper discusses the results of radiocarbon dating analyses which indicate the earliest occupation of Pictograph Cave dates to the late Middle Archaic period, conflicting with the much earlier chronological sequence developed by William Mulloy in 1958. The cave’s location on the landscape and its proximity to major travel routes along the Yellowstone River are also examined.

Key words: Pictograph Cave, chronology, radiocarbon dating, Works Progress Administration (WPA), three-dimensional modeling

Pictograph Cave (24YL0001), located eight miles (12.8 km) southeast of Billings, Montana, is one of very few large cave sites located in the pine parklands region of south-central Montana (Figure 4.1). It and its neighbor, Ghost Cave (24YL0002) located just 600 feet (183 m) away, were excavated between 1937 and 1941 by Works Progress Administration (WPA) crews under the direction of Melville Sayre and Oscar Lewis. A third cave located between the two main caves appeared to be culturally sterile.

Beginning in 1940, William Mulloy became the field director of the excavations and
worked to define the cave stratigraphy based on his predecessor’s field records and his own limited time at the site, prior to the era of radiocarbon dating. Based on the content of the two caves, Mulloy developed the first cultural chronology for the Northwestern Plains, which was later refined by Reeves (1983), Frison (1991), and Kornfeld et al. (2010).

The following study describes: 1) the history of Pictograph Cave and the original cave excavations; 2) radiocarbon dating of artifacts from various levels and areas of the cave; 3) the context and time frame of other rockshelter and cave occupations in the surrounding area and how Pictograph Cave fits in comparison; and 4) the landscape
context of Pictograph Cave and its influence on the selection and use of the cave over
time. The primary purpose of the investigation is to reassess the age and cultural
chronology of Pictograph Cave as originally defined by Mulloy (1958). Mulloy’s
chronology included four cultural units (levels I-IV), which encompassed Paleoindian
through Late Prehistoric occupations (e.g., Frison 1991; Kornfeld et al. 2010; MacDonald
2012; Reeves 1983). It has long been assumed that Pictograph Cave was thus comparable
to a handful of other, relatively rare cave and rockshelter sites on the Northwestern Plains
with deep cultural deposits and lengthy occupational sequences, including Mummy Cave,
Medicine Lodge Creek, and select sites in the Bighorn Basin of Wyoming (Finley et al.
Wedel et al. 1968). However, given the quality of the original WPA excavations, and the
absence of radiocarbon or other chronometric dating techniques, this assumption had
never been tested.

Sites such as Pictograph Cave, with deep cultural deposits and a massive artifact
collection, are extremely rare on the Northwestern Plains. Many, if not most, stratified
sites in this region were either previously excavated or disturbed by vandals. As a result,
deciphering WPA archaeological excavations and their affiliated artifact collections was
deemed essential to better understand prehistoric hunter-gatherers in this area of south-
central Montana. Chronometric dates for cultural deposits within Pictograph Cave allow
for chronological comparison with other regional caves and rockshelters (e.g., Bliss 1950;
chronological control also allows for closer examination of changes in site use over time and of travel, trade and exchange patterns as reflected in the cave deposits.

Because artifacts from the level defined by Mulloy (1958) as Pictograph Cave III were recently radiocarbon dated (Scott et al. 2014) and level IV is the historic, surface level of the cave, the focus of the current research was on obtaining radiocarbon dates from what Mulloy (1958) classified as Pictograph Cave I and II so that each level of the cave could be firmly established in time.

SITE DESCRIPTION AND SETTING

The setting, geology, and archaeology of Pictograph Cave are described in detail elsewhere (Aaberg and Crofutt 2008, 2009; Axline 1997; Connor 1967; Deaver 1986; Loubser 2011; Mulloy 1958; Schwab 1987; Schwab et al. 1996; Scott et al. 2014; Vanaman 1991) and therefore, are only briefly summarized here. The cave is located in south-central Montana in Yellowstone County, approximately two and one half miles (4 km) southeast of the Yellowstone River, a major prehistoric travel corridor on the Northwestern Plains (Wood 1980; Zedeño et al. 2009). The site sits on the northeast side of Bitter Creek, a seasonal tributary of the Yellowstone River. The Bitter Creek and the Yellowstone River valleys are characterized by broken terrain that includes high Pliocene benches and Pleistocene benches and tablelands (Aaberg and Crofutt 2009:11). Most drainages in the area are rimmed by sandstone cliffs belonging to the Eagle formation. These spectacular cliffs, including the sandstone rincon where Pictograph Cave is located, are one of the area’s most striking geologic features (Figure 4.2).

Pictograph Cave is formed within the weakly consolidated Eagle Sandstone formation. Thus, the cave is highly vulnerable to erosion by wind, water, temperature
fluctuations, and wetting-drying cycles (Loubser 2011:3; Smyers 2012:80-88). Block fracturing and spalling of the Eagle sandstone is common, as attested by the large and abundant boulders found below the cliff formation, as well as inside the shelters. Mulloy (1958:27) specifically noted that within the cave which is 160 feet (48.7 m) wide and 45 feet (13.7 m) deep, excavations were made difficult by the abundance of sandstone blocks. These natural processes, combined with the effects of rodent burrowing and recent human activity, have all disturbed cultural deposits inside the caves. In fact, the conditions encountered in Ghost and Pictograph Caves presented significant excavation challenges. Field supervisor, Oscar Lewis daily described in his excavation notes the number of men (sometimes up to 10) that were exclusively dedicated to the task of breaking up large sandstone blocks. Sandstone rockshelters by their nature are fragile
structurally and rock fall is common (Rapp and Hill 2006:83; Smyers 2012:55). Large and highly visible cracks on the roof of Pictograph Cave illustrate this structural vulnerability and reflect the eventuality that the cave will collapse at some point in time.

**HISTORICAL BACKGROUND**

The history of the Pictograph Cave excavations is well documented in numerous publications, as noted above. The three highly-visible caves were well known to area residents (including Crow tribal members) in the late 1800s (McCleary 2008). Originally located on private property, the caves contained over 100 prehistoric painted images and attracted picnickers, amateur archaeologists, and hobby and professional collectors. Willem Wildschut with the Museum of the American Indian in New York City conducted excavations in Pictograph Cave in 1920, but there are no records of what materials he recovered or where they might now be located. By the early 1920s, the upper levels of both caves were extensively vandalized (Schwab 1987:30).

Unchecked amateur exploration, artifact collecting, and recreational use ceased with the arrival of Henry Melville Sayre from the Montana School of Mines in Butte. In 1937, Sayre commenced excavations in Empty Gulch. Oscar Lewis was appointed field supervisor and played a crucial role overseeing excavations and data recordation. In 1939, Sayre was removed from the project, leaving Oscar Lewis to supervise the excavations. In October of 1940, William Mulloy with the Montana Statewide Archaeological Survey took over the project. By then, all of the cultural deposits in Ghost Cave and most of the deposit in Pictograph Cave were removed. The excavations ended in August of 1941, with William Mulloy overseeing the project for less than a year.
Excavations at Pictograph and Ghost Caves attracted numerous visitors with an estimated 10,000 people visiting the site in 1938. Artifacts were given away by the field crew to visitors. In an effort to develop local tourism, a small museum was built in Empty Gulch by the City of Billings. The museum was subsequently vandalized and later destroyed by an arson-caused fire, which also consumed the archaeological materials inside. The field notes of Oscar Lewis indicate that over 200 projectile points alone were displayed in cases inside the building but no record or list of the specific artifacts included in the cases was ever found.

No further excavation has occurred in Ghost or Pictograph Caves since the WPA investigations. Small-scale testing in and around the caves has been conducted over the past several decades to facilitate Montana State Park construction projects (Aaberg and Crofutt 2008, 2009; Crofutt and Aaberg 2008; Deaver 1986, Deaver and Vander Steen 1993; Feyhl 1966). A single date of $1470 \pm 160^{14}C$ yr B.P. (Beta-17312; bone) was obtained during one investigation from unidentified faunal remains recovered inside Pictograph Cave (Deaver 1986:25). Site testing in Empty Gulch below the caves for a proposed trail project resulted in the discovery of a cooking hearth containing bison bone. A date of $850 \pm 40^{14}C$ yr B.P. (Beta-243945; bone collagen) was obtained from the hearth feature (Figure 4.3, also see Aaberg and Crofutt 2008:32).

In light of the deteriorating condition of the Pictograph Cave rock art, feature recordation, radiocarbon dating, and condition assessments have been conducted through Montana State Parks sponsorship (Dean 1997; Loendorf and Dean 1993; Loubser 2011). A date of $2,145^{14}C$ yr B.P. (average of three samples) was derived from a turtle figure painted with charcoal based pigment on the wall of Pictograph Cave (Rowe 1995).
On January 20, 2013, the complete turtle figure spalled from the cave wall during a period of intense freeze-thaw fortunately landing intact (Billings Gazette, January 26, 2013), thus demonstrating the instability of Eagle sandstone.

The artifact collection from Pictograph Cave State Park has its own unique history. The collection was initially sorted at the Billings Commercial Club, and then sent to the Montana School of Mines in Butte for processing and cataloguing. A second field laboratory was subsequently set-up by Sayre in Lewistown, Montana, and material from Pictograph Cave was sent there. Thus, in 1938, a small museum in Lewistown came to
hold one of the finest prehistoric artifact assemblages in Montana (Schwab 1987:51).
Disagreement over the collection’s disposition led to its return to the Montana State Normal School in Billings. Many of the purported 30,000 artifacts did not return from Lewistown, based on comparison between the original field notes, Mulloy’s publication (1958), and the extant collection (Schwab 1987:48-58). Specimens were also either lost or removed while the collection was housed at the State Normal school in Billings (Axline 1997; Schwab et al. 1996). Oscar Lewis also came to possess some of the finest Ghost and Pictograph Caves specimens, many of which are now housed (but remain largely uncatalogued) at the Museum of the Rockies in Bozeman. Artifacts also disappeared including, possibly, some of the best specimens, when the museum in Empty Gulch burned down some time in the early 1940s (Schwab 1987:54).

In the 1970s, the collections from Pictograph and Ghost Caves were transferred to the Anthropology Department at the University of Montana-Missoula. The original hand written field notes of Oscar Lewis for 1940 and 1941 were also included along with various profile maps drawn by draftsman, Walter Vanaman. Lewis’ original notes from 1937-1939 are located at the Museum of the Rockies (Schwab et al. 1996). With the exception of University of Montana graduate students in Anthropology (e.g., Baker 1989; Hardes 2006; Schwab 1987), the collection from Pictograph Cave was closed to outside researchers for decades. The remains of more than nine individuals were found in the two caves and on the terrace in Empty Gulch during the WPA excavations (Snodgrasse 1958). The whereabouts of these remains has been in question for years. Portions of the remains were recently identified in collections at the University of Montana, the Museum of the Rockies and the University of Wyoming. Through the Native American Graves and
Repatriation Act (NAGPRA) process, Montana State Parks is working to return these remains to their rightful owners for repatriation (e.g., Thompson 2012).

While the importance of Pictograph Cave is broadly recognized, because it was excavated by WPA crews over 70 years ago, there are a variety of problems with artifact provenience, the organization and whereabouts of artifact collections, site stratigraphy, the interpretation of the excavation grid, and the precision of WPA data collection. Several University of Montana students have studied the stratigraphy of the cave in an attempt to decipher site excavations, but abandoned efforts because the information was simply too confusing and difficult to interpret (e.g., Schwab 1987). In 2008, Montana State Parks, who administers the site and the collection, initiated the reorganization, cataloguing, and storage of the collection and accompanying original field notes, as is further described in the Methods section.

SITE STRATIGRAPHY AND CULTURAL CHRONOLOGY

Based on WPA records, the field notes of Oscar Lewis (1941), and his own field observations, Mulloy (1958) divided the stratigraphy of Pictograph Cave into four separate levels based on artifact vertical positioning, artifact typology, and natural stratigraphy. The cave was excavated to about 23 feet (7 m) below ground surface. Pictograph Cave I, the oldest and lowest cultural unit was characterized by late Paleoindian occupations based on the recovery of a “Yuma” projectile point and other similar lanceolate points while Pictograph Cave IV comprised the upper, most recent historic level of the cave (Figure 4.4). Pictograph Cave III produced the most abundant archaeological materials dating to the Middle to Late Archaic and Late Prehistoric periods. With the exception of Pictograph Cave II, all levels yielded abundant stone and
bone tools and refuse, as well as, less commonly, wood, bone, shell, and hide artifacts. Bison were the subsistence focus in Pictograph Cave I, but species diversity increases (rabbit, deer, and antelope) in the successive levels and over time. Ghost Cave, although not the focus of the current study but very worthy of mention, was completely emptied of its deposit to a depth of 40 feet (12 m) by the WPA excavation crews. However, only the upper eight feet (2.4 m) of the cave deposit was culture-bearing (Schwab 1987:40). In artifact content, the deposits in Ghost Cave closely resemble what was found in the Pictograph Cave III level.

The WPA excavations were accomplished by horizontal stripping of excavation units in 10 foot (3 m) blocks. The standard excavation grid was laid out on an X (oriented east-west) axis and a Y axis (oriented north-south). Vertical elevations were recorded as
the Z axis. According to the field notes of Oscar Lewis, a very large portion of the cave, including the “apron” or exposed area in front of the cave was leveled horizontally to an unreported depth. The vertical depth of many of the units was not explained or documented. The profile maps are the only indication of excavation extent and depth. Based on Oscar Lewis’ field notes and artifact proveniences, the area shown as excavated in Mulloy (1958:25) is apparently much larger than what is depicted. The WPA excavations were carried out over a four year period with the excavations continuing over the winter months despite extremely cold temperatures which dipped to -7 degrees Fahrenheit on February 1, 1939 (Lewis 1941:299). Thus, severe cold and adverse working conditions likely contributed to various provenience and recording errors by WPA workers.

Before describing the stratigraphy as defined by Mulloy (1958:27-31), it is essential to explain how vertical depth was established during the WPA excavations. The datum set up for the project was located below the original surface of the cave so that in many areas, level, or ground zero, was over 20 feet below the surface of the cave (see Figure 4.4). Artifacts were measured up from elevation 0 in the stratigraphic column so that artifacts with single digit elevations were actually some of the lowest buried artifacts. Artifacts with an elevation of 2 are actually just two feet above the 0 line, which in most instances was about 21 feet (7 m) below the original surface of the cave. This method of excavation, referred to as “cut and fill” by engineers, was typical of highway construction projects in the 1930s. The vertical depth of artifacts confused researchers for years until one of the authors (Urbaniak) determined the process by which the excavations were carried out.
The stratigraphy and sediments in the four levels documented by Mulloy (1958:27-31) are detailed in Figures 4.4 and 4.5. Level I was identified at 23 feet (7 m) below the surface of the cave. Nowhere was the bottom of the cave reached (due, in part, to reaching the water table), so cultural deposits may still exist within or below level I. However, a deeper excavation unit was dug below level I and revealed seven sedimentary varves that were culturally sterile. The lowest level containing cultural deposits (S35/40E) was described as an irregular ash and charcoal lens that had “every appearance of an ordinary man-made hearth” (Mulloy 1958:28). No other cultural material was associated with this charcoal lens. Throughout the level I layer, which ranged in depth from 23 to 17 feet (7 to 5.1 m) below the cave surface, a variety of what Mulloy (1958:29) terms “unelaborated” hearths were identified. In four years of field notes written by Oscar Lewis, only one hearth is described as “rocked up,” all others are merely large concentrations of charcoal deposits (Lewis 1941:378). Apparently, the cave inhabitants simply built fires on the cave floor and did not surround or encase them with rocks. Above these lower hearths, Mulloy identified “many” additional hearths, some of which were quite extensive. Within level I, charcoal, faunal remains, a few bones tools, and chipped stone flakes were recovered. Unfortunately, the charcoal was not saved for future study or has been lost.

The succeeding level, Pictograph Cave II was described as a water-laid, brown stratum located approximately 12 to 17 feet (3.6 to 5.1 m) below the cave surface. Mulloy indicated that a sterile layer was present between level I and II but that this layer varied horizontally across the site. He also observed that although the artifact assemblages were somewhat similar, overall they were typologically distinct (Mulloy 1958:29).
Beginning at depths of approximately 12 feet (3.6 m) below the cave surface and extending to just a foot (30 cm) or less below it, level III was found to be completely “culture bearing.” Although sterile deposits separated levels II and III, no mention is made of the vertical extent of the sterile deposits. Hearths, faunal material, an abundance of chipped stone, and perishable artifacts were recovered. Level III was apparently much drier (see later climate discussion), allowing for preservation of the numerous perishable artifacts made of wood, leather, and other organic material (Mulloy 1958:30). Near the surface of the cave, Mulloy noted pottery and side- and basally-notched points which he classified as belonging to level IV. The pottery is described as Intermountain ware and believed to be associated with Shoshonean groups (Mulloy 1958:196-200). The oldest dates for this pottery tradition, at approximately 750 years B.P, are from the Myers-Hindman site in southwestern Montana (Kornfeld et al. 2010:62).

Mulloy (1958) provided limited information regarding cave sediments, relying mostly on field notes from WPA workers and their supervisors. He mentioned that the
cave deposits sloped toward the back of the cave, making stratigraphic reconstructions especially difficult. Based on its large size, Mulloy (1958:27) suggests that early erosion in the cave took place at a time when the bottom of the rincon was low enough that the surrounding talus slope did not reach the level from which the cave was eroded. Had it done so, the talus material would have filled the cave and inhibited further erosion and the creation of the very large recess. Mulloy also suggested that substantial water-laid deposits in the cave separated some of the stratigraphic layers. As suggested by cave morphology, during several time periods there was a substantial lip on the cave that allowed for the formation of pools of water inside. How water entered the cave specifically, either from the top of the rincon above the cave or through cracks in the wall, was not clearly indicated. However, since the excavations took place year round, Oscar Lewis described many instances in late winter of water flowing over the top of the rincon at the cave’s drip line into the excavation units, often times damaging and collapsing established profile walls and destroying hearths (Lewis 1941:325, 336a, 382). Thus, cycles of water flow and migration were evident even during the relatively short time that the cave was excavated. Lewis further detailed the exposure of large concentrations of packrat middens that were formed between the rocks or “voids” of the cave floor. Evidently packrats were moving cultural material from one area of the site to another, creating nests between large sandstone boulders (Lewis 1941:7, 40, 72, 84).

Clearly, Pictograph Cave contained complex natural and cultural stratigraphy, with its sediments created and affected by wind and water erosion, bioturbation, packrats, and modern human activity. These factors, coupled with WPA field records, make site stratigraphic and provenience reconstructions challenging. However, recently developed
three-dimensional (3-D) stratigraphic models developed by one of the authors (Urbaniak) using WPA profile maps as discussed below, enabled the placement of many (though not all) artifacts in vertical and horizontal provenience within the WPA grid system.

**METHODS**

In 2008, the Montana State Parks (MSP) heritage resources program launched an effort to catalogue the Pictograph and Ghost Cave collections housed at University of Montana-Missoula. The assessment involved entering all artifacts into a PastPerfect museum software database under one of the author’s (Scott) guidance, including individual descriptions of artifact type, material, dimensions, provenience, and condition, along with digital photographs. This MSP- and university-funded curatorial work directly enabled this chronological study of the artifacts and stratigraphy at Pictograph Cave.

Over the past two years, one of the authors (Urbaniak) digitized the original WPA plan and profile drawings and developed a 3-D model of the excavations so that a reliable cross-check of artifact provenience could be made. The drawings were first scanned at high resolution at Montana State University-Billings. The scans were then imported into AutoCAD Civil 3D 2014, enabling grids to be laid out in 10-foot (3 m) increments per the original survey grid (Figure 4.6). The intersections of the 3-D grids were then located on the XYZ coordinates, which corresponds to 0, 0, 0, and is linked to the original project datum. At each grid location, the appropriate excavation profile image was imported into 3-D space, scaled, and spatially-oriented. The profile boundary was then drawn for each location. Three plan views were imported into the construct, one showing the floor contour prior to excavation, one showing the contour after the excavations, and one showing boulders and fire hearths. The “before and after” contour maps were then
Figure 4.6. Profile maps and three-dimensional (3-D) model of the Pictograph Cave stratigraphy (note: top image shows the scanned excavation profiles and the bottom image shows the scans converted to a 3-D image, numbers at top and on left refer to excavation grid unit numbers).
digitized and 3-D terrains were generated from the data. The combined 3-D excavation profiles and post-excavation floor surface provided sufficient reference for importing and positioning the 3-D point cloud. This combined construct allowed for the positional reference of excavated artifacts, which are referenced by east-west (X axis), north-south (Y axis), and vertical distances (Z axis).

With the creation of a 3-D model, the determination of actual provenience and potential occupational sequences of Pictograph Cave became plausible. The availability of a searchable PastPerfect database and the 3-D excavation model allowed for a more accurate process to select artifacts for radiocarbon analyses in the University of Montana collection facility. As mentioned previously, because artifacts within Pictograph Cave III were recently radiocarbon dated (Scott et al. 2014), the sampling focus was on cultural materials from Pictograph Cave I and II.

Items selected for dating included three culturally modified bone tools found between 21 to 17 feet (7 to 5.1 m) below the cave surface (level I) and three bone artifacts from 12 to 17 feet (5.1 to 3.6 m) below the cave surface (level II). Since Level I represents 6 feet (1.8 m) of deposit and level II represents 5 feet (3.5 m) of deposits, artifacts from varying depths within each level were selected for dating to test whether lower artifacts are older (as assumed) or whether the deposits are actually mixed and that dates vary within the levels without specific regard to depth. Two modified bone artifacts were also selected from upper levels of Pictograph Cave III to cross check WPA provenience accuracy and possible deposit mixing. Artifacts selected were formed bone tools (pressure flakers or punches) or bone that had been slightly modified by smoothing.
Modified artifacts were analyzed to avoid any possibility that their occurrence was natural versus being brought to the cave by human action.

Mulloy’s (1958:26) stratigraphic description clearly identified hearth areas and associated artifacts with possible in situ provenience. Where possible, artifacts associated with hearths, either directly above or below were selected for radiocarbon analyses (see Figure 4.4, unit E40/N10 and unit E50/S20) since these areas were considered to have in situ provenience. Numerous references by Oscar Lewis (1941) indicated that packrats, water, weather, and unskilled and often unsupervised WPA workers all affected the preciseness of the excavations and artifact provenience. In addition, Lewis’ notes also speak to the artifact cataloguing system at the Normal School, stating that the “labels were all wrong” and that there was “no system” in place as the collection was processed in early 1939 (Lewis 1941:314a). Given this situation, an attempt was made to select artifacts for dating that were associated with in situ excavated fire hearths, as shown on stratigraphic maps, in the optimistic hope that they represented intact cultural deposits.

Artifacts chosen for dating were also selected from units where shell items were found at lower levels beneath them thus, providing a time frame for the earliest evidence of shell bead use and possible trade in the Yellowstone River Valley and at Pictograph Cave. Once selected according to the methods above, all samples were packaged according to procedures established by the dating facility and were submitted to Beta-Analytic, of Miami, Florida. Whole artifacts were sent and the laboratory determined the sample size needed for analysis and returned the remaining portion of the artifact. Because all artifacts were varnished in the lab in the 1940s, only bone collagen from uncontaminated surfaces was used for analyses.
RESULTS AND INTERPRETATION OF RADIOCARBON ANALYSES

The results of the radiocarbon analyses for Pictograph Cave are presented in Table 4.1. A total of ten samples were submitted. One bone sample, recovered from 20 feet (6.1 m) below the surface was examined by the lab and determined to be too contaminated to be analyzed. Another specimen was too small to obtain sufficient bone collagen. Four additional dates were also available from previous studies on perishable artifacts from the two caves (Scott et al. 2014) and three were available from previous research and compliance projects (Aaberg et al. 2008; Deaver 1986; Rowe 1995).

At present, the radiocarbon dates from Pictograph Cave all predominately fit within the Northwestern Plains Middle Archaic to Late Prehistoric periods (Frison 1991; Kornfeld et al. 2010; MacDonald 2012). Four of the dates fall within the Middle Archaic period (5000 to 3000 years B.P.), one date coincides with the Late Archaic period (3000 to 1500 years B.P.), and the remainder fall within the Late Prehistoric (1500 to 200 years B.P.) and Historic periods. Samples submitted from the lowest and presumably earliest levels of the cave, from depths between 21 and 18 feet (6.4 to 5.4 m) below the surface, ranged in age from $3820 \pm 30^{14}C$ yr B.P. to $3430 \pm 30^{14}C$ yr B.P. (Table 4.1, Figures 4.7 and 4.8). These dates are far later in time than what Mulloy (1958) proposed for Pictograph Cave level I, which contained a single “Yuma” Paleoindian projectile point from 21 feet (6.4 m) below the cave surface. This projectile point is no longer present in the Pictograph Cave collection at the University of Montana. One radiocarbon sample from approximately 21 feet (6.4 m) below the surface yielded a date of $1020 \pm 30^{14}C$ yr B.P. (Figure 4.8). This radiocarbon date demonstrates the cultural deposits at Pictograph Cave were mixed. Oscar Lewis’ field notes are extremely telling in regard to deposit
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Sample Type</th>
<th>Provenience (Mulloy 1958; Lewis 1941)</th>
<th>13C/14C Ratio</th>
<th>Conventional 14C Age BP</th>
<th>Two Sigma Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-366758</td>
<td>Bone Collagen</td>
<td>40S/70E, 19</td>
<td>-19.1%</td>
<td>250 ± 30</td>
<td>420 – 400 BP 320 – 280 BP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>170 – 150 BP</td>
</tr>
<tr>
<td>Beta-366757</td>
<td>Bone Collagen</td>
<td>20S/80E, 13</td>
<td>17.4%</td>
<td>160 ± 30</td>
<td>230 – 120 BP 40 – modern times</td>
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<tr>
<td>Beta-351106</td>
<td>Bone Collagen</td>
<td>20N/40E, 6.4</td>
<td>-16.3%</td>
<td>2420 ± 30</td>
<td>2690 – 2640 BP 2610 – 2600 BP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2500 – 2350 BP</td>
</tr>
<tr>
<td>Beta-363056</td>
<td>Bone Collagen</td>
<td>30S/40E, 5.1</td>
<td>18.6%</td>
<td>3430 ± 30</td>
<td>3700 – 3680 BP 3670 – 3640 BP</td>
</tr>
<tr>
<td>Beta-355785</td>
<td>Bone Collagen</td>
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<td>3980 – 3840 BP</td>
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<td>Beta-355784</td>
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<td>3610 ± 30</td>
<td>3980 – 3840 BP</td>
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<tr>
<td>Beta-366756</td>
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<tr>
<td>Beta-355786</td>
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<td>3820 ± 30</td>
<td>4350 – 4330 BP 4300 – 4150 BP</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4120 – 4100 BP</td>
</tr>
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</table>

**Previous Studies**

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Sample Type</th>
<th>Provenience</th>
<th>13C/14C Ratio</th>
<th>Conventional 14C Age BP</th>
<th>Two Sigma Calibration</th>
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<tr>
<td>Beta-316356</td>
<td>Wood, paint applicator</td>
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<td>-21.6%</td>
<td>310 ± 30</td>
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<tr>
<td>Beta-316357</td>
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<td>39S/82E, 24</td>
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<td>520 ± 30</td>
<td>620 – 610 BP 550 – 510 BP</td>
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<td>unknown</td>
<td>957 ± 27</td>
<td>928 – 905 BP</td>
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<tr>
<td>OxA-21512</td>
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<td>1371 ± 31</td>
<td>1344 to 1436 BP</td>
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<tr>
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<td>From Rowe 1995</td>
<td>unknown</td>
<td>2145</td>
<td>Not available</td>
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<td>Beta-243945</td>
<td>Bone Collagen</td>
<td>From Aaberg et al. 2008</td>
<td>unknown</td>
<td>850 ± 40</td>
<td>900 – 790 BP</td>
</tr>
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</table>

Table 4.1. Radiocarbon dates from Pictograph Cave (24YL0001) Cave (note: information from current study is at top of table, dates from previous studies are shown at bottom of table, and number that follows grid unit provenience in column 3 from left is depth in feet above Mulloy’s “0” line).
mixing. Lewis noted that on February 28, 1941, water was “pouring” over the cliff from above (due to a severe winter episode of freeze-thaw) and destroyed a hearth feature found in the S30/40E area (Lewis 1941:382). It is possible (likely) that water washed some artifacts from upper levels into lower levels of the cave. The time of year or season when an area was excavated and the particular unit location relative the cave’s drip line was directly correlated with the chances of unit and level mixing via water runoff over the ceiling of the cave. Lewis (1941:368) recorded a “Pinto Basin” (McKean complex) projectile 20 feet (6.1 m) from this area with a vertical elevation of 20 feet below the

Figure 4.7. Cave and excavation area from Mulloy (1958:25), showing recently obtained dates and areas from which recent radiocarbon samples were recovered.
Figure 4.8. Cave stratigraphy showing approximate areas and depths where radiocarbon samples were recovered and corresponding chronometric dates (note: Mulloy’s “0” vertical elevation shown on bottom right).

surface. Another broken “lanceolate point” was recorded at 20S/00W at an elevation of 20 feet (6 m) below surface (Lewis 1941:248). The other half of the point was subsequently found at 11S/37W, some 37 feet (11.2 m) to the west and one foot (30.4 cm) lower vertically in elevation. In addition, Oscar Lewis’ field notes continuously mention the disturbance of the cave deposits by packrats reflecting the ample opportunity for artifact displacement (Lewis 1941:7, 40, 53, 72, 84). Thus, it is evident that water and packrats were responsible for displacing many artifacts in the Pictograph Cave deposits. This type of bioturbation is common in rockshelter and cave sites in this region and elsewhere (Rapp and Hill 2006:100; Smyers 2012:62).

The radiocarbon dates of 3430 ± 30 $^{14}$C yr B.P. and 3600 ± 30 $^{14}$C yr B.P. (from 30S/40E and 30S/20E respectively, see Figure 4.7 and 4.8) were obtained from samples
located within six vertical inches (15.2 cm) of each other and from similar areas suggesting these dates are more likely from an area of only moderately disturbed cultural deposits. In addition, a shell bead, one of only two formed shell artifacts documented in Pictograph Cave, was found directly below the bone sample dated at 3430 ± 30 14C yr B.P. providing a minimal date for the use of articles of adornment at Pictograph Cave. Given that the aforementioned dates are from artifacts buried at least 18 feet (5.4 m) below the surface, they are surprisingly late in time and indicate that a large amount of sediment accumulated in Pictograph Cave over a relatively short period of time. By comparison, artifacts from similar depths at Mummy Cave in Wyoming were radiocarbon dated to 7190 14C yr B.P. (McCracken et al. 1978:49). However, the cultural deposit in Mummy Cave was formed in a limestone cave where sedimentation rates are far slower (Rapp and Hill 2006:83). Using radiocarbon data and sediment depth, Smyers (2012:55) calculated a sediment rate of .2 inches (.5 mm) per year for Horse Shoe Cave (24RB1011), a sandstone cave in southeastern Montana. Using this calculation, sediment would form at a rate of one centimeter every 20 years or one meter per 2000 years. At Pictograph Cave, over 20 feet (6 m) of sediment accumulated over 3820 years, a much faster rate than that suggested by Smyers. These exceedingly deep deposits certainly contributed to the long held notion that the occupation of the cave was quite ancient.

Three of the radiocarbon dates (2420, 3610, and 3820 ± 30 14C yr B.P.) from near the back wall of the cave as shown on the left in Figure 8 appear to be from in situ deposits since the dates that are progressively older are further beneath the ground surface. This area is also at least 15 feet (4.5 m) from the cave’s drip line suggesting the chances of water erosion and mixing is less likely. Although dates were derived from
deep cultural deposits, they are relatively recent in time. It is worth noting that this area of the site was excavated during the time when William Mulloy was the project director and the first trained archaeologist to supervise the excavations. During Mulloy’s tenure, Oscar Lewis (1941:371-453) continually referred to “troweling” as the excavation method whereas it was not mentioned previously in his field notes before Mulloy was the field director. With less shoveling and more troweling, provenience was apparently more precisely controlled (Schwab 1987).

Our radiocarbon analyses also includes one date (2420 ± 30 14C yr B.P.) which coincides with the Late Archaic period (3000 to 1500 years B.P.), two (1020 and 250 ± 30 14C yr B.P.) that fall within the Late Prehistoric period (1500 to 200 years B.P.), and one date (160 ± 30 14C yr B.P.) that reflects historic, post-horse use of the cave (Table 4.1, Figure 4.8). The 1020 ± 30 14C yr B.P. sample was provenienced to 20 feet (6 m) below the surface near the cave’s drip line, clearly indicating that is derived from mixed deposits. The most recent date of 16± 30 14C yr B.P., from a sample located seven feet (2.1 m) below surface, and below an artifact with a 250 ± 30 14C yr B.P. date, also indicate mixing by natural agents or by the WPA crew as part of their “horizontal stripping” of the cave deposits (see Figure 4.7).

While a relatively intense Middle Archaic to Historic period occupation is documented at Pictograph Cave, the apparent absence of Early Archaic and Paleoindian occupations as suggested by Mulloy (1958) is of interest. At least two scenarios are possible in explaining the discrepancy. First, inadequate sampling may be to blame for the lack of current radiocarbon dates earlier than 4000 years B.P. It is also possible that the presence of late Paleoindian “Yuma” and “Pinto Basin” projectile points in the lowest
levels of the cave reflect an early but poorly documented occupation, pre-dating 5000 years B.P. The “Yuma” point, which resembles a Scottsbluff (Cody complex) point based on the drawing shown in Mulloy (1958:33), is the sole indication of Paleoindian occupation. The projectile point classified as Pinto Basin by Lewis (1941:368) is morphologically similar to Duncan (McKean complex) projectile points. Given clear indications of stratigraphic mixing along the cave drip line, it is possible that a more deeply buried Paleoindian artifact was transported closer to the surface by rodent activity. In fact, Mulloy (1958:27) indicates that the bottom of the cave was never reached due to reaching the water table, so it is possible that much older occupations still exist within the cave.

A second and more plausible scenario is that radiocarbon dates from the lowest excavated levels of the cave, ranging in age between 3430 to 3820 ± 30 14C yr B.P., indicate that the oldest site occupants were Middle Plains Archaic period hunter-gatherers. The radiocarbon analyses conducted for this study yielded no dates from the Early Archaic or Paleoindian periods. Four of the dated artifacts were recovered from depths of between 17 to 21 feet (5.1 – 6.4 m) below the surface, similar to depths where putative Paleoindian projectiles were recovered by WPA workers. Thus, the presence of the “Yuma” projectile point in what appears to be a Middle Archaic (McKean) occupation may be the product of artifact curation by the cave’s occupants. A parallel example seems to be present at Horseshoe Cave (24RB1094) in southeastern Montana where a small Scottsbluff point was found in cultural deposits dating to 2163 ± 80 14C yr B.P. (Bonnichsen and Keyser 1982; Fisher 2010; McLean 1976; Smyers 2012). Although it is possible the Scottsbluff projectile point is associated with a yet to be detected
Paleoindian occupation, recent site testing at Horseshoe Cave failed to demonstrate this (Fisher 2010).

The existing projectile point collection from Pictograph Cave supports a Middle Archaic to Late Prehistoric period occupation of the cave. Over 150 projectile points were recovered from Pictograph Cave (Mulloy 1958), yet only 30 still remain in the collection at University of Montana-Missoula. A recent inspection (Scott) of these projectile points revealed that only 13 of the specimens include an exact provenience. The majority (17) contain the PC X symbol as designated by Oscar Lewis (1941:209) to signify artifacts whose exact provenience was unknown because they had fallen from upper excavation profiles or from areas where the excavations unit “side had caved down.” None of these points exhibit Paleoindian attributes. Five of the projectiles were recovered from 20 to 21 feet (6.1 – 6.4 m) below the surface and include indented base McKean style specimens, as well as both corner and Late Plains side-notched projectiles (Figure 4.9). Projectiles from near the surface include small side-notched varieties as well as larger corner notched (“Pelican Lake”) points. According to Mulloy’s chronology, these 13 specimens cross-cut the entire sequence of Pictograph Cave I-IV (six projectiles from level I, one from level II, five from level III, and one from level IV). In a larger context, the 50 projectile points illustrated in Mulloy (1958:33), are almost all exclusively Middle Archaic to Late Prehistoric period points.

The Middle Plains Archaic period, the apparent time when Pictograph Cave was first occupied, spans a time period of 5000 to 3000 years B.P. on the Northwestern Plains (Frison 1991; Kornfeld et al. 2010; MacDonald 2012). During this time period, archaeological site density increases between 25 to 50 percent over the preceding Early
Plains Archaic period (MacDonald 2012:74). A dense cluster of Middle Archaic sites are identified in southeastern Montana and northern Wyoming and contain a broad array of faunal remains including bison, deer, pronghorn antelope, and bighorn sheep. Approximately 13 percent of the rockshelter sites from eastern Montana and northern Wyoming date to this period (Table 4.2).

Indian populations likewise flourished during the Late Prehistoric period. Pictograph Cave was repeatedly occupied during this time. By then, bison hunting had emerged as a predominant subsistence focus (Frison 1991; MacDonald 2012). An abundance of prehistoric jumps, pounds, and traps are associated with bison procurement during this time period. Recent analyses of these hunting practices suggest they required a substantial social investment to successfully execute (Zedeño et al. 2014:24). The use of pottery also emerges during the Late Prehistoric period and mobility is amplified
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Table 4.2. Radiocarbon dates from 36 regional cave/rockshelter sites. Multiple dates for sites counted as only 1 per time interval.
Trade networks were widely established as reflected by exotic toolstone and Pacific Coast shells at numerous Northwestern Plains sites (Frison 1962, 1968; Husted 1969; Kornfeld et al. 2010; Mulloy 1958; Over 1936). In fact, an abundance of Pacific Coast shell items were found in neighboring Ghost Cave, including shell bracelets, beads, and amulets. The abundance of shell items in Ghost Cave led Lewis (1941:311) to suggest that shell processing and bead and jewelry manufacture were undertaken in the cave. Several scored long bones of small mammals, likely rabbits, were found in Pictograph Cave (Mulloy 1958:48), indicating that bead production was also carried out inside this cave as well. In addition, pierced teeth-- a human canine and an elk incisor-- from Pictograph Cave III (Mulloy 1958:60), may have been strung as part of a necklace or sewn on clothing. The significance of the human tooth worn as jewelry or adornment is compelling with regards to the relationship it reflects between the deceased and the adorned. Bone and antler gaming pieces found in Pictograph Cave (Mulloy 1958:48) are similar to those manufactured by Fremont groups in the Eastern Great Basin. These likely reflect trade and interaction with these groups. In fact, Great Basin style coiled basketry found in Ghost Cave, dating to 1371 ± 31 14C yr B.P., may indicate the site inhabitants were linked by a system of established trail routes to trading centers with Great Basin affiliation (Scott et al. 2014; Wood 1980). During this time, the production of perishable items including cordage, hearth sticks, and arrow shafts flourishes in Pictograph Cave III. Other Bighorn Basin sites nearby also reflect this trend (Frison 1962, 1965, 1968, 1976; 1991; Husted 1969; Kornfeld et al. 2010). These various attributes suggest the Late Prehistoric occupants of Pictograph and Ghost Caves had
become “settled-in” to this area of the pine parklands and maintained far-reaching trade contacts.

**REGIONAL COMPARISONS/DISCUSSSION**

Rockshelters and caves are widely distributed throughout southeastern Montana, Northwestern Wyoming, and adjoining regions of the Northwestern Plains. Within eastern Montana, of the over 7000 sites recorded, 84 sites are rockshelters or caves with the majority of these shelters occurring within sandstone formations (Aaberg et al. 2006:270). Over 130 rockshelters are currently known from the Bighorn Mountains in Wyoming, although only a portion has been scientifically excavated (Finley et al. 2005). The tally of rockshelters and caves from other areas of the Northwestern Plains is less precise, as research and cultural resource management projects add to this total each year (e.g., Finley et al. 2005; Munson 1993, 2003, 2004, 2005). The known rockshelters range in number from a few deep caves or shelters (Frison 1991; Finley et al. 2005; Husted and Edgar 2002; Mulloy 1958) to innumerable shallow shelters and overhangs (Aaberg et al. 2006; Munson 1993, 2003, 2005) in sandstone and limestone formations throughout mountain canyons and the pine parklands.

To date, over 200 individual radiocarbon dates are available from 36 investigated cave and rockshelter sites in Montana and Wyoming (Table 4.2). The dates are the result of 1960s-era salvage archaeological projects (Husted 1969), research at a few deeply stratified sites (Finely et al. 2005; Frison 1976; Husted and McCracken 2002), and projects driven by energy development on public lands (Munson 1993, 2003, 2004, 2005). The excavation of Pictograph Cave is a sharp contrast with these investigations, since they were completed as a Depression-era public employment project (employing
between 10-27 men) that lacked qualified professional oversight with the exception of the last year of excavation. The work was also conducted prior to the advent of radiocarbon dating.

The earliest regional evidence for rockshelter occupation is in the Bighorn Mountains in northern Wyoming (Table 4.2). A Folsom-age level in Two Moon Shelter (48BH1827) is dated to ca. 10,060 ± 60 14C yr B.P. (Finley et al. 2005). The deeply stratified Medicine Lodge Creek rockshelter (48BH499) contained early Goshen-age deposits dating to approximately 11,000 years B.P. (Frison 1976; Kornfeld et al. 2010). The early dates from Mummy Cave (48PA201) are slightly later, at approximately 9,000 B.P. (Husted and Edgar 2002). Sites such as Sorenson Rockshelter (24CB202) and Bottleneck Cave (48BH206) in Bighorn Canyon also yielded late Paleoindian and Early Plains Archaic period occupations (Frison 1991; Husted 1969), though these occupations are less intensive.

On the basis of regional site data, rockshelter use increased during the Middle Plains Archaic period, correlating with McKean, Pelican Lake, and other archaeological complexes (Aaberg et al. 2006). Rockshelter occupation peaked during the terminal Late Archaic and early Late Prehistoric periods, as reflected by an abundance of radiocarbon dates (Table 4.2, Figure 4.10). Many of these occupations, including Leigh Cave (48WA304), Pictograph Cave (24YL0001), and Wedding of the Waters Cave (48HO301), contain a wide array of artifacts and perishable items. Munson (1993) suggests that rockshelters in the pine parklands of southeastern Montana were used as base camps during the early Late Prehistoric period based on the diversity of artifacts and
features recovered. Later in this time period, Munson (1993:42) suggests that rockshelters were primarily used as task specific camps. Rockshelter use decreases by the Protohistoric period, after ca. 1700 A.D., probably reflecting, in part, the widespread use of horses and pole and tent shelters. Evidence from Pictograph Cave indicates it was used mostly as a base camp where a wide variety of tasks were carried out. Shaft abraders, ground stone chopping tools, bison metapodial hide fleshers, hafted knives and projectile points, bone and antler gaming pieces, and fire making tools are suggestive of the full gamut of daily life activities represented in the cave.

Broad interpretations of regional cave and rockshelter use by prehistoric populations are affected by sampling and the absence of excavation data. Nonetheless, it is clear that rockshelters were intermittently occupied throughout time and a linear pattern exists of increased use over time with a substantial peak during the terminal Late Plains Archaic and early Late Prehistoric periods (Figure 4.10). In Montana, a handful of
rockshelters contain Early and Middle Archaic components, including False Cougar Cave (24CB84), Janney Rockshelter (2424BH1117), and the Mangus (24CB221), and Sorenson (24CB202) sites. But the majority of known regional rockshelters date to later than ca. 4,000 years B.P., if not significantly later in time (Table 4.2). The occupation of Pictograph Cave appears to fit within this regional pattern.

The radiocarbon dates from rockshelter and cave sites shown in Table 4.2, peak between 2000 and 1000 years ago. Favorable climate conditions during the Scandic (ca. 1750 to 1400 years B.P.) and Neo-Atlantic (ca.1050 to 700 years B.P.) climatic periods (Bryson et al. 1970) may partly account for this significant increase in cave and rockshelter use. Specifically, cooler climatic conditions at approximately 2850 years B.P. were followed by the Medieval Warm period, approximately 1000 years ago (Viau et al. 2002:457). As various Plains researchers have noted (Brink 2008; Kornfeld et al, 2010; Peck 2011; Zedeño et al. 2014), this was an time of exceptional grassland productivity during the Late Prehistoric period which was highly favorable to ungulates, particularly bison. As a consequence, hunting as well as collecting opportunities increased, as evidenced by rockshelter occupations in the pine parklands of southeastern Montana and elsewhere (Figure 4.10; Aaberg et al. 2006; Kornfeld et al. 2010; Munson 1993).

Radiocarbon information from Pictograph Cave indicates a mostly continuous occupation from 3820 ± 30 14C yr B.P. up into the Historic period. Painted images of horses and guns and the very late radiocarbon date of 160 ± 30 14C yr B.P., indicate that Pictograph Cave continued to be used, likely by Crow Indian groups up into historic times. The radiocarbon date of 3430 years B.P. from 30S/40E, an area which appears to be relatively intact based on coinciding and depth consistent dates, lies just above a finely
made freshwater shell bead indicating that the groups living in the cave were adorning themselves and possibly making shell beads in nearby in Ghost Cave.

A variety of regional settlement models have been offered over the years for the eastern Montana and northern Wyoming region (e.g., Aaberg et al. 2006; Beckes and Keyser 1983; Deaver 1981; Fraley 1983; Munday 1982). The majority of these models correlate the variables of site density and site type with environmental factors (landform, ecotone, distance from water and lithic quarry sources, etc). A variety of researchers concluded that where site density is the highest is in areas where ecological and topographic diversity are the greatest (e.g., Deaver 1981; Fraley 1983; Munday 1982). Campbell et al. (1986) used optimal foraging theory to show how hunting, foraging, and site selection strategies evolved over the past 9,000 years based on survey and site testing data from Carter, Fallon, and Powder River Counties in Montana. Major shifts were identified over time including an increased use of base camps and a preference for lowland versus upland site use and occupation. Wettstaed (1990) proposed a co-influence sphere model for the pine parklands where the interaction between groups was the major factor in determining prehistoric land use patterns. He also suggested that the pine parklands were secondary and tertiary resource use areas for groups whose primary home or core area was elsewhere. Finally, Wettstaed (1990) proposed that the parklands received the heaviest use prehistorically between 3000 and 1000 years B.P. and that a variety of factors including elevation, water, slope, aspect, and soil type influenced site selection for prehistoric groups.

Pictograph Cave appears to fit the criteria of several of the environmentally-based models proposed for this area of south-central Montana. It lies in a favorable ecotone
that, no doubt, provided reasonable, if not easy access to various resources in the sandstone rim rocks and valley bottoms of both Bitter Creek and the Yellowstone River. Such resource access is reflected not only in the continuity of occupation but also by the wide array of perishable items recovered in Pictograph Cave.

However, a significant cultural factor influencing the occupation of Pictograph Cave from the Middle Archaic period up into historic times was surely its location and proximity to the Yellowstone River. The site is located approximately 2.5 miles (4 km) from the Yellowstone, a major corridor for prehistoric and historic travel and trade (Haines 1965:21; Scott et al. 2014:13; Zedeño et al. 2009:126). Prehistoric trade networks dating to the 11th century crisscrossed the Plains and linked groups from the Pacific Ocean to the Mississippi Headwaters (Manson 1998:386; Zedeño et al. 2009:123). William Clark noted an aboriginal trail following the Yellowstone River from its mouth clear to the Missouri Headwaters (Moulton 1993). From the confluence of the Missouri River and the Yellowstone, Indian groups followed footpaths to the Rocky Mountains, along the Missouri and Marias Rivers or along the Yellowstone River depending on tribal allegiances and territorial boundaries (Zedeño et al. 2009:122). For example, Hidatsa warriors followed the Yellowstone River through Crow territory whereas Assiniboine groups followed trail routes along the Missouri that crossed through Gros Ventre lands (Zedeño et al. 2009:122).

From a landscape perspective, over 3800 years, the occupants of Pictograph Cave held their own dynamic landscape constructions that changed as successive generations imposed their own cognitive map on the world. Because landscapes organize the form and structure of peoples’ activities, they serve as a historical text that evolves over time
(Anschuetz et al. 2001:163). In this sense, the occupational sequence in Pictograph Cave is best viewed as an evolving historical process (e.g., Prentiss 2011; Sassaman and Holly 2011). In deciphering how the cave was used, changing social dynamics on the Plains and subsequent shifts in how landscapes were used must be considered (e.g., Scheiber and Finley 2011). Trails, resource procurement areas, and base camp sites like Pictograph Cave were all part of various internal cognitive maps that contained a variety of essential environmental and cultural information (e.g., Aporta 2009:132). The above example of trail selection by Hidatsa and Assiniboiné groups based on interpersonal allegiances aptly illustrates this.

More specifically, as it flows eastward through Montana, the Yellowstone River is marked by a series of major tributaries including the Bighorn, Powder, and Tongue Rivers. Major river confluences were known collection points for groups to coalesce for the purpose of trade, information exchange and social interaction (Scott et al. 2014; Wood 1980; Zedeño et al. 2009). Further, these river drainages provided access to vast areas of southeastern Montana and to the Bighorn Basin in Wyoming. Archaeological research shows that these regions contain large numbers of rockshelter and cave sites (as well as other occupation sites) that were heavily used prehistorically (Aaberg et al. 2006, Beckes and Keyser 1983; Munson 1993). In this context, Pictograph Cave is bordered on the north by the Yellowstone River and on the south by Pryor Creek, another Yellowstone River tributary. Thus, Pictograph Cave was optimally located for hunter-gatherers traveling both east-west and north-south along these major river travel corridors. The rich deposit at both Pictograph and Ghost Caves and the many “exotic” artifacts both sites contained, including an abundance of shell beads and amulets, bone
and antler effigies and gaming pieces, and basketry, attest not only to their central location, but also to the fact that people living in these caves maintained contact with and had access to a variety of people from different culture areas.

The initial occupation of Pictograph Cave at approximately 3800 years B.P. is represented by a typical hunter-gatherer assemblage of stone and bone tools, and fire hearths. However, by the Late Prehistoric period, groups living in the cave were making bone beads, using gaming pieces and basketry, producing perishable items, painting abstract figures on the cave wall, and apparently burying or placing deceased individuals in the cave to make their journey into the afterlife. When combined, evidence from the cave deposits over the last 2000 years reflects an increase in social complexity and a relatively intimate knowledge of the local and regional landscape. In addition, evidence of shell processing and trade with Pacific Coast people is evident as well as contact and interaction with Great Basin groups. This multiethnic interaction clearly had an effect on the cave occupants and the subsequent historical processes that are reflected in their material culture (Zedeño et al. 2014:27).

In fact, William Mulloy was acutely aware of the central location and significance of Pictograph Cave and conducted surveys along Pryor Creek in search of connections with other archaeological sites. Oscar Lewis (1941:221) described Bitter Creek just below the cave as containing “a lot of habitation” based on his observations of the creek bank. Prehistoric sites found along Bitter Creek likely indicate travel back and forth from Pictograph Cave to the Yellowstone River which provided access to distant cultural areas via a series of well worn Indian trails. By historic times, the Coburn Stage Road was established just south of Pictograph Cave, along what was undoubtedly, a former Indian
“road.” These evolving travel corridors reflect the continued use and importance of the area, first to prehistoric hunter-gatherers whose culture became increasingly complex over time, and then later, to incoming Euroamericans drawn by the opportunities of the American West.

**SUMMARY AND CONCLUSIONS**

Our radiocarbon dating analyses of the Pictograph Cave deposits indicate occupation beginning in the Middle Archaic period and continuing up into historic times. The analyses also indicate that both intact and mixed cultural deposits were present inside the cave. Based on putative Paleoindian projectile points recovered in the excavations, it was assumed, that the lower most deposits would date to the Paleoindian or Early Archaic periods. However, the earliest date for Mulloy’s Pictograph Cave level I is 3820 years B.P. Slightly later dates were derived from level II located further out toward the lip or apron of the cave. Thus, a total of four dates from 3430 to 3820 ± 30 \(^{14}\)C yr B.P. correlate to the Middle Archaic period and represent, at present, the oldest dated occupation in the cave. Five radiocarbon dates correlate to the Late Prehistoric period. The most recent artifact date obtained, from Pictograph Cave III, is 1790 A.D., post dating the introduction of the horse. The age range of Pictograph Cave fits within the general pattern of dates from rockshelters and caves across southeastern Montana and northwestern Wyoming. The possibility still exists that a Paleoindian component is present at Pictograph Cave, but further sampling of the collection and more importantly, controlled excavation in the cave is needed to accurately make this determination.

The results of analyses conducted on the Pictograph Cave collection challenge long held assumptions about the site, particularly the antiquity of its cultural deposits and
the accuracy of the cultural chronology developed by Mulloy (1958). Thus, our chronometric data derived from the analysis could be viewed as diminishing the significance of Pictograph Cave. However, the information actually does the opposite by highlighting the site’s unique location on the landscape and its importance to prehistoric groups as they “settled” into the Yellowstone River basin. The study helps to hone in on Middle Archaic and Late Prehistoric period human interaction spheres and the importance of travel and trade networks as determinants of prehistoric settlement. Pictograph Cave was ideally situated for groups traveling both east-west and north-south along the Yellowstone River and its many tributaries in southeastern Montana. Ancient “road” networks connected with the region’s major river and were used for millennia by hunter-gatherers and then later adopted by European immigrants as they traveled along the Yellowstone River and across the Northwestern Plains.

This study of Pictograph Cave using WPA excavation data is also positive example of conservation archaeology and illustrates the value of revisiting old collections from important archaeological sites. Our study demonstrates the utility and significance of museum collection software and 3-D imaging in deciphering historic excavation records and to systematically select artifacts for analyses and chronometric dating. However, further radiocarbon dating should be conducted to affirm the findings of our study. Additional technical research is also needed on Pictograph Cave’s rich, but largely unstudied, perishable, faunal, shell, and chipped stone tool assemblages.
ACKNOWLEDGEMENTS

The authors are grateful to Montana State Parks, a division of Montana Fish, Wildlife and Parks for their overall support, appreciation of the significance of the research, and financial assistance with radiocarbon dating. Funding for radiocarbon dating was also provided by the Montana Archaeological Society and the Montana Department of Transportation. Carl Davis and Kelly Dixon reviewed drafts of the manuscript. Steve Aaberg shared insight and knowledge about the stratigraphy of Pictograph Cave. Bethany Campbell (University of Montana-Missoula) assisted with organization of and access to the Pictograph and Ghost Cave collections. Eric Carlson prepared all graphic illustrations.

The senior author appreciates the review comments and support of her doctoral dissertation committee at the University of Montana, Department of Anthropology, including Drs. Rafael Chacon, Kelly Dixon, Douglas MacDonald, Anna Prentiss and Richard Sattler.
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CHAPTER 5

SUMMARY AND DISSERTATION CONCLUSIONS

Over the last four years, three articles were prepared for professional publications based on research at Pictograph and Ghost Caves in south-central Montana and on the Buffalo Road Trail along the flanks of the Rocky Mountains, near Lincoln, Montana. The conclusions of each study are provided in detail in individual articles and therefore are summarized here according to topic. Final conclusions and a synthesis of the three articles follow.

ARTICLE SUMMARIES

Pictograph and Ghost Cave Perishables

The four Ghost and Pictograph Cave artifacts in our analysis of perishable items date to the Late Prehistoric period, between approximately 606 and 1650 years A.D. With the exception of the tinder stick, analogs for these specimens are found in a handful of dry caves in the Bighorn Basin of Wyoming and southeastern Montana (Finley et al. 2005; Frison 1962, 1965, 1968; Frison et al. 1986; Husted 1969; Husted and Edgar 2001; Kornfeld et al. 2010). The most unique and culturally diagnostic artifact in the study is the coiled basketry fragment from Ghost Cave. The item is believed to be part of a tray used for parching seeds and is indicative of seed processing in the cave. The artifact is virtually identical to Fremont-style basketry from the eastern Great Basin (Adovasio 2010; Adovasio and Andrews 1986; Adovasio and Pedler 1994). Because baskets were valued and thus, curated items, it is unclear how extensively basketry was used by the people living in this region of Montana. The artifact’s presence in Ghost Cave suggests that Fremont-like baskets were likely transported or traded (perhaps with other items such
as the Fremont-like gaming pieces) into this region from the northern periphery of the eastern Great Basin and Fremont area. Historic trading centers such as the Shoshone Rendezvous point in what is now southwestern Wyoming may have been a possible location for the exchange of such basketry items (e.g., Wood 1980).

The dating of perishable objects from Pictograph Cave provides chronological reference points for these artifacts, all from the Pictograph Cave III level, the richest occupation level in the cave (Mulloy 1958:51). The dates document the presence of intense (multiple and repeated) Late Prehistoric period occupations in both caves. For this study, we had hoped to correlate items such as the paint applicator with painted figures on the wall of Pictograph Cave and the use of the tinder stick with the hearth stick. However, the dating analyses indicated that these items were not contemporaneous in time.

In sum, decades of archaeological survey conducted in south-central and eastern Montana have continually failed to locate rockshelters or caves the size of Ghost and Pictograph Caves, emphasizing their uniqueness in this region. Their artifact collections are worthy of extensive analysis and reporting, regardless of their problematic WPA provenience and condition. On the basis of our study, it is clear that perishable artifacts expand our understanding of aboriginal technology, subsistence, and ethnicity on the Northwestern Plains. The dated perishable objects highlight activities not often documented at Northwestern Plains archaeological sites and provide a more accurate and realistic picture of Late Prehistoric tool repertoires in their entirety. Knowledge gained through the study of perishable items allowed Montana State Parks to expand its site interpretation of ancient American Indian lifeways at the caves for park visitors.
Pictograph Cave Cultural Chronology

The initial study of select perishables items from Pictograph and Ghost Caves spurred the subsequent chronological study. The second radiocarbon dating analyses of the Pictograph Cave deposits indicated that prehistoric occupation began in the Middle Archaic Period and continued up into the Historic period. The analyses revealed that both intact and mixed cultural deposits were present inside the cave. Based on putative Paleoindian projectile points (4) recovered in the excavations, it has long been assumed that the lower most deposits dated to the Paleoindian or Early Archaic periods (Mulloy 1958:31). This assumption is contradicted by my analysis. The earliest date for Mulloy’s Pictograph Cave level I, as derived from this study, is $3820^{14}C$ yr B.P. Slightly later dates were derived from level II located further out toward the lip or apron of the cave. Thus, a total of four dates from $3430$ to $3820 \pm 30^{14}C$ yr B.P. correlate to the late Middle Archaic period and represent, at present, the oldest dated occupation of the cave. Three radiocarbon dates correlate to the Late Prehistoric period. The most recent artifact date obtained, from Pictograph Cave III, is $160^{14}C$ yr B.P., post-dating the introduction of the horse. The age range of Pictograph Cave fits within the general pattern of dates from rockshelters and caves across southeastern Montana and northwestern Wyoming (Aaberg et al. 2006; Frison 1991; Kornfeld et al. 2010; Munson 1993). The possibility still exists that a Paleoindian component is present at Pictograph Cave, but further sampling of the collection and more importantly, controlled excavation in the cave is needed to accurately make this determination.

This study of Pictograph Cave using WPA excavation data is a positive example of conservation archaeology and illustrates the value of revisiting old collections from
important archaeological sites. Our study demonstrates the utility and significance of museum collection software and 3-D imaging in deciphering historic excavation records and in systematically selecting artifacts for analyses and chronometric dating. However, further radiocarbon dating should be conducted to affirm the findings of our study. Additional technical research is also needed on Pictograph Cave’s rich, but largely unstudied, perishable, faunal, and chipped stone tool assemblages.

The results of analyses conducted on the Pictograph Cave collection challenge long held assumptions about the site, particularly the antiquity of its cultural deposits and the accuracy of the cultural chronology developed by Mulloy (1958). The study highlights the site’s unique location on the landscape and its importance to prehistoric groups during the Middle Archaic and Late Prehistoric periods. Its recurrent occupations are indicative of human interaction spheres and the importance of travel and trade networks as determinants of prehistoric settlement. Ancient trail networks are documented along the Yellowstone River and Pictograph and Ghost Caves are situated less than two and one half miles (4 km) from the Yellowstone River, a major nexus of prehistoric trade and travel (Haines 1965; Moulton 1993; Wood 1980; Zedeño et al. 2009). Thus, Pictograph Cave was ideally situated for groups traveling both east-west and north-south along the Yellowstone River and its many tributaries in southeastern Montana. Ancient “road” networks in this region were used for millennia by hunter-gatherers to access Pictograph Cave and were then later adopted by European immigrants as they traveled along the Yellowstone River and across the Northwestern Plains.
Buffalo Road Trail

My investigation of the Buffalo Road Trail demonstrates that Indian groups were using the trail for centuries as a means to access buffalo hunting grounds on the Northwestern Plains east of the Continental Divide of the Rocky Mountains. The study included the identification of intact trail tread and numerous prehistoric and historic sites along it including prehistoric lithic scatters, stone forts, rock cairns, and a stone cross feature.

Prehistoric campsites found at the base of the Continental Divide and on top of it reflect the ancient tradition of buffalo hunting on the Plains and the trail’s long use. Lichen analyses of stone features along the trail indicate they were built between 1344 and 1941 (Hall 2005; Hall et al. 2006; Scott 2001). The stone structures found at the top of Lewis and Clark Pass appear to be forts or defensive structures as indicated by the Salish and Pend d’Orielle place name of Smítu Sxʷucwísí or “Indian Fort Pass” (Salish-Pend d’Orielle Culture Committee 2003). These fort structures date between 1344 and 1655 years A.D. on the basis of lichen analyses, thus predating the horse and Euroamerican settlement (Hall 2005:29). The forts are likely indicative of both warfare and conflict over resources and territory as indicated by other studies (Moss and Erlandson 1992; Schaepe 2006). The numerous rock cairns identified along the trail mark its location, likely made the trail smoother and easier to travel, and possibly offered travelers a respite to stop and pray or a means to make an offering for a safe journey (e.g., Fowler 2009; Loendorf and Brownell 1980).

The unique stone “Celtic” cross documented near the crest of Lewis and Clark Pass is believed to be constructed by Nicolas Point in 1842 based on his diary notes and
on lichen analyses (Hall 2005:32; Point 1967:174). The cross signifies the arrival of missionaries or “black robes” and their attempt to convert Indian groups to Christianity. It also indicates that missionaries left religious icons to mark their passing as a means to ensure spiritual protection and safe passage for their journey and as a way to spread the word, through a symbolic icon, of their religion.

Through the use of the direct historical approach, a continuum of travel was revealed for the trail, beginning with treks by unknown prehistoric groups, then by Salish, Pend d'Orielle, and Nez Perce bison hunters, and finally by early trappers, explorers and missionaries. For various Indian groups, buffalo provided not only subsistence but robes, skins, and dried meat for exchange and barter (Ewers 1968; Fahey 1974; Haines 1955; Turney-High 1937). The cultural landscape of the trail and its sites and features comprise an entire window of human use and changing social dynamics (e.g., Lightfoot 1995). The trail itself likely became a home of sorts for many Indian groups and was deeply embedded in their subsistence economies (Aporta 2009). It also played a critical role in providing access to and maintaining an array of trading relationships and social networks which were highly dynamic and continually evolving (Farr 2003; Wood 1980).

In a broader perspective, the presence of Pacific Coast shells in Middle Missouri sites and at sites like Ghost Cave in south-central Montana, as well as the presence of Knife River flint from the Dakotas in Paleoindian sites in Colorado prove the existence and antiquity of prehistoric trade. Major trading centers existed at The Dalles along the Columbia River, in the Dakotas at the Mandan/Hidatsa Center, and at the Shoshone Rendezvous point in southwestern Wyoming (Ewers 1968; Wood 1980). In order for items to be traded, specific routes were taken that connected these places. Trails provided
the link for the transfer of goods across large expanses of space. Ethnographic studies and the journals of early explorers coupled with archaeological data, document the importance of trails as pipelines for the diffusion of a vast array of items and undoubtedly, information exchange, mating, and social interaction (Farr 2003; Wood 1980; Zedeño et al. 2009).

After the horse was introduced between 1730 to 1750, (and probably at least a hundred years or more before), the trail was traversed by raiding parties of Blackfeet, Crow, and others who crossed the divide to raid the camps of western Indian groups (Ewers 1958, 1968; Fahey 1974; McGinnis 1990). During this time, Salish-Pend d’Oreille groups built stone forts (Smítu Smítu’su) on top of the divide to hide behind and watch for enemy parties (Salish-Pend d’Oreille Culture Committee and Elders Cultural Advisory Council 2005). Use of the trail and the constant journeys back and forth across the divide portrayed in ethnographies and historical documents breathe life into the prehistoric nomadic world which is most often depicted merely from the perspective of stone tool use.

Trail travel was essential to the earliest inhabitants of the Americas. Colonizing new land and unknown spaces represented both opportunity and potentially, tremendous risk (Golledge 2003; Kelly 2003). But as hunter-gatherers, movement was of course, essential. Thus, as new areas were explored and incorporated into the seasonal round, information about them concerning resources, stories, narratives, and rituals were passed down between generations (Aporta 2009; Oetelaar and Meyer 2006; Zedeño et al. 2009). Routes of travel between points were established and reused and landmarks along the way were named. As populations flourished on the Plains in the Late Prehistoric period,
former territory boundaries shifted and the social dynamics along well established routes of travel changed as well. As enemies and alliances formed, travel became less open-ended and at times, longer routes were selected to avoid passing through areas of high social risk for fear of reprisal (Farr 2003; Moulton 1993; Zedeño et al. 2009).

A landscape-based approach to the trail guided documentation and analysis of the Buffalo Road, and it is now understood to be a dynamic cultural feature imbued with stories and myths linked to and captured by place names (“Smìtu Sxʷcuwil” or “Indian Fort Pass”) for a variety of geographical landmarks. Place names for landscapes and landmarks served as mnemonic pegs that anchored collective group knowledge through stories and myths that were (and still are) critical to group identity and social cohesion (Anschuetz et al. 2001; Oetelaar and Meyer 2006; Zedeño 2000; Zedeño et al. 2009).

Although the Buffalo Road Trail was long used by indigenous Indian groups, its fame and notoriety come from its association with the Lewis and Clark expedition, though the party spent less than four days traveling its 74.5 mile (120 km) length and William Clark never saw it. Ethnographic information, oral histories, and historical documents expose the layers of trail use over time. Although tribal people often view the Lewis and Clark expedition as a reconnaissance for the invasion of their land, were it not for Lewis and Clark who meticulously studied the trail they followed and used sextants and compasses to carefully document the path, the documentation and subsequent protection of sites along it would have been much more difficult. Although some view the commemoration of the Lewis and Clark expedition as a reflection of lingering colonialism, the study undertaken here portrays Lewis and Clark as a piece in an
enormous puzzle of tribal travel, trade, warfare, and social interaction overlain by the spread of European religions and the exploration and development of the American West.

**DISSERTATION CONCLUSIONS: TIES THAT BIND**

**Research Connections**

The three research articles that comprise this dissertation span the Northwestern Plains Middle Archaic and Late Prehistoric periods, and both Pictograph Cave as well as the Buffalo Road were used as late as the last few centuries (Mulloy 1958; Scott 2001). Pictograph Cave contains pictographs of horses and guns demonstrating its use during the relatively recent past, and the Buffalo Road bears iconic remnants of Euroamerican missionaries working to convert Salish Indians to a Christian form of worship as they traveled to the Plains to hunt buffalo. Within this broad time frame, the research conducted focused on cultural chronology, prehistoric trade and exchange, and the landscape context of ancient travel routes.

During the Middle Archaic period on the Northwestern Plains and far eastern Plateau, Indian groups used distinctive projectile points including McKean Complex, Pelican Lake, and other notched and stemmed styles, all of which are present at Pictograph Cave. Radiocarbon dates from the cave coincide with the time frames associated with these projectile point styles. A similar range of Middle Archaic to Late Prehistoric period sites are found across eastern Montana and along the Blackfoot River and its tributary, Alice Creek, which parallels the ancient Buffalo Road (Bodily 2014; Ferguson 2002; Knight 1989; Lahren 1997). During the Middle Archaic an increasing emphasis on communal bison hunting occurred as the drier climate of the Altithermal gave way to cooler wetter Medithermal conditions based on world-wide pollen records.
beginning about 4,500 years ago (MacDonald 2012:74). Large numbers of bison kills are found along the Rocky Mountain front that date to these time periods, including Ulm Pishkun and the Risley bison kill site (Aaberg et al. 2009; Fisher 1995; Keyser and Knight 1976).

Plant food collecting and processing also increased during this time as evidenced by much higher numbers of manos and grinding slabs at archaeological sites from various parts of the Northwestern Plains, including Pictograph Cave (e.g., Keyser 1986; Kornfeld et al. 2010; Loendorf 1980; Mulloy 1958). An abundance of macro-botanical remains were present in Pictograph Cave (Baker 1989), but the historic excavations did not allow for recovery of small perishable plants or seeds as one-quarter inch and half-inch mesh screens were used to recover archaeological materials. Later ethnographic evidence focused on trail use indicates that plant collection locations, as well as toolstone quarry sources, were important to people traveling along the region’s trail systems (e.g., Aporta 2009; Malouf 1980; Zedeño et al. 2009). As one example, large camas fields still exist today along the Alice Creek drainage some six miles (10 km) south of the Continental Divide and were a known important commodity to Salish Indians as well as other tribes (Fahey 1974; Haines 1955; Turney-High 1937).

An abundance of chert toolstone quarries are located along the Blackfoot River and in the Avon Valley just to the south (Bodily 2014; Napton 1965). Based on the projectile points collected and recovered along the trail, a wide variety of chert, basalt, and obsidian was used to produce stone tools. High quality chert quarries in the Avon valley were undoubtedly a marked destination for Archaic and Late Prehistoric period travelers (e.g., Platt 2011). Among the projectile points in the Pictograph Cave collection
at the University of Montana, a wide array of toolstone is also present, including a variety of chert and obsidian. Basalt or dacite projectile points are less common in the two caves and suggest that Blackfoot River travelers utilized this toolstone more heavily (as it was likely more readily available) than the occupants of Pictograph Cave (e.g., Bodily 2014).

Unfortunately, during the Pictograph Cave excavations, only formed tools were collected, and chipped stone debitage was left in back dirt piles, so a true picture of toolstone variety is unavailable.

On the Northwestern Plains as well as on the Columbia Plateau and many other culture areas, including the Southwest and the Eastern Woodlands, Indian populations grew considerably as reflected by the higher density of archaeological sites by the Late Prehistoric period (Kornfeld et al. 2010:125; MacDonald 2012:95). This time period coincides with the introduction of the bow and arrow which provided a better advantage in hunting (i.e. concealment) and possibly for raiding and warfare. The time period is also marked, at least initially, with climatic conditions that were far more favorable for grassland production (animal forage) as well as presumably edible plants used by native groups (Zedeño et al. 2014:26). Sites along the Blackfoot River increase in number during this time as evidenced by an abundance of Late Prehistoric period projectile points (Aaberg 1985; Ferguson 2002; Knight 1989; Lahren 1997; Napton 1965; Scott 2001). At Pictograph and Ghost Caves, artifact densities also significantly increased during this time (Mulloy 1958:51). The entire deposit within Ghost Cave was believed to date from the Late Archaic to the Late Prehistoric period (Mulloy 1958:90). Over 600 projectile points were recovered in Ghost Cave, leading Schwab (1987) to propose that the cave
was used as a staging area, possibly associated with the Billings Bison Trap, now home to the Billings Metronome (Dave Schwab, personal communication 2014).

Zedeño et al. (2014) recently suggested that increased bison herds during the Late Prehistoric and a focus on complex strategies to lure and align herds so they could be effectively dispatched, resulted in an increase in social complexity. Hunters traveling the trail, as well as those living in Pictograph Cave, planned and executed massive bison kills that required group coordination and cooperation to ensure successful results. Indeed, large campsites along the Buffalo Road at the base of the Continental Divide and on top of it include predominantly Late Prehistoric period projectiles, suggesting use of the trail intensified during this time (Ferguson 2002; Knight 1989; Lahren 1997; Scott 2001). More intensive trail use heralded increasing numbers of people on the Plains and resulted in an amplification of inter-ethnic interaction which also enhanced and helped foster an increase in social complexity (Zedeño et al. 2014:27).

At Ghost Cave, the presence of a basketry fragment dated to 1371 years B.P. indicates ethnic ties to the Fremont culture of the Eastern Great Basin and suggests that the cave occupants either traded with this group likely through ties to the Shoshone Rendezvous Center in what is now southwestern Wyoming or that the cave itself was occupied by Fremont groups who were likely pushed out of the Great Basin by severe droughts that occurred around 1200 years A.D. (Sutton and Rhode 1994:15). Bone gaming pieces similar to those found at Fremont sites were also found in Pictograph Cave, giving further support to a Fremont-Northwestern Plains connection. Other evidence of Fremont presence in this area includes rock art at one site, with distinctive a necklace displayed on a image that is similar to characteristic Fremont figures; in
addition, a slab lined hearth at another habitation site was used to document a purported Fremont presence on the Plains (Greer and Greer 2007; Hadden 2008). Whether these sites represent a Fremont influence on Plains Indian cultures through inter-ethnic interaction along well established trails and at trading centers along major rivers or if they reflect the presence of Fremont populations using these sites, remains an interesting but little explored archaeological research question. Regardless of who was responsible for leaving these archaeological traces, radiocarbon dates on perishable artifacts from Pictograph Cave indicate that it was continually occupied throughout the Late Prehistoric and (Protohistoric) period suggesting this location was highly favorable from a resource perspective (likely including plant foods as well as animal resources) and hence, attracted Indian groups over a relatively long period of time.

Stone forts located on the Continental Divide along the Buffalo Road Trail are believed to have been used as early as 1344 years A.D. based on lichen dating and likely represent archaeological evidence of territoriality and wayfinding. Traditional Salish names for the divide in this area further suggest that conflicts over territory occurred at least beginning 600 years ago and possibly earlier. Other investigations along the northern Pacific Coast and along the Upper Fraser River, suggest that stone fortifications were common as far back as 1000 years A.D. and represented conflict over territory and the assertion of power, authority and control over others (Moss and Erlandson 1992; Schaepe 2006). Zedeño et al. (2014:28) suggest that during favorable climatic conditions over the last 2000 years, bison herds congregated on the eastern foothills of the Rocky Mountains and that for the Blackfeet, control and ownership of these herds was paramount, providing individuals with enormous prestige and access into specialized
bundle groups and societies. As a result, disputes over ownership of bison herds ensued, pitting ethnic groups including the Salish and Blackfeet against one another and giving rise to the all out warfare that occurred during the past few centuries (Farr 2003:5). As Meriwether Lewis followed the Buffalo Road in July of 1806, his journal entry that the group was “on its guard both day and night” as they neared the Continental Divide reflects the hostile environment that the margins of bison territory had become (Moulton 1993:96). Missionary Nicolas Point (1967:174) also expresses a similar tension in 1842, when he recorded in his diary that as his group crossed the divide, he “made and planted a cross…for we were in the middle of Blackfoot Country.”

On the Northwestern Plains, bison were critical not only for subsistence but also as an important commodity for trade as bison robes, clothing, and items made of horn and bone were especially valuable (Ewers 1968; Haines 1955; Wood 1980). The fact that bison robes have been recovered from Puebloan sites in the Southwest shows their value and the extent that such items were traded locally and regionally (Creel 1991; Manson 1998; see also Flores 1991). Salish groups living between the Plains and the Pacific Coast had a particular advantage in being the intermediaries between highly valued items from both locations including dried salmon from the Columbia River. Orchestration of successful bison drives certainly contributed to increasing social complexity as Zedeño et al. (2014) suggest, but procurement of items for trade and the inter-ethnic interaction that occurred as trading partnerships were developed among various groups was also a contributing factor to increased social complexity. Clearly, the amount of bison taken by the Salish, with robe sales jumping from 26,000 over a 15-year period (1815 to 1830), to 70,000 robes over an eight-year period (1845 to 1853), reflects that bison wealth had
become an influential form of power and prestige among Montana’s various Indian groups (Fahey 1974:168; Zedeño et al. 2014:28).

Between 1300 and 1500 years A.D., Crow populations migrated from the Mandan-Hidatsa villages in North Dakota into Montana (Brooks 1995; MacDonald 2012). Although the exact timing is disputed, Shoshonean populations (Numic speakers) migrated from the Great Basin at approximately the same time into the Northwestern Plains (Aikens and Witherspoon 1986; Greiser 1994). This population movement is reflective of a trend that likely began prior to this and continued well into the Historic period. A variety of reasons for the migration are proposed with a complex interplay of climatic conditions, population expansion, and changes in procurement and storage strategies being the most widely supported (Bettinger 1994:54; Sutton and Rhode 1994:15). As both resident and newly arrived Indian groups on the Plains such as the Northern Shoshone acquired horses and guns in the early 1700s, they were able to push previous occupants out of areas into new zones and into the traditional homeland of others (Greiser 1994; Hämäläinen 2003, 2010; see also Brooks 1995, 2002; Sunseri 2009). As a result, the exact timing of ethnic arrivals and departures on the Plains is complex, making efforts to define and reconstruct the Protohistoric period challenging.

At Pictograph Cave, the final stages of occupation appear to be affiliated with both Shoshonean and Crow groups as evidenced by over a thousand Crow and Intermountain Ware pottery sherds found in sparse quantities in the cave and predominately in Empty Gulch below (Mulloy 1958:82-84). Crow groups clearly knew of Pictograph Cave as reported by McCleary (2008:64), who suggested that they avoided the cave in recent times because they believed the paintings were created by spirits from
whom they wanted to keep their distance. Crow men purportedly visited the caves in preparation for battle and could see the outcome of their venture when they visited the cave. Today, Crow tribal members are often called upon to offer prayers and blessings as part of state park projects, events, and celebrations. Incorporating tribal views and perspectives on the significance and meaning of places and landscapes such as those presented herein is essential for agency cultural resource managers and decision-makers and for North American archaeologists in general (e.g., Llobera 2007).

In this dissertation, the Buffalo Road Trail was examined from a landscape perspective which helped to link features found along it. From a resource protection perspective, this linkage is critical to the preservation of whole landscapes encompassed by significant heritages sites (Zedeño et al. 1997:123). Pictograph Cave was also examined from a landscape perspective in terms of where it fits in a broader locational context on the Northwestern Plains. The cave is located just over two miles (4 km) from the Yellowstone River which was a major, historically-documented travel corridor (Haines 1965; Zedeño et al. 2009). The path from the Yellowstone to Pictograph Cave along Bitter Creek is marked by an abundance of habitation sites that were documented by Oscar Lewis (1941:221). Given the landscape positioning of Pictograph and Ghost Caves, the site inhabitants clearly had access to a number of other ethnic groups who traveled the Yellowstone trail to major resource procurement destinations and trading networks along the river. In this sense, the Buffalo Road Trail and Pictograph Cave share similarities in that trade and inter-ethnic connections are associated with each of them, both giving rise to an increase in social complexity. Moreover, the Buffalo Road Trail study included an examination of human agency and how pre-contact populations dealt
with opportunities and obstacles as they traveled along this linear feature. The segment of the trail examined was a critical last leg that led to bison herds on the Plains, making it a territorial landscape that not only connected but divided Indian groups in this area. Stone forts on top of the divide known to Salish groups mark the pass as contested territory.

For both the Buffalo Road and Pictograph Cave, evidence suggests that beginning in the Middle Archaic there was a gradual shift towards an increase in human populations evidenced in the archaeological record in both locations. By the Late Prehistoric period, both the trail and the two caves were much more heavily and frequently used. By the period of transition associated with European settlement, there were clear shifts in the use of trail. It was no longer a trail used exclusively by Columbia Plateau people; rather, it also came to be used by other Plains groups including the Blackfeet, Crow, and Hidatsa who ventured over the mountains to raid and capture horses from western Indian encampments (Fahey 1974; Farr 2003; McGinnis 1990). Given this shifting use, Salish, Nez Perce and Pend d’Oreille groups banded together for defensive purposes as they traveled eastward on the trail (Farr 2003:7). By the 1800s, along the Yellowstone and Missouri Rivers, Indian groups specifically selected travel routes based on their relationship and affiliation with other resident tribes reflecting the nuances and complexity of inter-tribal relationships during this time (Zedeño et al. 2009:122).

**Research Contributions**

Radiocarbon dates from Pictograph Cave suggest its earliest occupation was during the Middle Archaic period which currently contradicts earlier interpretations by Mulloy (1958) that the site was first occupied during the Paleoindian period. This refinement of the cave’s chronology using modern analytical tools unavailable when the
The site was excavated represents a significant research contribution to Montana and Northwestern Plains prehistory. Further, perishable items are rarely preserved in the archaeological record here and extant collections are often poorly documented, making the dating and analysis of perishable items from the Ghost and Pictograph Cave collections critical to understanding the vast array of tools used by Plains hunter-gatherer groups. Analysis and dating of items from the two caves therefore provides important insight into a range of human activities that archaeologists working in this region are rarely able to study. For example, as demonstrated by studies of Great Basin caves, perishable items such as basketry reflect gender-related subsistence activities that can rarely be inferred from lithic assemblages alone.

Deep and well preserved caves containing perishable assemblages like Pictograph and Ghost Caves are an extremely finite resource across Montana and the Northwestern Plains. Archaeological surveys and CRM investigations over the last 20 years have failed to produce sites of this size, quality, and content. As a result, a re-examination of artifact collections from these caves and a handful of others (e.g., Spring Creek, Medicine Lodge Creek, and Daugherty Caves in Wyoming) is especially critical from a research perspective since similar sites are unlikely to be identified in the future. This study is an excellent example of conservation archaeology where rather than excavating new sites, my focus was to re-examine the artifact collections and associated records of previously excavated sites in order to address relevant research issues such as cultural chronology, trade and travel. An abundance of information about the lifeways of Plains Indian groups is still attainable through additional analyses of these collections. This dissertation will hopefully guide and encourage future researchers along similar lines of study.
The basketry fragment from Ghost Cave and the bone gaming pieces from Pictograph Cave show affinities with the Fremont culture in the Great Basin and document contact or trade between the Northwestern Plains and the Great Basin, a topic nominally discussed in Plains prehistory beyond lithic toolstone, and to a lesser extent, ceramic distributions. Future surveys and site investigations may reveal additional sites (or collections) that either support or discredit the presence or influence of Fremont groups on the Northwestern Plains. From a regional perspective, the dissertation study points to the close similarities between the archaeological sites and material culture of southeastern Montana with those in the Bighorn Canyon region of north-central Wyoming.

In a related context of trade and travel, research conducted along the Buffalo Road demonstrates this linear landscape was heavily used at least 1000 years ago and likely longer and that its use continued during the period of European colonization. Given their significance, it is unfortunate that ancient trail systems are an infrequently studied research topic for the Northwestern Plains and Intermountain regions (Snead et al. 2009:2). Nomadic Plains and Columbia Plateau hunter-gatherer bands depended on such trails, and traveled on known, well worn “roads” for their livelihood. Investigation of the Buffalo Road Trail demonstrates its antiquity of use and its role in maintaining trade and social networks among diverse aboriginal groups. From a landscape theoretical perspective, trail studies allow for an analysis of patterning both within place and between place contexts, which is especially important as the region’s indigenous peoples’ lives encompassed whole landscapes—not simple singular sites—and were the arena for economic, social, and ideological activities (Binford 1983:109). Trails and place names
for locations along them were infused with an array of environmental information and stories of previous journeys (Aporta 2009:132; Zedeño et al. 2009:111). In this sense, landscape knowledge and resulting “place-worlds” continuously changed and evolved as new experiences formed with each journey. Stories linked to the trail connected travelers to their ancestors and reinforced group identity, underscoring the importance and value of these heritage resources (Oetelaar and Meyer 2006:370). In his study of Inuit trails, Aporta (2009:136) indicates that place names along trail routes included descriptions of the horizon of particular areas—an absolutely critical tool for wayfinding. He also discusses the Inuit reluctance to create maps on paper because the static maps transformed what was inherently a dynamic and ever-changing process into a fixed state. Oral history information, such as that provided for the trail study by the Salish and Pend d’Oreille, was critical to interpreting archaeological sites and features and offered insight into tribal world views and past social and economic conditions. Unfortunately, oral history information is infrequently sought from indigenous people and rarely used as an interpretive tool in Northwestern Plains archaeology. However, positive examples exist herein and elsewhere and hopefully these will guide future research (e.g., Aporta 2009; Schaepe 2006; Zedeño et al. 2009, 2010, 2014).

In addition to the above contributions, the three research articles elevate CRM-related studies and agency interpretative material (“grey literature”) into professional archaeological journals where the information is available to Northwestern Plains and Intermountain researchers. As a Ph.D. dissertation, the three research projects transcend the division between “prehistoric” and “historical” archaeology, thus providing the type of essential broad spectrum knowledge required by any professional working in a CRM
or agency related capacity (cf. Lightfoot 1995). The research conducted also bridges the “divide” between academic and applied archaeology, underscoring the value and potential of CRM-based projects.
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